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FY2001 GLI Workshop Minutes

November 14 – 16, 2001
Triton Square
Tokyo, Japan

Prepared by: TNK Space Corporation

Change History

Date	Revision	Changes incorporated
16 November 2001	Original	

Meeting: ADEOS-II GLI Workshop 2001
Place: Triton Square, Tokyo, Japan
Dates: November 14th – November 16th, 2001

Action Items:

(1) NASDA EORC will make the GLI performance data available to GLI-PIs.
(2) NASDA/GLI calibration team will provide in-band irradiance data for the effective GLI channels and a survey of irradiance models for channel 30.
(3) NASDA will coordinate with PIs and data providers about the In-situ data distribution form proposed by Dr. Asanuma.
(4) NASDA will investigate a protocol and format for query of data transfer from in-situ data providers
(5) NASDA will provide a list of points of contact with regard to software support/ distribution.
(6) NASDA will investigate an efficient mechanism or arrangement for PIs to perform calibration/validation activities.
(7) NASDA will study more details on the following issues:
- Sensitivity decay over saturation range: flagging
- Reflectivity/Polarization sensitivity vs scan angle
- Stray light/BT recovery

(8) NASDA will conduct further surveys and investigate the better coverage of GLI 250m.
(9) NASDA will investigate the scientific result of the L1 simulation test.
(10) NASDA will investigate GLI standard extra-terrestrial irradiance on (1) spectrum for $\lambda > 3$ µm and (2) response function-weighted irradiance.
(11) NASDA will investigate the possibility of some temporary files transfer (4 day minimum radiances, Atmospheric L2A-segment) from EOC to EORC.
(12) NASDA will identify the contact point to communicate with PIs and collaborators on EORC data availability.

Agenda and Handouts:

Day 1 (November 14, 2001)

Overviews

1. Opening address (Prof. Teruyuki Nakajima, University of Tokyo)
Handout: None

2. Words from NASDA

2.1 ADEOS-II Program Scientist Dr. Sumi (Dr. Sumi)
Handout: None

2.2 NASDA/EORC Director Mr. Otsuki (Mr. Otsuki, NASDA)
Handout: None

2.3 ADEOS-II Science Project Manager Mr. Matsuura (Mr. Matsuura, NASDA)
Handout: None

3. Science Activities Report (GLI PI Team Leader Dr. Teruyuki Nakajima, University of Tokyo)
Handout: GLI Science Activities Dec 2000-Nov 2001 (Prof. Teruyuki Nakajima, The Univ. of Tokyo)

4. ADEOS-II Status Report (Mr. Ishida, NASDA/SPPD Deputy Director)
Handout: ADEOS-II Program Status (NASDA Mr. Ishida)

5. GLI Project Status Report (Mr. Matsuura, ADEOS-II Science Mission Manager)
Handout: ADEOS-II Science Project Status (NASDA Mr. Matsuura)

6. GLI Sensor Development Report (Mr. Tanaka, NASDA ADEOS-II Project (Sensor Development))
Handouts:
(1) GLI Sensor Development Status (NASDA Mr. Tanaka)
(2) GLI Mission Data Evaluation Test Results (NASDA Mr. Tanaka)

7. A Ground Processing System Report (Mr. Ikejo, NASDA/EORC-WTC)
Handout: Not available at the time these minutes were created.

8. GLI 250 Data Acquisition (Mr. Matsuura, ADEOS-II Science Mission Manager)
Handout: GLI-250m Data Acquisition Analysis (NASDA Mr. Matsuura)

9. To acquire more GLI-250m global (Ms. Miura, NASDA/EORC/EOC-Hatoyama)
Handout: To acquire more GLI-250m global data <Technical Study> (NASDA Ms. Miura)

10. EOC Data User Service (Mr. Fukui, NASDA/EORC/EOC-Hatoyama)
Handout: EOC Data User Services (NASDA Mr. Fukui)

11. GCOM/SGLI (Dr. Sobue, NASDA/SPPD)
Handout: Global Change Observation Mission (GCOM) SGLI (Second-generation GLI) (Dr. Sobue, NASDA)

Standard Algorithm Session
12. L1 simulator (Mr. Ikejo, NASDA/EORC-WTC)
Handout: GLI Level 1 Simulator Development Status (NADA Mr. Ikejo)

13. GLI Standard Higher Algorithm Implementation Status (Mr. Inoue, Fujitsu Ltd.)
Handout: GLI Standard Higher Algorithm Implementation Status (Fujitsu Mr. Inoue)

14. GLI higher standard Algorithm Development Activities (Mr. Kurihara, NASDA/EORC/GLI Manager)
Handout: ADEOS-II Higher Standard Algorithms Development Activities (NASDA Mr. Kurihara)

15. GLI research rain algorithm (Dr. Lensky, The Hebrew University)
Handout: Using the BTD Method for the night, GLI Precipitation Algorithm (Dr. Lensky, Dr. Rosenfeld, The Hebrew University)

16. Retrieval of cloud geometric correction algorithm for turbid case 2 Asian waters (Dr. Kuji, Nara Women's University)
Handout: Retrieval of cloud geometrical parameters and water vapor for GLI (Dr. Kuji, Nara Women's University, Dr. Uchiyama, Meteorological Research Institute, Prof. Nakajima, University of Tokyo)

Ocean Group
17. ADEOS-II SST and GODAE (Dr. Kawamura, Tohoku University)
Handout: ADEOS-II SST and GODAE (Dr. Kawamura, Tohoku Univ.)

18. Iterative atmospheric correction algorithm for turbid case 2 Asian waters (Dr. Toratani, Tokai University)
Handout: Interactive atmospheric correction algorithm for turbid case 2 Asian waters (Drs. Toratani, Tanaka, and Fukushima, Tokai University)

Land Group
19. Atmospheric Correction (LTSK-1) for ADEOS-II GLI Land Product: Algorithm and Current Status (Dr. Yoshioka, Aichi Prefectural University)
Handout: Atmospheric Correction (LTSK-1) for ADEOS-II GLI Land Product: Algorithm and Current Status (Dr. Yoshioka, Aichi Prefectural University, Drs. Huete and Didan, University of Arizona, Dr. Mitomi, RESTEC)

20. A study on BSI (BRF Structure Index) using BRF property (Dr. Honda, Chiba University)
Handout: A study on BSI (BRF Structure Index) using BRF property (Drs. Honda, Konda, Hongo, Ichikawa and Kajiwara, Chiba University)

Cryosphere Group

21. Snow BRDF model using non-spherical snow particles and its validation with field measurements (Dr. Aoki, Meteorological Research Institute)

Handout: Snow BRDF model using non-spherical snow particles and its validation with field measurements (Dr. Aoki)

22. NASDA/GLI Calibration Team Report: The Extra-terrestrial Solar Irradiance (Dr. Nieke, NASDA)

Handouts:

(1) Selection of a Solar Spectrum for GLI (Drs. Nieke, NASDA, and Dr. Fukushima, Tokai University)

(2) Solar Spectrum Uncertainties (350-2500 nm) (Dr. Nieke, NASDA)

Day 2 (November 15, 2001)

Calibration/ Validation Session

23. GLI Calibration Plan-Calibration Working Group Leader (Dr. Senga)

Handout: Not available at the time these minutes were created.

24. GLI Mission Data Evaluation Test Results (Mr. Tanaka, NASDA ADEOS-II Project (Sensor Development))

Handout: GLI Mission Data Evaluation test Results (Mr. Tanaka, NASDA)

25. GLI Calibration Plan- NASDA/EORC (Dr. Asanuma, NASDA EORC)

Handout: Method for correcting strip noise in GLI images (Drs. Yoshida and Y. Mitomi, RESTEC, Mr. H. Murakami, NASDA)

26. GLI Validation System-Validation Working Group Leader (Dr. Takamura)

Handout: Not available at the time these minutes were created.

27. GLI Validation System- RESTEC (Dr. Mukaida, RESTEC)

Handout: ADEOS-II/GLI Validation System (Dr. Mukaida, RESTEC)

28. GLI Validation System- NASDA/EORC (Dr. Asanuma)

Handout: In-situ data policy (Dr. Asanuma)

29. Atmosphere validation Plan report – Methods, instrumentation (Dr. Takamura)

Handout: Validation in the atmosphere group (Dr. Takamura)

30. Atmosphere validation Plan report – A new algorithm for correcting cloud brokenness effects (Dr. Kikuchi)

Handout: Data Processing System for Validation of Atmosphere Products (Dr. Kikuchi, NASDA)

31. Ocean validation Plan report – Methods, implementation (Dr. Ishizaka)

Handout: Verification of GLI In-Water Algorithms with Data around Japan (Drs. J. Ishizaka and K. Tashima, Nagasaki University, Dr. S. Saitoh, Hokkaido University)

32. Land validation Plan report – Methods, implementation (Dr. Honda)

Handout: Not available at the time these minutes were created.

33. Cryosphere validation Plan report – Methods, implementation (Dr. Aoki)
Handout: Not available at the time these minutes were created.

Algorithm/ Validation Parallel Sessions
Atmosphere Group
A-1. Combined Data Analysis (Dr. Mukai)
Handout: Not available at the time these minutes were created.

A-2. Measurement of Optical and Chemical Properties of Atmospheric Aerosols at Amami-Ushima and Fukue Islands (Dr. Ohta, Hokkaido University)
Handout: Measurement of Optical and Chemical Properties of Atmospheric Aerosols at Amami-Ushima and Fukue Islands (Drs. Ohta and Kato, Hokkaido University)

A-3. Surface Radiation Budget (SRB) Algorithms (Dr. I. Okada for Pinker)
Handout: Not available at the time these minutes were created.

A-4. New Algorithm for Correcting Cloud Brokenness Effects (N. Kikuchi)
Handout: Not available at the time these minutes were created.

A-5. Neural Network Approach to the Retrieval of Cloud Parameters of Inhomogeneous Clouds (Dr. Isaka, Universite Blaise Pascal)
Handout: Neural Network Approach to the Retrieval of Cloud Parameters of Inhomogeneous Clouds (Dr. Isaka, Universite Blaise Pascal)

A-6. Atmospheric Algorithm Performance/Evaluation Report (Dr. Ackerman, University of Wisconsin)
Handout: Not available at the time these minutes were created.

A-7. Development of Algorithms for Retrieving Cloud (Prof. Teruyuki Nakajima)
Handout: Not available at the time these minutes were created..

Ocean Group
O-1. Calibration and Validation of the SST Derived from GLI (Dr. Barton, CSIRO Marine Research)
Handout: Calibration and Validation of the SST Derived from GLI (Dr. Barton, CSIRO Marine Research)

O-2. The present status of GLI SST validation and algorithm tuning (Dr. Kawamura)
Handout: The present status of GLI SST validation and algorithm tuning (Dr. Kawamura)

O-3. Anticipated Impact of GLI PFT results (Dr. Fukushima)
Handout: Not available at the time these minutes were created.

O-4. Atmospheric correction algorithm for GLI ocean color bands: Current status and plans (Dr. Fukushima)
Handout: Atmospheric correction algorithm for GLI ocean color bands: Current status and plans (Dr. Fukushima)

O-5. Global (GLI) Standard (Dr. Mitchell, University of California, San Diego)
Handout: Not available at the time these minutes were created.

O-6. Development of alternative-band algorithms for ADEOS-2 GLI ocean color products (Dr. Murakumi)
Handout: Not available at the time these minutes were created.

O-7. In-water Algorithm Using Neural Network (Dr. Tanaka)
Handout: Not available at the time these minutes were created.

O-8. Retrieval of pigment concentration without explicit atmospheric correction (Dr. Frouin, University of California, San Diego)
Handout: Retrieval of pigment concentration without explicit atmospheric correction (Dr. Frouin, University of California, San Diego)

Land group
L-1 Opening remark (Dr. Takeishi)
Handout: None

L-2: Dr. Toshiaki Hashimoto
Handout: Current status of LTSKG

L-3: Dr. Craig Trotter
Handout: Development of Topographic Correction Algorithms for ADEOS-II GLI Data (Dr. C. Trotter, Landcare Research, Dr. B. Combal, Unite de Bioclimatologie)

L-4: Dr. Nguyen Dinh Duong
Handout: Algorithm development for automated classification of land cover using multitemporal GLI data (Dr. Nguyen Dinh Duong, NCST of Vietnam)

L-5: Development of New Vegetation Indices and Algorithms for Detecting Vegetation Changes, - Evaluation of Global Net Primary Production of Vegetation – (Dr. Ochiai, Tezukayama University)
Handout: Development of New Vegetation Indices and Algorithms for Detecting Vegetation Changes, - Evaluation of Global Net Primary Production of Vegetation – (Dr. Ochiai, Tezukayama University, Dr. Daigo, Doshisha University, Dr. Zhang, Wuhan University)

L-6: Productivity estimation in forested area (Dr. Kajiwara)
Handout: Productivity estimation in forest area (Dr. Awaya)

L-7: Dr. Ryutaro Tateisihi
Handout: Global land Cover Mapping (Dr. Tateishi)

Day 3 (November 16, 2001)

Algorithm/ Validation Parallel Sessions (continued from Day 2)
Atmosphere Group (continued from Day 2)
Ocean Group (continued from Day 2)

O-9. The Asian I-Lac project using GLI Ocean Color and SST (Dr. Kawamura)
Handout: Not available at the time these minutes were created.

Discussion Topics (Dr. Mitchell)
Handout: Not available at the time these minutes were created.

O-10. Achievements and Activities FY01 of SIMBIOS Project (Dr. Barnes)
Handout: Achievements and Activities FY01 of SIMBIOS (Drs. McClaim and Fargion, NASA GSFC)

O-11. The Australian Region GLI Validation Program (Ian Barton for Mervyns Lynch)
Handout: The Australian Region GLI Validation Program (Associate Prof. Lynch, Curtin University of Technology)

O-12. The spectrometer comparison experiment (Preliminary results from KY01-09) (Dr. Nieke)
Handout: The spectrometer comparison experiment (Preliminary results from KY01-09) (Drs J. Nieke and Asanuma, NASDA, and Dr. Takahashi, RESTEC)

Land Group (continued from Day 2)

L-8. Summary discussion
Handout: Table 1 Global standard system on land cover classification system proposed in this study (continuing)

34. Dr. Stamnes
Handout: Not available at the time these minutes were created.

Summary Session

35. Cryosphere Group Report (Dr. Aoki)
Handout: Not available at the time these minutes were created.

36. Land Group Report (Dr. Tateishi)
Handout: Not available at the time these minutes were created.

37. Ocean Group Report (Dr. Ishizaka)
Handout: Not available at the time these minutes were created.

38. Atmosphere Group Report (Dr. Teruyuki Nakajima)
Handout: Not available at the time these minutes were created.

39. Algorithm Implementation discussions (Dr. Fukushima)
Handout: Not available at the time these minutes were created.

40. Calibration discussions (Dr. Senga)
Handout: Not available at the time these minutes were created..

41. Validation discussions (Dr. Takamura)
Handout: Not available at the time these minutes were created..

42. Status of Action Items from Previous Workshop (Mr. Kurihara, NASDA)
Handout: Action Items at GLI Workshop 2000 (Mr. Kurihara, NASDA)

43. Summary of the Workshop (Prof. Teruyuki Nakajima)
Handout: Summary of GLI WS2001 (1) (Dr. Teruyuki Nakajima, University of Tokyo)

Summary of Major Discussions

Day 1 (November 14, 2000)

Overviews

1. Opening address (Prof. Teruyuki Nakajima, University of Tokyo)

Handout: None

- Prof. Nakajima welcomed delegates to the workshop and opened the workshop.

2. Words from NASDA

2.1 ADEOS-II Program Scientist Dr. Sumi

Handout: None

- Dr. Sumi greeted all participants.
- ADEOS-II GLI hardware development has been successfully completed.

2.2 NASDA/EORC Director Mr. Otsuki

Handout: None

- Mr. Otsuki greeted the participants on behalf of Dr. Ogawa, who is the director of EORC and not available for the workshop due to travel.
- Mr. Otsuki appreciated the participants attended the workshop given the unstable travel situation.
- NASDA successfully completed the ADEOS-II development review and confirmed that the ADEOS-II project is ready to proceed to the next step, which is the pre-launch operation.
- Higher level product development completed and integrated into ground processing and ready for launch
- The Space Activity Committee will review a change request on ADEOS-II launch date and make a public announcement today.

2.3 ADEOS-II Science Project Manager Mr. Matsuura

Handout: None

- Mr. Matsuura greeted the participants.
- Mr. Matsuura has replaced Mr. Ito as ADEOS-II Science Project Manager.

3. Science Activities Report (GLI PI Team Leader Dr. Teruyuki Nakajima, University of Tokyo)

Handout: GLI Science Activities Dec 2000-Nov 2001 (Prof. Teruyuki Nakajima, The Univ. of Tokyo)

- As the ADEOS-II launch date is to be further delayed, more time will become available for science activities before launch.

- GLI sensor development goes well except for the over-saturation problem.
- NASDA hasn't informed the science community of the budget status for the next Japanese fiscal year.
- 250-m data coverage is still a concern and should be discussed in this workshop.
- Both NASA and Japanese scientists are generating OCTS GAC dataset. NASDA should support the Japanese scientists.
- To better utilize the reduced budget, we should increase the efficiency of science team activities; e.g., eliminate duplicate research activities.
- GLI product generation: NASDA should provide a digital counts to observed radiances conversion tool.
- GLI L2 system distribution: MODIS data is required for scientists to process GLI data. NASDA has developed a MODIS to GLI re-formatter, which will enable users to analyze both GLI and MODIS.
- Science data concern: Is the match-up system ready and available?

Question (Teruyuki Nakajima) What is the status of Ocean Color Channel algorithm? Has it been rewritten or shipped?
Answer (Murakami) It is being written and has not been shipped to EOC.

4. ADEOS-II Status Report (Mr. Ishida, NASDA/SPPD Deputy Director)
Handout: ADEOS-II Program Status (Mr. Ishida, NASDA)

- The primary reason for the delay of ADEOS-II launch is that the second test flight of H-IIA has been postponed to January 31st, 2001. The necessity of fixing the launch vehicle hardware is the secondary reason.
- Office of Satellite Technology Research and Application (OSTRA) was created as the result of a re-organization at NASDA in April. OSTRA is responsible for all satellite projects including earth observation satellites.
- Mr. Ishida reported the status of flight segment, ground segment and research activities. There is no show-stopper.
- ADEOS-II operation project team will be formed in JFY2002.
- Tentative ADEOS-II data policy has been presented. Basically, ADEOS-II data will be provided at reproduction costs. Data will be provided to PIs and cooperative researchers free of charge. Commercial data distribution policy will be determined later.
- In response to an action item set at the last workshop, Mr. Ishida stated that the same data policy would apply to registered users. He also mentioned that standing order service would be available to registered users, as well.
- There are three open issues; i.e., (1) generation of DCS utilization plan, (2) GLI 250m observation plan (Antarctica and South America) and (3) data processing capability:

Question (Teruyuki Nakajima) What action has been taken to obtain data for South America?
Answer (Ishida) NASDA is conducting a study as to how GLI 250m data can be obtained.

5. GLI Project Status Report (Mr. Matsuura, ADEOS-II Science Mission Manager)

Handout: ADEOS-II Science Project Status (Mr. Matsuura, NASDA)

- Mr. Matsuura summarized the status of all observation satellites that are either operational or under development.
- ADEOS-II Science Project organization and responsibilities were presented.
- Cal/Val results and plans were presented.
- PIs requested GLI 250m data. Data availability will heavily depend on data relay satellite availability.

Question (Teruyuki Nakajima) To all participants, Prof. Nakajima asked if they had any questions on the structure of GLI science project.
Answer: Nobody voiced a question or concern about the GLI science project structure.

6. GLI Sensor Development Report (Mr. Tanaka, NASDA ADEOS-II Project (Sensor Development))

Handouts:
(1) GLI Sensor Development Status (Mr. Tanaka, NASDA)
(2) GLI Mission Data Evaluation Test Results (Mr. Tanaka, NASDA)

- GLI development has been successfully completed and is ready for launch.
- GLI has been shipped to the Tanegashima Space Center.
- Prof. Nakajima requested that NASDA conduct further, detailed characterization of GLI sensor. NASDA conducted the GLI Mission Data Evaluation Test using an integrating sphere and a fixed-point black body. GLI VN/SW/MT performance data were collected.
- GLI initial in-orbit checkout sequence was presented.

Question: (Mitchell) Are the calibration tables, which were created from the GLI Mission Data Evaluation Test, available?
Answer (Tanaka): The test was just completed and the test report is written in Japanese. The summary page will be provided during this meeting. (Note: The summary page was provided.)
Answer (Matsuura): NASDA EORC will make the GLI performance data available to GLI-PIs.
Action Item 1: NASDA EORC will make the GLI performance data available to GLI-PIs.
Question (Barton) Is NASDA concerned that system characterization may change while in storage for extra 9 months? Will NASDA use the extra time to carry out further tests to confirm system characterization at launch?
Answer(Tanaka): No, NASDA is not concerned and doesn't have a plan for additional tests. The test will require 3 months and test data analysis will require 7 months. The on-board lamp data and on-board black body data analyses have not been completed. We will complete the analyses before the ADEOS-II launch.

7. A Ground Processing System Report (Mr. Ikejo, NASDA/EORC-WTC)

Handout: Not available at the time these minutes were created..

- Mr. Ikejo reported the status of the ground processing system development, the system configuration and major specifications

Question (Fukushima): When will the different versions of Level 1 software be released?
Answer (Ikejo): 4 months after launch for version 0.5 and 9 months after launch for version 1.0.

8. GLI 250 Data Acquisition (Mr. Matsuura, ADEOS-II Science Mission Manager)
Handout: GLI-250m Data Acquisition Analysis (Mr. Matsuura, NASDA)

- GLI-250m operation priority, GLI-250m observation requirements were presented.
- Results of GLI-250m data request are posted on URL http://sharaku.eorc.nasda.go.jp/pisdoor/gli/survey2/index.html.

Question (Mitchell): I want further information on GLI-250m direct downlink. Will GLI-250m data be transmitted via X-band? Will GLI-250m data be broadcast all the time or just at selected times?
Answer (Matsuura): Yes, the data will be transmitted via X-band. NASDA has not decided reception policy.
Answer (Shimoda): Due to thermal constraints, continuous downlink will not be possible. With a high data transmission rate of 60Mbps, the antenna diameter needs to be at least 10 m.

9. To acquire more GLI-250m global (Ms. Miura, NASDA/EORC/EOC-Hatoyama)
Handout: To acquire more GLI-250m global data <Technical Study> (Ms. Miura, NASDA)

- Ms. Miura presented the results of GLI-250m global coverage study.
- The study result shows that three regions are not currently covered for direct downlink of GLI-250m data.

Question (Teruyuki Nakajima) You have not included analysis of how data from Region 1 (central Asia) might be obtained. What information do you need to do this?
Answer (Miura): I used only information available at EOC

Question (Teruyuki Nakajima) Have you decided South American sites?
Answer (Ishida) Not yet.

Comment (Ishida) There is a ground station in Siberia and they are interested in receiving NASDA satellite data.
Comment(Shimoda) For Region 2 we could also use a ground station in Los Palmas (Spain-Canary Islands). Also there is a ground station in Germany
Comment (Tateishi) I want to stress the importance of obtaining 250 m data from central Asia. For Japan and for land studies this is a critical region

Question (Shimoda) Did you show a gap in coverage of Western U.S.A.?
Answer (Miura) Yes.

Question (Teruyuki Nakajima) What is NASDA's position as to the GLI-250m data acquisition? What resources will NASDA make available for GLI-250m. What is the mechanism to obtain access to ground station? I don't think NASDA has enough resources. Is NASDA able to pay for doing so?

Answer (Ishida) There is a bilateral arrangement that depends on interest of the host nation. We can make data available in exchange for access. No other resources are likely to be available
Answer(Matsuura) After EOC makes an analysis, this is submitted to NASDA and NASDA negotiates with each agency involved.
Comment(Ishida) Note that the study assumed that the ODR is off during data acquisition. We want to study the pattern of coverage in the case that the ODR is on.

Comment (Teruyuki Nakajima) Why don't we have information on Region 1? You should conduct additional surveys to have optimum 250m data coverage with a limited number of direct receiving sites.
Answer (Miura) There was no information in NASDA because there was no receiving station in region 1, which was recognized by NASDA.--> Then several participants pointed out that some facilities exist even in Region 1.

10. EOC Data User Service (Mr. Fukui, NASDA/EORC/EOC-Hatoyama)
Handout: EOC Data User Services (Mr. Fukui, NASDA)

- Mr. Fukui presented the user services available from EOC, interactive interfaces via EUS, catalog information and interoperability with NASA, browse search, media and formats, graphical image service and service availability, among others.
- NASDA developed the CIS (Catalog Interoperability Subsystem) to link to NASA catalog subsystem.
- Off-line data can be ordered in two ways; standard product orders (scene orders) and standing orders.

Question (Barton) When will data become available from EOC to PIs for CAL/VAL activities?
Answer (Fukui) There will be no data distribution for the first 4 months. EORC will send data between 4 and 12 months. Thereafter EOC will take over EORC and start sending data.

Question (Teruyuki Nakajima) Are there any plans to give PIs access to EORC data sooner for algorithm development needs (rather than through EOC)? What mechanism will NASDA use to distribute the data if PI request data within a year from launch? How much data will become available from EORC to the research community?
Answer (Fukushima) As an algorithm scientist, I will try to coordinate with EORC/EOC and make a report on this issue later in this meeting
Answer (Matsuura) EORC will accept data requests from PIs and forward the requests to EOC and distribute level 1 and higher data to PIs, as the requested data become available.

Question (Fukushima) Is this only Level 1?
Answer (Fukui) Yes.

Question (Mitchell) Does NASDA have any plan to use re-mapped MODIS data to test data delivery service prior to launch?
Answer (Fukui) No, there is no such plan.

Question (Ishida) Is the catalog subsystem interoperable with agencies other than NASA?
Answer (Fukui): No, it isn't.

Question (Shimoda) Does NASDA plan to provide Level 2A browse capability from EOC? If not, why? Level 2A is a standard product.
Answer (Fukui) The primary purpose of browse images is to identify the scenes that are to be ordered via the EUS. For this reason, EOC requested GLI PIs and GAIT members to identify demands of browse data. GLI PIs and GAIT members came back with no requirements for L2A browse. On the other hand, most users will ask for all L2A data, not selected L2A scenes. These are the reasons why NASDA decided not to provide L2A browse.

Question (Barnes) The SIMBIOS Project is very interested in working with GLI data. While we wait for launch, may we (the SIMBIOS Project) please have the GLI data format and a practice dataset? This would be of great assistance. Can NASDA provide a detailed GLI data format document and practice data sets (simulated data) before launch?
Answer (Kurihara) This was an action item at the last workshop and NASDA has placed GLI data format document on the PI's DOOR website, which is a part of the GLI homepage. This is only the data format, no data has not been posted yet.
Answer (Takashi Nakajima) Datasets are divided into the following two categories.

A) Synthesized dataset calculated by radiation transfer with GLI response function.---> 1 scene of L1b, but sorry, the format is a simple flat binary (CD-ROM is available).
B) MODIS-origin dataset transformed to GLI's HDF format--->An exact GLI format. Distribution depends on its size. --->Thus, it will be convenient to install the format conversion system on your computer.

I have already distributed CD-ROMs that contain simulated data and re-sampled MODIS data (only single scene) more is not available because of dataset size.

a)CD-ROM for "Ocean" has a problem with up-welling radiance.
b)We will re-press this on CD-ROM, but it will depend on budget. Please contact Dr. Takashi Nakajima (nakajima@eorc.nasda.go.jp) or Dr. Hiroshi Murakami (murakami@eorc.nasda.go.jp) (8mm or other media will be available).

Question (Teruyuki Nakajima)
(1) When will EUS software be updated? Will you update EUS software after launch to reflect user's opinions and/or requests?
(2) Web-based system should not be limited to Windows system only. Can Mac be used?
Answer (Fukui)
(1) To my regret, I am uncertain about version up of EUS. But we understand the importance of update, and will make efforts to reflect user's requirements.
(2) Yes. Web browser of Mac and UNIX are also available.

11. GCOM/SGLI (Dr. Sobue, NASDA/SPPD)

Handout: Global Change Observation Mission (GCOM) SGLI (Second-generation GLI) (Dr. Sobue, NASDA)

- GCOM is a part of a 15-year global change observation effort, which was initiated by ADEOS-II mission.
- GCOM mission will include GCOM-A1, B1, A2 and B2. Launch of GCOM-A1 and B1 is slated for 2007.
- The overpass time of GCOM-B1 is currently set for 10AM. The Ocean Science community voiced a concern about the overpass time that sunshine will not be enough.
- GCOM-A1 and B1 will use only X-band direct downlink and will not depend on a data-relay satellite. Foreign polar region ground stations will be used.
- SGLI is in a conceptual study phase.
- Tentative SGLI performance specifications have been developed.
- To formulate GCOM-B1, NASDA would like to consult with ADEOS-II scientists about the scientific benefits of three instruments (SGLI, AMSR follow-on, d-scat, as a single satellite).
- In addition, SGLI user WG has requested to hold a small SGLI splinter meeting to collect some opinions on the tentative SGLI specifications.

Standard Algorithm Session

12. L1 simulator (Mr. Ikejo, NASDA/EORC-WTC)

Handout: GLI Level 1 Simulator Development Status (Mr. Ikejo, NADA)

- Mr. Ikejo presented the status of Level 1 simulator development.

Question (Takashi Nakajima) What is the difference between version 1.0 and 1.1?
Answer (Ikejo) There is no significant difference. The algorithm is slightly changed.

Question (Teruyuki Nakajima) What is the schedule for testing program?
Answer (Ikejo) We started testing and have not yet finished yet. We have a plan to test the program through sets of increasing size.

13. GLI Standard Higher Algorithm Implementation Status (Mr. Inoue, Fujitsu Ltd.)

Handout: GLI Standard Higher Algorithm Implementation Status (Mr. Inoue, Fujitsu)

- Mr. Inoue presented the history of higher algorithms, schedule of future releases, features of the algorithms, MODIS reformat tool status,

Question (Teruyuki Nakajima) There are two simulation data sets. Why are you using MODIS data for testing and not Level 1 GLI simulated data? L1 simulation data testing schedule should be documented.
Answer (Inoue) Because appropriate synthesized data is not available. The test is to check the system, not the algorithm. We will document the test schedule.

Question (Teruyuki Nakajima) What is the difference between NRT dataset and match-up data set?
Answer (Inoue) NRT dataset is archived at EOC for supporting operations and match-up

dataset is archived at EORC for calibration/ validation.

Question (Trotter) Do you have a schedule for implementing research algorithms?
Answer (Takashi Nakajima) We will present a report on research algorithms. If one proves to be better than any existing algorithms, we will implement it.

Questions (Shimoda) What is the result of system performance tests? When can we expect the results?
Answer (Inoue) We haven't evaluated the performance.
Question (Shimoda) When can we get it?
Answer (Inoue) Before the end of this year.

14. GLI higher standard Algorithm Development Activities (Mr. Kurihara, NASDA/EORC/GLI Manager)

Handout: ADEOS-II Higher Standard Algorithms Development Activities (NASDA Mr. Kurihara)

- Mr. Kurihara presented the processing flow of higher standard products,
- Examples of standard higher products were presented.

Highlights in the promising algorithms
Atmosphere Group
15. GLI research rain algorithm (Dr. Lensky for Dr. Rosenfeld, The Hebrew University)

Handout: Using the BTD Method for the night, GLI Precipitation Algorithm (Drs. Lensky and Rosenfeld, The Hebrew University)

Question (Teruyuki Nakajima) Why didn't you use 11-12 micrometers split window channels rather than 3.7-11 micrometers difference for which particle size sensitivity is not large?
Answer (Lensky) Because the sensitivity of 3.7 –11 micrometers to particle size is better than 11-12 micrometers.

16. Retrieval of cloud geometric correction algorithm for turbid case 2 Asian waters (Dr. Kuji, Nara Women's University)

Handout: Retrieval of cloud geometrical parameters and water vapor for GLI (Dr. Kuji, Nara Women's University, Dr. Uchiyama, Meteorological Research Institute, Prof. Nakajima, University of Tokyo)

- Dr. Kuji presented the evaluation results of cloud geometric correction algorithm.
- Dr. Kuji will further refine the algorithm and work on the multilayer issue.

Comment (Takashi Nakajima) In the comparison between MCR and in situ data, I reported in 1991 over estimation of effective particles radius than in-situ data
Answer (Kuji) The new algorithm uses LOWTRAN 7 while the old one uses LOWTRAN 5

Question (Isaka)
(1) Your estimation of cloud top height seems rather good, even if there is some bias

compared with LIDAR observation. Isn't it because LIDAR is insensitive to cloud bottom height under large optical thickness?

(2) What kind of LIDAR temperature profile did you use to simulate your radiance data?

Answer (Kuji)

(1) Maybe so.

(2) I used a constant lapse rate profile. I hope to use a more realistic profile in future.

Ocean Group

17. ADEOS-II SST and GODAE (Dr. Kawamura, Tohoku University)

Handout: ADEOS-II SST and GODAE (Dr. Kawamura, Tohoku University)

- GODAE (Global Ocean Data Assimilation Experiment) heavily depends on SST.
- GLI SST and AMSR SST have been compared.
- Diurnal amplitude variation was analyzed.
- SST merging strategy has been developed.
- SST availability has been investigated.
- Validation of the new generation SST has been analyzed.

Question (Teruyuki Nakajima) Why do you have increased errors between mean Sea surface temperature and minimum SST? Why bother with minimum SST?

Answer (Kawamura) Because we used acquisition times of different lengths. Daily mean is average [and so better averaged] while daily minimum is one particular time [the minimum temperature is estimated at 5 am and compared to the temperature reported by the buoys at 6 am]

Comment (Barton) Daily mean and daily minimum are almost the same. It is only for low wind speed that there is a substantial difference between daily mean and minimum

Question (Isaka) Are you using exactly the same data set when you talk about an increase in RMS?

Answer (Kawamura) Yes. The same dataset was used except the minimum temperature is at 5 am and the observed temperature at 6 am.

18. Iterative atmospheric correction algorithm for turbid case 2 Asian waters (Dr. Toratani, Tokai University)

Handout: Interactive atmospheric correction algorithm for turbid case 2 Asian waters (Drs. Toratani, Tanaka, and Fukushima, Tokai University)

- Dr. Toratani presented a new atmospheric correction algorithm, in which water-leaving reflectance at near infrared band is treated as a function of chlorophyll-a (chl), inorganic suspended matter (SS) and yellow substance (CDOM).
- The new algorithm doesn't work if water-leaving reflectance value is negative.
- With three to four iterations, a good estimate can be obtained.

Question (Teruyuki Nakajima) Could you add soil dust parameter? In case 2 there is lots of soil dust contamination

Answer (Toratani) It is difficult. We already estimated atmospheric absorption and use a correction of 25%

Question (Isaka)
(1) Is there any justification to use such a complicated neural network with three hidden layers? In most cases, we can use nets with two hidden layer.
(2) You retrieve 3 target parameters at the same time. In doing so, you are taking risk to impose some implicit constraints. It would be better to retrieve each one of three parameters with an independent neural net.

Answer (Toratani)
(1) We tested 2, 3 and 4 layers. The 3-layer net provided the best result.
(2) No comment from the speaker.

Question (Barton) In southern hemisphere we get negative water-leaving radiances when the skies are very clear with low aerosol content. You seem to have negative water-leaving radiances with significant aerosol. Do you have any comment?

Answer (Fukushima) We have a match-up dataset of ship-measurement and SeaWiFS observation in the Japan Sea under clear sky, where we still get negative water leaving radiance under the standard atmospheric correction. This may result from anthropomorphic absorptive aerosols. Maybe we need to modify the "standard atmosphere" model, like adding soot aerosol model.

Answer (Mitchell) Negative water-leaving radiance is physically impossible. SeaWIFS gives very low 443 and 412 nm water-leaving radiances in many cases. So, it is not only the problem of negative L_{wn}, but also low estimates routinely retrieved at 412 and 443 even for case 1 water. Maybe there are more colored aerosols than we thought – even in the southern hemisphere. We need to do further work on atmospheric correction, especially at 412 and 440 nm where radiances are too low.

Question (Shimoda) How many nodes have you used for hidden layers?

Answer (Tanaka) 50, 12, 9 and 6, but used many different cases and presented only these results

Land Group

19. Atmospheric Correction (LTSK-1) for ADEOS-II GLI Land Product: Algorithm and Current Status (Dr. Yoshioka, Aichi Prefectural University)

Handout: Atmospheric Correction (LTSK-1) for ADEOS-II GLI Land Product: Algorithm and Current Status (Dr. Yoshioka, Aichi Prefectural University, Drs. Huete and Didan, University of Arizona, Dr. Mitomi, RESTEC)

- Dr. Yoshioka presented LTSK-1 algorithm update, Look-up-table modifications, algorithm testing using satellite data, and on-going and future activities
- Dr. Yoshioka developed Look Up Tables (LUT), which depend on Tau_R and illumination angles.
- Dr. Yoshioka validated the algorithm by applying it to EO-1 Hyperion data processing.
- Dr. Yoshioka will further test the algorithm using MODIS L1B data as well as data from other sensors.

Question (Teruyuki Nakajima) Is it possible to include aerosol correction parameters in the algorithm?

Answer(Yoshioka) Yes, it is something we need to do and we are working on it. But it is not so simple.

Question (Fujiwara)
Answer (Yoshioka)

20. A study on BSI (BRF Structure Index) using BRF property (Dr. Honda, Chiba University)

Handout: A study on BSI (BRF Structure Index) using BRF property (Drs. Honda, Konda, Hongo, Ichikawa and Kajiwara, Chiba University)

- Dr. Honda measured BDF using a radio-controlled helicopter.
- BSI can differentiate different vegetation structures.

Cryosphere Group

21. Snow BRDF model using non-spherical snow particles and its validation with field measurements (Dr. Aoki, Meteorological Research Institute)

Handout: Snow BRDF model using non-spherical snow particles and its validation with field measurements (Dr. Aoki)

- Dr. Aoki studies aim to improve the GLI cryosphere algorithms for parameters such as snow grain size and impurities.
- To evaluate the algorithm, Dr. Aoki conducted a field campaign in February 2001 in Hokkaido.
- Hexagonal column was proved to be a better model for dendrites snow BRDF than oblate, prolate, HC, HP and sphere.
- Effects of crystal surface roughness on phase function are similar to the complicated crystal shape.

22. NASDA/GLI Calibration Team Report: The Extra-terrestrial Solar Irradiance (Dr. Nieke, NASDA)

Handout:
(1) Selection of a Solar Spectrum for GLI (Drs. Nieke, NASDA, and Dr. Fukushima, Tokai University)
(2) Solar Spectrum Uncertainties (350-2500 nm) (Dr. Nieke, NASDA)

- Dr. Nieke presented the study results of solar spectra models, which are to be used for optical sensor calibration.
- There are significant differences between the different solar spectra data. This is why it is important to select the spectrum with the lowest errors.
- Dr. Nieke compared the spectra using the GLI spectral sensitivity and assessed the in-land irradiance value.
- GLI leader meeting from October 17th selected the latest Thuillier data (2001) as solar reference.

Comment (Teruyuki Nakajima) Decision has been made to use the Thuillier 2001 spectral data. PI's are encouraged to use this dataset. PIs will need a look up table of in-band

irradiance values

Question (Ackerman) Is the GLI spectral function data available?
Answer (Nieke) Yes, it is.

Comment (Barnes) I'm a member of NASA's EOS calibration team. EOS had decided to let their PIs use their own values so long as they make it clear which values they are using, however I sent your paper to my boss, Charles McClain, and he stands the same discussion again.

Question (Isaka) What will you use for the 3.7μm wavelength.
Answer (Nieke) This work covers only the reflective channels of GLI.

Comment (Fukushima) As long as the calibration team at NASDA is responsible for obtaining calibration numbers for all the GLI bands, you need to fix some appropriate numbers.
Question (Isaka) Your values only go up to channel 29. What about higher channels, particularly channel 30 where it is necessary to subtract emission value to get an absolute value? So it is more important than for other channels.
Answer (Nieke) The background of the study was to find/select a solar spectrum for the sun calibration of GLI. Since this sun calibration is reflection-based, it was not necessary to include channels with wavelength larger than 2.5μm. However, we are able to provide more in-band irradiance values than up to 2.5μm.
Comment (Teruyuki Nakajima) So we need more surveys.

Action item 2: NASDA/GLI calibration team should provide in-band irradiance data for the effective GLI channels and a survey of irradiance models for channel 30.

Day 2:
Calibration/ Validation Session
23. GLI Calibration Plan- Calibration Working Group Leader (Dr. Senga, TOKAI University)
Handout: Not available at the time these minutes were created..

- Dr. Senga presented the status of the GLI Calibration Working group activities.

24. GLI Mission Data Evaluation Test Results (Mr. Tanaka, NASDA ADEOS-II Project (Sensor Development))
Handout: GLI Mission Data Evaluation test Results (Mr. Tanaka, NASDA)

- Mr. Tanaka presented the results of GLI mission data evaluation test.
- As the result of VN/SW linearity coefficient calculations, two issues were identified; one is VN2 over-saturation, and the other is instability of CH-27 (1.38 micron) output.
- MT linearity coefficients were also calculated.

Question (Ishizaka) How should we interpret the graphs (VN/SW linearity) on page 9 of the presentation material?
Answer (Tanaka) Linearity line should be referenced to the left axis which represents

radiance [W/m2/sr/micron]. Error bar should be referenced to the right axis which represents linearity fitting residuals [%].

Question (Teruyuki Nakajima) Over-saturation problem. Are there any effects on channels other than reported channel?
Answer (Tanaka) If Lcloud is correct, the over-saturation would not affect the other bands. Lcloud represents the maximum radiance in orbit.
Answer (Fukushima) We need to check that Lcloud data is OK.
Question (Teruyuki Nakajima) Who will do this?
Answer (Tanaka) In the case that Lcloud is revised, I will check our analysis again.

Question (Teruyuki Nakajima) VN2 response needs a quadratic formula. Do you plan to include this effect in the L1 algorithm?
Answer (Tanaka) Yes.

Question (Teruyuki Nakajima) Is there such a mechanism in L1?
Answer (Tanaka) There is a look up table, which was can be changed if necessary.

Question (Teruyuki Nakajima) How do you correct water vapor effect in channel 27?
Answer (Senga) We can do it in-orbit. It will be further reviewed.

Question (Teruyuki Nakajima) I saw many groups (1-6 groups), which are staffed with the same people. NASDA should allocate more people for calibration efforts. What is NASDA's position on this issue? NASA would allocate 20 people for this size of activities. NASDA allocates only a few persons.
Answer (Asanuma) This is an EORC initiative and division of responsibilities between EORC and EOC is complicated.
Comment (Teruyuki Nakajima) We need a better mechanism

Comment (Teruyuki Nakajima) Regarding vicarious calibration concerning upward radiances by Ocean and atmosphere and downward radiances for land and atmosphere, we can't use aircraft. We need help from foreign PIs, NASA, Australia. Japanese atmosphere group can't measure cloud reflectance. MODIS team may help.

Question (Teruyuki Nakajima) For land group, is there any plan for surface leaving radiance measurement? How many sites exist?
Answer (Honda) We have 8 sites. Mongolia team has 5. We can discuss with atmosphere group about using their sites. Ask Takamura-san to send his students to collect atmosphere data. We may be able to have a **g**ood collaboration between ocean and atmosphere.

Question (Teruyuki Nakajima) What is the net result of presentation; are you saying that you have bad measurements?
Answer (Senga) We have a linear curve. The problem is with reproducibility.

Question (Teruyuki Nakajima) You've shown effects of water on channel 1.3 micrometers.
Answer (Senga) We have fixed the calibration, however, there is still a large variation.

Maybe this can be fixed on orbit. We need to discuss this.

25. GLI Calibration Plan- NASDA/EORC (Dr. Asanuma, NASDA EORC)

Handout: Method for correcting strip noise in GLI images (Drs. Yoshida and Y. Mitomi, RESTEC, Mr. H. Murakami, NASDA)

- Dr. Asanuma just returned from a field campaign in the East China Sea and reported the results of the campaign.
- Dr. Asanuma conducted vicarious calibration for high radiance regions; i.e., sand region for land region, Antarctica and Hokkaido for snow and ice region.

Question (Teruyuki Nakajima) How many land sites are planned to measure surface leaving radiances?
Answer (Asanuma) Drs. Honda and Takamura will discuss the coordination of L_{upward} and $L_{downward}$ measurements.

Comment (Teruyuki Nakajima) We have to ask help from foreign participants with over cloud measurements.

26.GLI Validation System- Validation Working Group Leader (Dr. Takamura, Chiba University)

Handout: Not available at the time these minutes were created..

- Dr. Takamura gave an overview the GLI validation system.
- There are 5 validation groups; atmosphere, ocean color, SST, land/vegetation and cryosphere.
- Validation groups supply match-up data. Algorithm researchers can validate their algorithms using the match-up data.
- Standard products shall be validated first. Then validation of research products should be considered.

Comment (Teruyuki Nakajima) Match up data will be distributed to PIs from EORC.

27. GLI Validation System- RESTEC (Mr. Mukaida, RESTEC)

Handout: ADEOS-II/GLI Validation System (Dr. Mukaida, RESTEC)

- Mr. Mukaida described the GLI validation system with the emphasis on databases.
- GTDB will contain in-situ data.
- MUDB will store every processing status and collocation conditions.
- Validation data generation system is developed.
- MUD will be distributed to PI.
- In-situ data distribution policy will be released.
- Trial data generation will start immediately after this workshop; NL in November, CS in mid December and ST in January 2002.

28. GLI Validation System- NASDA/EORC (Dr. Asanuma)

Handout: In-situ data policy (Dr. Asanuma)

- Dr. Asanuma presented the in-situ data policy that defines data sources, distribution.
- Dr. Asanuma proposed a form that should be filled out by data provider.

Comment (Teruyuki Nakajima) We need to take care of data providers, give them information about GLI mission and establish mutual benefit to provider and GLI.
Action item 3: NASDA will coordinate with PIs and data providers about the In-situ data distribution form proposed by Dr. Asanuma.
Action item 4: NASDA will investigate a protocol and format for query of data transfer from in-situ data providers

29. Atmosphere validation Plan report – Methods, instrumentation (Dr. Takamura, Chiba University)

Handout: Validation in the atmosphere group (Dr. Takamura)

- Dr. Takamura presented the members (universities, institutes and foreign institutions/ universities)
- There are 8 standard atmosphere products and 4 research atmosphere products.

30. Atmosphere validation Plan report – A new algorithm for correcting cloud brokenness effects (Dr. Kikuchi, NASDA EORC)

Handout: Data Processing System for Validation of Atmosphere Products (NASDA Dr. Kikuchi)

- SKYNET is the primary source of GT (Ground Truth) data.
- Validation data flow was presented.
- GT data and match-up data will be compared.
- The first test run of the data processing system is slated for January 2002 for SKYNET sites. Test runs for other sites will be conducted as data become available.

31. Ocean validation Plan report – Methods, implementation (Dr. Ishizaka, Nagasaki University)

Handout: Verification of GLI In-Water Algorithms with Data around Japan (Drs. J. Ishizaka and K. Tashima, Nagasaki University, Dr. S. Saitoh, Hokkaido University)

- GLI ocean validation will be performed with regard to atmospheric correction, bio-optical parameters and sea surface temperature.
- Dr. Ishizaka presented the ocean validation group members, buoy data collection system, observation items such as underwater upward radiance and downward irradiance, graphical coverage and a new buoy (CREST), among others.

Question (Mitchell) The CREST buoy is going to cast a large shadow, how do you plan on correcting for this?
Answer We have a plan on correcting for this using in water measurements

32. Land validation Plan report – Methods, implementation (Dr. Honda)

Handout: Not available at the time these minutes were created..

- Dr, Honda reported the land validation plan.

32. Cryosphere validation Plan report – Methods, implementation (Dr. Aoki)

Handout: Not available at the time these minutes were created..

- Dr. Aoki reported the Cryosphere validation plan.

Question (Teruyuki Nakajima) Are you taking account of Arctic haze contamination effect on ice?
Answer (Aoki) Yes that is important, but correction for aerosols is difficult.

Question (Teruyuki Nakajima) What is the percentage reduction in albedo due to aerosols?
Answer (Stamnes) We don't really know, and I am not aware of any reports of such measurements in which there is a one to one correlation between atmospheric measurement and snow measurement. There may be new discoveries to be made in this area.

Question (Ishida) Do you plan on using IR for validation?
Answer (Aoki) Normally no, but I know some scientists who use IR.

Question (Kuji) How do you plan to validate IR?
Answer (Aoki) We will compare with other data, microwave. Fairbanks uses aircraft.

Algorithm/ Validation Parallel Sessions
Atmosphere Group
A-1. Combined Data Analysis (Dr. Mukai)

Handout: Not available at the time these minutes were created..

- Improved aerosol retrieval for atmosphere-surface model.
- A 2-channel algorithm for aerosol retrieval is available.
- Presented data on aerosol composition for various months.

Question (Kurihara) Did you use POLDER on ozone retrieval?
Answer (Mukai) Yes

Question (Kurihara) Which algorithm was used?
Answer (Mukai) This data represents the best case, cannot tell which algorithm.
Comment (Nakajima) We cannot tell if radiance is from water leaving or aerosols. Maybe polarization can be used.

A-2. Measurement of Optical and Chemical Properties of Atmospheric Aerosols at Amami-Ushima and Fukue Islands (Dr. Ohta, Hokkaido University)

Handout: Measurement of Optical and Chemical Properties of Atmospheric Aerosols at Amami-Ushima and Fukue Islands (Drs. Ohta and Kato, Hokkaido University)

- Dr. Ohta explained various methods of aerosol collection and analysis
- Dr. Ohta presented data from tests for fine particle and metal components

Question Did you determine the soil mass?
Answer (Ohta) The soil mass was calculated by using the average value of aluminum concentration, which is 8 percent.
Question Do you have the data to use silicon concentration for this?
Answer (Ohta) The data for silicon is available but is not as sensitive as aluminum.

Question (Nakajima) Can you filter fine and course particles to check the effect of fine particles on single scattering albedo?
Answer (Ohta) Yes

Question (Hoeller) In your single-scattering albedo data, are you distinguishing between different types, like soil dust and black carbon? Are the low values coming from dust or black carbon?
Answer (Ohta) No, because we measured only fine aerosol particles.

A-3. Surface Radiation Budget (SRB) Algorithms (Dr. I. Okada for Pinker)

Handout: Not available at the time these minutes were created..

- Objective was the validation of GLI products.
- Presented results of comparison of SRB and ISCCP for November 1992.
- Comparisons with satellite-derived albedos continues.
- New collaboration established for the measurement of aerosol radiative effects over India.

Comment (Teruyuki Nakajima) The Pinker group is working with PAR data. SRB is also being calculated by my group. So the two groups can compare results.

A-4. New Algorithm for Correcting Cloud Brokenness Effects (N. Kikuchi)

Handout: Not available at the time these minutes were created..

- Presented correction methods for inhomogeneous clouds
- Compared oblique plane parallel model and Landsat TM data.

Question (Isaka) Can you explain the effective gradient more? How did you connect the fractal cloud with the slope? You are approximating a three dimensional cloud with a two dimensional model.
Answer (Kikuchi) We assumed that the direction was not important.
Comment (Nakajima) This issue should be discussed more between Kikuchi and Isaka.

A-5. Neural Network Approach to the Retrieval of Cloud Parameters of Inhomogeneous Clouds (Dr. Isaka, Universite Blaise Pascal)

Handout: Neural Network Approach to the Retrieval of Cloud Parameters of Inhomogeneous Clouds (Dr. Isaka, Universite Blaise Pascal)

- Presented necessary corrections to radiance data.

- Compared simulations of radiance using both SHDOM and rstar5b.
- Presented correction of channel 29 surface albedo effects.
- Reported on actual state of development of MNN cloud parameter retrieval.

Question (Nakajima) Why did you do a neural network for each step?
Answer (Isaka) The neural network would not converge otherwise. If you only use one wavelength then no information on optical thickness and effective radius is obtained. We use all information to correct for each wavelength. Also, we have to estimate the accuracy of corrected radiance after all corrections are done.

Question (Nakajima) Are the gradient and dispersed methods the same?
Answer (Isaka) Yes, in the sense that we are trying too evaluate influence of cloud structures on non-absorbing and absorbing wavelengths. No, in the sense that fractional cloud cores is taken into account in our approach, but not in the gradient approach.

Question (Ackerman) Is this method only for water clouds?
Answer (Isaka) For now, yes. Optical thickness of ice clouds is low. Accordingly, there will be little effect of cloud inhomogeneity. We would be able to deal with thin ice clouds through IPA approach.

A-6. Atmospheric Algorithm Performance/Evaluation Report (Dr. Ackerman, University of Wisconsin)

Handout: Not available at the time these minutes were created..

- Project currently focusing on MODIS data sets.
- Problems associated with rivers, coasts, and mis-classification of land have been corrected.
- Compared GOES cloud top height with lidar/radar values for validation.
- Used clear sky composite for quality validation.
- Current activities include the use of MODIS data to evaluate approach in preparation for GLI launch and the updating of ATSK1 ATBD.

Question (Isaka) Do you have to change the thresholds as a function of geographic region and seasons?
Answer (Ackerman) No, we define the threshold only one time then do not change it again. The threshold is relatively insensitive to season and ecosystem.

Question (Isaka) When you speak of uncertainty, to what are you referring?
Answer (Ackerman) The uncertainty concern is when one wavelength indicates cloudy while another indicates clear.
Question (Isaka) Is fractional cloud cover a concern?
Answer (Ackerman) Yes, typically if uncertainty is present the area is called cloudy.

Question Is the 1.38-micron issue that Tanaka spoke of this morning important to your work?
Answer (Ackerman) Yes, but it is not clear how extensive the problem may be.

A-7. Development of Algorithms for Retrieving Cloud (Prof. Teruyuki Nakajima)

Handout: Not available at the time these minutes were created..

- Presented a comparison of aerosol data from Cheju and Amami Islands.
- Showed application of four-channel algorithm to SeaWiFs data for the determination of aerosol type.
- Will use data from MIRAI ship cruise equipped with lidar and radar.

Ocean Group

O-1. Calibration and Validation of the SST Derived from GLI (Dr. Barton, CSIRO Marine Research)

Handout: Calibration and Validation of the SST Derived from GLI (Dr. Barton, CSIRO Marine Research)

- Reported on progress during 2001 including analysis of data from 3 validation cruises
- Compared data from Perth Ferry to MODIS and ATSR-2 satellite measurements
- Discussed radiometer calibration and inter-comparison held at U. of Miami
- Found that all radiometers can be used to validate land surface and SST to 0.1 K level
- Data from all instruments will allow use by GLI of data from all these sources

Question (Frouin) What is required accuracy?
Answer (Barton) 0.1 K.
Question (Barnes) What do you use instead of NIST Blackbody standard?
Answer (Barton) We have our own Black body, otherwise compare radiometer with standardized radiometer.
Question (Kawamura) Does ADEOS-II launch delay affect the cruises you are taking?
Answer (Barton) Cruises are used to validate other satellites
Question (Mitchell) Are any investigators doing SST validation for satellites in very cold ocean (below 5 ºC), are calibrations carried out at 20 ºC OK?
Answer (Barton) Yes, there is a group in Hobart, Tasmania and Barton group will do some Antarctic cruises. Clouds and sea ice create problems for match-ups. There are very few results for these regions.

O-2. The present status of GLI SST validation and algorithm tuning (H. Kawamura)

Handout: The present status of GLI SST validation and algorithm tuning (Dr. Kawamura)

- Discussed strategy to merge data from many sources to get SST
- Use of supercomputer allows this to be done in 2-15 minutes
- Described algorithm and data flow
- Discussed Evaluation of SST validation/algorithm Tuning using VIRS High Resolution SST data from TRMM and buoy match-up data

Questions (Barton) Have you applied this to AVHRR data? What sort of RMS?
Answer (Kawamura) 0.6-0.7 depending upon sites.
Question (Barton) Appears to be difference in Temperature when changing resolution why?
Answer (Kawamura) Changing spatial resolution from high in the infrared to low in the microwave, there are no significant degradation in the RMS errors of estimate.
Question/Comment (Barnes) Is striping you observe due to mirror edge to mirror edge

scan? Since VIRS is like a simplified GLI or MODIS.
Answer (Kawamura) We wanted to remove the striping.

General Comment (Senga)
All parameters are necessary for level 1, fortunately we still have one year. Given limited manpower what parameters are most desired by PIs?
Question (Barnes)
The "old" Coast Zone Color Scanner (CZCS) had bands that would saturate over land and clouds. The saturation would "pull down" the voltages from the power supplies for the detectors. This effect would cause a ringing in the output band when it came out of saturation. What happens when the GLI bands come out of saturation?
Answer (Senga) Stray light is a difficult effect to characterize. It is difficult to separate several components (including the one you mention). We will work on these effects over the next year.

O-3. Anticipated Impact of GLI PFT results (Fukushima)
Handout: Not available at the time these minutes were created..
- Summarized issues raised at GLI 99 workshop:

Comment(Senga) RVS is a big problem and can only use witness sample. We are trying to get RVS characteristics from images.

O-4. Atmospheric correction algorithm for GLI ocean color bands: Current status and plans (Fukushima)
Handout: Atmospheric correction algorithm for GLI ocean color bands: Current status and plans
- Summarized work items and their current status
- Discussed progress in handling Asian dust aerosol
- Regeneration of aerosol look up table
- ACE-Asia match-up data analysis to investigate suitable aerosol modeling underway

Questions (Frouin) You mentioned IOCGG group. For comparing atmospheric codes what are preliminary results?
Answer (Fukushima) Different atmospheric correction codes behave similarly; error is still rather large due to difficult test conditions. We want to find out which cases are difficult to clarify the research target.

O-5. Global (GLI) Standard (Dr. Mitchell)
Handout: Not available at the time these minutes were created..
- Discussed need to acquire a wider range of measurements rather than just making measurements for core ocean color products.
- Global algorithm is pretty robust, but still have problems with Antarctic measurements
- Use ACE Asia Cal/Val study to practice for GLI startup
- Study showed that SeaWiFS chlorophyll was good but real problems with Water-leaving radiance

Questions (Barnes) You reported that only 1 in 10 observations for SeaWiFs are usable, is this what you expect for GLI? Can we do better?
Answer (Mitchell) I think that the answer is to put low cost autonomous systems in ocean

Question (Barnes) Is this for GLI or SGLI?
Answer (Mitchell) These technologies are still in the prototyping stage. This needs to be done by the international community not just by GLI.

O-6. Development of alternative-band algorithms for ADEOS-2 GLI ocean color products (Dr. Murakumi)
Handout: Not available at the time these minutes were created..
- Summarized GLI bands and their saturation behaviour
- Discussed results for alternative algorithms evaluated using MODIS data
- Described the use of various switching strategies to bypass noise problems

Question (Fruoin) Did you try to use the 1.05μm band for alternative atmospheric correction?
Answer (Takahashi) Ye, we tried this, but the results were noisy.
Answer (Murakumi) We will evaluate 1.05 after launch
Comment (Fukushima) Last year Greg Mitchell raised the issue about Ch 13 (678 nm) Chlorophyll fluorescence that might create problems for using this band in atmospheric corrections. Is this still an issue?
Answer (Mitchell) Chlorophyll does have strong fluorescence 670-685 nm so this should be evaluated. It is probably not a good idea to use MODIS data because of continuing issues with MODIS calibration. Introduce Chl natural fluorescence into the numerical model data set and evaluate the influence on Ch 13 (678nm)

O-7. In-water Algorithm Using Neural Network (Dr. Tanaka)
Handout: In-water Algorithm Using Neural Network (Dr. Tanaka)
- Described process for developing neural network
- Discussed underlying models, training of neural network
- Agreement of model to validation set is not totally satisfactory
- Discussed possible causes for poor validation

Question (Barnes) For training neural networks, if the training set is bad, what happens to the result?
Answer (Tanaka) NN may returns bad results
Question (Frouin) Do you take into account variations in phytoplankton types? This might increase robustness.
Answer (Kishino) Model takes into account phytoplankton type
Question (Mitchell) How does model handle coastal vs. open Ocean? You are missing terms for detritus, this may show up in total chlorophyll. Did you try running your model in the forward direction?
Answer (Tanaka) Did not try this
Comment (Mitchell) Model may not handle southern ocean very well, this may give some of the low points in your fit.

O-8. Dr. Frouin
Handout: Retrieval of pigment concentration without explicit atmospheric correction (Dr. Frouin, University of California, San Diego)
- Discussed possibility of simplifying models by writing Top of Atmosphere reflectance as a linear combination of reflectances

- Found that a linear combination of four wavelengths gave good cancellation of atmospheric effect.
- Showed results for PAR from SeaWiFs data and comparison to in situ data
- Algorithm adapted for GLI
- Discussed effect of solar flux on PAR
- Produced equations describing spherical solar flux.

Question (Kawamura) In GLI we may have saturation at wavelengths used for PAR. What does algorithm do?
Answer (Frouin) Current algorithm flags saturation and then doesn't use these values for PAR.

Land group
L-1 opening remark (Dr. Takeishi)
Handout: None
- The parallel session will start this afternoon and continue through tomorrow morning.
- This afternoon will be used for presentations by PIs and tomorrow morning will be used for discussions on future collaborations.

L-2: Dr. Toshiaki Hashimoto
Handout: Current status of LTSKG
- GCP library has been modified.
- The accuracy is about 2 km on the ground.
- Most of the error vectors point to the west.
- Magnitudes of attitude errors, which induce 1 pixel error (250m), were analyzed.
- If the geometric properties of GLI are the same as those of MODIS, (1) the modification of sensor alignments will lead to the geometric accuracy

Question: Do you have any plan to check start tracker data quality?
Answer: No.

Question: Will you use ground control points to improve the accuracy?
Answer: Yes, we will use 1,000 ground points in the world. The accuracy is very good.

Comment: GMT data are very accurate because GMT data are generated by coastal service agencies.
Comment (Tateishi) I suggest that you investigate GMT accuracy.

L-3: Dr. Craig Trotter
Handout: Development of Topographic Correction Algorithms for ADEOS-II GLI Data (Dr. C. Trotter, Landcare Research, Dr. B. Combal, Unite de Bioclimatologie)
- Topographic correction calculation was presented.
- VVM topographic effect simulations were conducted.
- A study was conducted to investigate how the topographic effect affects GLI data.

- At small Sun zenith angles and 1km pixel sizes, over areas with terrain elements small compared with the pixel size, GLI reflectance data can be considered largely unaffected by terrain (<=10%).
- GLI standard products involve band ratios, and so will be affected much less by topography- although a reduction in accuracy will occur as the Sun zenith angle begins to approach the mean slope angle (about 10%).
- To obtain accurate reflectance values when the Sun zenith angle is less than 30 degrees above the mean slope angle, for either 1km or 250m data, topographic correction is advisable.

Question: Is topographic effect affected by land cover type?
Answer: Yes, it is, but not nearly as much as by variations in view zenith or Sun zenith angle.

Comment: Global scale coverage data will be affected by topographic effect.
Answer: Yes, especially during early spring, late autumn, and winter.

Comment: The value of 30 degrees is interesting.
Answer: If the Sun elevation and mean slope elevation are approximately equal, even the GLI standard product vegetation indices will be affected quite a lot (accuracy will be reduced by more than 10%).

L-4: Dr. Nguyen Dinh Duong
Handout: Algorithm development for automated classification of land cover using multitemporal GLI data (Dr. Nguyen Dinh Duong, NCST of Vietnam)

- GASC algorithm version 8.4 has been completed. The new features are as follows; (1) Computation efficiency was improved, (2) Sub-classes of land cover category were increased, (3) Overlap problem among neighboring classes was resolved, and (4) Unknown pixels can be automatically filled.
- Dr. Duong detailed automated legend construction. Classification by automatically constructed legend requires more time than classification by manually constructed legend. However, the algorithm became sensor independent and the legend construction is not time consuming.
- Dr. Duong validated the automated legend construction by comparing the actual site information.
- Dr. Duong used MODIS data, which were taken in between June 2000 and March 2001 and applied the automated legend

Question: How do you decide categories before performing classification?
Answer: I do so based on my experience and/or field campaigns. For IGBP, there are

Question: For automated classification, do you use existing legend?
Answer: We organize legend in Vietnam. We use two legends. One is research that depends on interpretability of the dataset and the second is widely accepted such as IGBP or FAO.

L-5: Dr. Fumio Ochiai
Handout: Development of New Vegetation Indices and Algorithms for Detecting Vegetation

Changes, - Evaluation of Global Net Primary Production of Vegetation – (Dr. Ochiai, Tezukayama University, Dr. Daigo, Doshisha University, Dr. Zhang, Wuhan University)

- VIPD is a new vegetation index and stands for Vegetation Index based on pattern Decomposition Method.
- Pattern decomposition is performed using three standard patterns (pure water area, pure vegetation area and pure soil area). Pattern decomposition coefficients are produced.
- To get a relationship between VIPD and NPP, ground truth data are used.
- Dr. Ochiai collected many vegetation data for validation purposes (Canopy spectral reflector).
- Ground truth in Mongolia is underway.
- Global NPP using MODIS data will be conducted. Validation will be conducted in Kii peninsula.

Question: Do you use more than one value?
Answer: Yes.

Question: You applied rice fields and grass areas. Do you use NPP for trees?
Answer: Trees are complicated. We need more actual measurements.

Comment: Ground measurements of NPP are very difficult. We should share NPP measurements.

L-6: Dr. Kajiwara

Handout: Productivity estimation in forest area (Dr. Yoshio Awaya)

- Validation data were collected in Mt. Yatsu, Morioka, Appi, Yakutuku, Mt. Moriyoshi and Tomakomai.
- NPP of Beech in Appi was measured.

Question: What is the FOV of the instrument, which was used to measure reflectance?
Answer: FOV of my instrument is 20 degrees. But I don't know the FOV of Dr. Awaya's instrument.

L-7: Dr. Ryutaro Tateisihi

Handout: Global land Cover Mapping (Dr. Tateishi)

- There are three important factors; land cover classification system, land cover ground truth, and information extraction from satellite data.
- For classification system, harmonization among global, national and regional data is important.
- For ground truth, cooperation is important.
- For information extraction from satellite data, combining satellite information is important.
- Dr. Tateishi compared MODIS, VEGETATION and GLI.
- Dr. Tateishi proposed (1) Land group develop a standard classification system and (2) GLI land group create global land cover ground truth database.

- Ground truth must be collected for each class before establishing a standard classification system. It will be a challenge.
- For land cover ground truth database, the database should be composed of two layers of raster type data; 1st layer is land cover code and the 2nd layer is ground truth with site numbers.

Question: If spatial resolution is too high, lots of information will be missed. How do you decide spatial resolution?
Answer: We decide spatial resolution based on the needs.

Question: How do you treat mixed land cover areas?
Answer: FAO system allows land with 2 cover types. 3 or more types are not allowed with FAO system. I haven't decided as to how many types of land cover to be allowed. How to accurately describe

Comment: Landsat images are difficult to use for validating classification.

Day 3 (November 16, 2001)

Algorithm/ Validation Parallel Sessions (continued from Day 2)
Atmosphere Group (continued from Day 2)
(1) Discussion (Nakajima)

- APEX-E3 experiment in the East China Sea is the next plan for IFO in 2003.
- Validation flights for AQUA will take place in late summer to autumn.
- New instrumentation is Chinese GPS, microwave radiometer at Heifei, and regular sonde measurements by weather Ogz.
- Hatakeyama will have aircraft measurements in China.
- Algorithm development is on track.
- Encourage chemists to bring instrumentation into project.
- APEX and ACE-Asia has served as a good integration mechanism.
- AMSR L2 products needed for cloud water, water vapor, precipitation, SST.
- Skyradiometer under construction.
- Cloud tau and re are new products.

- Strategy for GLI-Atmosphere product validation is: (1) continued measurement on surface and ship (2) instrumentation for simultaneous validation and vicarious calibration, and (3) SRB validation is the final goal for GLI atmosphere remote sensing.
- Need to establish a mechanism to transfer validation data from foreign participants.
- Bright target vicarious calibration.
- Need to ask for help from foreign groups for over cloud characterization of GLI sensor.
- For snow surfaces need Ldown to help LAND.
- Discrimination of ice and water in MCR: W.
- It was agreed that the L2 system could be distributed, with PIs provided with source code if requested.
- The rstar5b problem has been resolved by setting refractive index of water.
- OCTS GAC plus POLDER data is available for April 1-10, 1997 (all sensor data). All period data of OCTS GAC is available from GAIT and can be obtained from Mukai.
- Ishigaki Island, Ariake Ferry, Mirai R/V, MOBY are possible measurement sites.

- Request MODIS: MAS data from King.
- Request European aircraft data from Dr. Verstraete.
- POLDER team needs aircraft data for cirrus characterization campaign. Isaka will provide a contact.
- The quantities for validation/vicarious calibration appear to be reasonably accurate.
- Need to solve the Chinese data delay problem. Net transfer is only available at Heifei.
- More people are needed to study Mukai's combined algorithm.
- Nobuhiro Kikuchi is set to coordinate the automatic transfer of validation data from foreign participants, including Pinker, Kassahar, and Cheju.
- Need to discuss with land and ocean group the coordination of L-up and L-down measurements.
- Find out which sites have sky radiometers.
- NASDA needs aircraft capabilities for calibration data. This is very important.
- Need an interested scientist in Vietnam.
- Ask Land Group about PAR.
- Need to find out who has the Chinese GPS data.
- It is requested that NASDA should provide more support for validation activities and GLI data analysis outside NASDA/EORC.
- Interaction between EORC and scientists should be increased.
- L2A data should be browsed.
- Support is needed for aerosol sampling at various locations.
- Need CPR/Lidar measurements from Mirai.
- Nakajima to contact Mikami concerning ADEC.

Ocean Group (continued from Day 2)

O-9. The Asian I-Lac project using GLI Ocean Color and SST (Kawamura)

Handout: Not available at the time these minutes were created..

- Outlined CEOS (Committee on Earth Observing Satellites), GOOS (Global Observing Ocean System), and COOP (Coast Ocean Observing Panel)
- Described Projects in Western Pacific (NEAR-GOOS, SEA-GOOS, GOT)
- Discussed status of Asian I-Lac project, NEAR-GOOS (data-transfer operational) and SEA-GOOS (still being organized)
- Proposed use of GLI and ADEOS-II capabilities for Asian Water Research and Monitoring

Comments (Barton)

1. History: in early days (5 years ago) IGOS included 6 preliminary projects including GODAE, Ocean Biology, Disaster Management, Forestry, and Ozone. GODAE has progressed to become the ocean theme and ocean biology was taken up by IOCCG. However, Ocean biology is not a theme in the new IGOS-P
2. At the IGOS-P meeting in Kyoto last week Arthur Dahl from UNEP in Geneva, proposed a new coral reef theme to be approved by IGOS-P. The theme was thought to be too narrow and Dahl has been asked to develop a broader coastal theme with coral reefs as an initial focus. Dahl will develop a proposal for the next IGOS-P meeting in May 2002.

Question (Frouin) Why would you develop a separate GLI project to add into Asian I-Lac?
Answer (Kawamura) This is a new trial involving the UN/IOC group to establish a sustainable ocean color monitoring. OCTS and SeaWiFS have proven the ocean color capabilities in the open ocean, and demonstrated its potential for the coastal water research as well as a huge volume of data. The next step should be from the remote sensing for researches to the oceanography tool for monitoring and applications for the global change, which also includes more researches. We need the GLI data as rather free data source.
Comment (Mitchell) We need better data to improve algorithm. Algorithm for coastal waters is more difficult. There is a big gap between realistic algorithms and the capabilities of many of the Asian investigators to obtain the necessary data. This is true even for established PIs where a wider range of measurements is needed. We need to be cautious about what is promised; can't promise products if Asian investigators can't deliver the quality observations required to tune the algorithms.

Comment (Kawamura) There is not a lot of optical oceanography in this region, but there is some infra structure that can be built on to study case 2 water.

Comment (Mitchell) POGO (partnership for observing global oceans) meeting of institute directors may provide a means of getting ocean color to next level. We will add Asian I-Lac to minutes as an example.

Comment (Takahashi) There is a range of different levels of organization. Scientists can potentially contribute to a number of levels.

Discussion Topics (Dr. Mitchell)

(1) Algorithm: Chl – GLI is OK for Japanese Data
- Southern Ocean is not well described. SIO hosting polar algorithms workshop 9/02
- Case 2 still has many problems. Need more data and new algorithm concepts

(2) CDOM – GLI algorithm under-predicts Japanese data
- Does Western Pacific have more CDOM than East Pacific (CalCofi data)
- Evaluate methods, fitting
- Merge data for more robust parameterization
- Inverse models and neural networks show promise
- Need more work on forward model
- Need more data with SS, bb, a etc with Rrs and Chla

(3) Cal/Val
- Use ACE-asia/SeaWiFs/MODIS as test; recommend NASDA look at ACE-Asia as a test case for GLI initialization
- 2-3 teams post launch GLI to get integrated observations
- Comprehensive observations
  - in water optics
  - water property analysis
  - atmospheric optics
- Rely on existing cruise schedules rather than planning dedicated cruises
- One SIO team:
  - ocean bio-optics – Mitchell

- atmospheric/calibration –Frouin
- collaborate with CICESE/IMMECOCAL (Mexico)
- April and July 2003 initialization
  - Calcofi – PRR800, bb, ap/as/ad, Chl, HPLC, SIMBAD, uTOPS, PREDE
  - IMMECOCAL – PRR 600, ap/as/ad, Chl (HPLC), SIMBAD, (uTOPS)

O-10. Achievements and Activities FY01 of SIMBIOS Project (Robert Barnes)
Handout: Achievements and Activities FY01 of SIMBIOS (Drs. McClaim and Fargion, NASA GSFC)

- Discussed philosophy of SIMBIOS
- Reported on progress in merging data from SeaWiFS, MODIS and MOS
- Merging data gives improved data coverage
- Advocated early and planned extraction of diagnostic data sets
- Described SIMBIOS capabilities

Comments (Ishizaka) Diagnostic data sets are important, already have input into SIMBIOS data sites

Question (Takahashi) How do you maintain long-term calibration?
Answer (Barnes) We use yearly calibrations of SeaWiFS transfer radiometer.
Question (Kawamura) How long will SeaWiFS last?
Answer (Barnes) SeaWiFs may work forever. Currently in 4th year of 5 year funding. Prospects for renewal are good based on congressional interest in Global warming. Possible new SeaWiFs type instrument will be launched about 2007.

O-11. The Australian Region GLI Validation Program (Ian Barton for Mervyn Lynch)
Handout: The Australian Region GLI Validation Program (Associate Prof. Lynch, Curtin University of Technology)

- Described plans for GLI Ocean color plans
- Briefly described other activities: Monti Carlo simulations, turbidity measurements and instrument development

Question (Ishizaka) Are the Perth-Singapore transects on merchant vessels?
Answer (Barton) Yes, they are currently underway taking measurements of thermoselenity, fluorescence overseen by student.

O-12. The spectrometer comparison experiment (Preliminary results from KY01-09) (Dr. Nieke)
Handout: The spectrometer comparison experiment (Preliminary results from KY01-09) (Drs J. Nieke and Asanuma, NASDA, and Dr. Takahashi, RESTEC)

- Described performance of WLR-2800 spectrometer, measurements on RV Kaiyo and installation on Isigaki buoy
- After correcting for difference in calibration between WLR-2800 and TRIOS spectrometers found good agreement in VIS but significant differences in NIR

Question (Frouin) Did you use 45 degrees angle (which has problems with sky reflectance)?
Answer (Takahashi) Angle is between (35 degrees and 45 degrees).

Question (Frouin) Will you be able to compare with an underwater measurement?
Answer (Neike) Yes, we have Freefall
Question (Frouin) On the buoy can you control orientation of instrument?

Dr. Senga proposed action item: We should publish basic characteristics prior to launch, but have many huge data sets still to analyze, we want to publish a user handbook for the hardware including basic S/N, scan angle dependence, polarization, over saturation characteristics, propose to include only an example.
Fukushima: What is possible impact on post launch initialization?

Question (Neike) The ground signal is very bright. What is the percentage of the aerosol contribution?
Answer (Stamnes) Channel 5.6 is very sensitive to impurity

Cryo QUESTIONS

Question (Nakajima) Did cryo group retrieve aerosol data also?
Answer (Stamnes) Yes.

Question (Senga) You used 1.38 um, but there is a problem with the calibration of this channel. What accuracy is acceptable?
Answer (Aoki) We used simulated data without noise.
Comment (Nakajima) Issues are reproducibility and absolute calibration. Absolute calibration can be addressed on orbit by comparison with MODIS.
Comment (Stamnes) This is not just a cryo problem.
Comment (Ackerman) We don't use the 1.38 um band in all cases. In MODIS have leakage between channels, use 2.2 μm
Question (Stamnes) Is it possible to use another channel instead of 1.38?
Answer (Ackerman) We look to 2.2 um channel

Question (Teruyuki Nakajima) Does the land group plan on retrieving emissivity?
Answer (Barton) It is implicit in algorithms, currently implementing new Look up table for GLI response.

Question (Teruyuki Nakajima) Do you have a fPAR sensor for validation site?
Answer (Barton) not sure if Fred Prata has instrument for fPAR at his site.

Land Group (continued from Day 2)
The group discussed the following topics.
(1) Products
- Accuracy of DN and registration of DN to final products are important
- Land group will need atmospheric corrected products. The issue is delivery timing. In the current plan, NASDA will supply atmospherically corrected data about 2 years after launch.
- Atmospheric correction is very important for vegetation.
- Dr. Duong: Land cover map using GLI 250m data. 1-year data will be required. It will take Dr. Duong three months to generate the map.

- Dr. Yoshioka: Out product is 16-day composite product reflectance data without atmospheric correction. With EVI and NDVI, atmospheric correction will be performed. Launch will be November 2002 and a field campaign will be Summer 2003. NASDA will be able to perform atmospheric correction one year after the launch. If atmospherically corrected data is supplied within 18 months, the Land group will be happy.
- Dr. Fujiwara's products: Pattern decomposition software has been delivered. Classification chart and NPP of Kii Peninsula and the entire globe. NPP is the final product.
- Dr. Tateishi's proposed global standard system on land cover classification system. Action item: Dr. Tateishi will provide detailed descriptions of the proposed global standard system on land cover.

(2) Cooperation
- Dr. Honda recommended the land group to request NASDA to install a ground station in Israel to receive 250m data. This will help to eliminate areas, where GLI data are not available; e.g., Asia, South Africa and South America.
- Dr. Tateishi proposed that the Land group land cover ground truth and create products that are land cover code and site numbers. Dr. Tateishi proposed that Latitude/ Longitude should be used for coordinate system. ETRF/GR84 is the same of WGS84. 30 seconds or less. The site numbers are linked to the information source. We have agreements with Japan, China and Middle East. Dr. Duong suggested that the Land group collaborate with MODIS ground truth, which has 8 ground truth sites.
- Dr. Honda's products: 250m products are recommended 1 sec.

(3) Other activities

(4) Summary report
- Use Dr. Trotter's software for topographic correction.
- Dr. Tateishi proposed global standard system on land cover classification system
- The group agreed to negotiate with MODIS team about ground truth site

Action item: Dr. Tateishi will provide Dr. Duong with a detailed implementation plan with data.

34. Dr. Stamnes

Handout: Not available at the time these minutes were created..
- Dr. Stamnes presented the theoretical aspects and retrieval principles of snow grain size retrieval. Channels 5 and 26 are used.
- Atmospheric correction is performed by removing aerosol effect. Results of atmospheric correction were presented.
- Dr. Stamnes conducted validation using synthetic data.

Question (Teruyuki Nakajima) Atmosphere doesn't think about clouds over snow.
Answer (Stamnes) Cryo group is thinking to detect clouds over snow.

Comment (Teruyuki Nakajima) So, we can retrieve several sizes.

Summary Session

35. Cryosphere Group Report (Dr. Aoki)

- The following three issues were discussed in the group meeting.

(1) "Algorithm performance tests for the future development" by Masahiro Hori
(2) Improvement of snow BRDF model using non-spherical ice particles
(3) Evaluation of the validity of the atmospheric and aerosol models in CTSK2b1 for atmospheric correction.

- Joint field experiment at Saroma, Hokkaido is scheduled for 2002.

36. Land Group Report (Dr. Tateishi)

Handout: Not available at the time these minutes were created..

- Vicarious calibration: The land group needs high brightness targets such as desert. It is possible to use the test sites prepared for land validation (Mongoria, Amburla (Australia), Jornada (U.S.A.)).
- The group would like to request for receiving 250m data of Central Asia to cover the whole Asia.
- The land group identified research products (global-1km, Asia-250m, Indo-China-259m, Kii Peninsular- 259m); land cover, software for the correction of terrain effect, NPP, land surface temperature and fear.
- It is important to develop a methodology to measure vegetation biophysical parameters.
- The land group wishes to collaborate in developing global land cover ground truth database.
- The land group wishes to collaborate in validating geometric correction by GPM measurement.

37. Ocean Group Report (Dr. Ishizaka)

Handout: Not available at the time these minutes were created..

- NASDA investigated alternative bands. The results seem satisfactory, but need further investigation.
- Importance of improving atmospheric correction algorithm was recognized.
- There has been significant improvement with Case II algorithm.
- CDOM algorithm should be further studied.
- NASDA and PI should start End-to-end test of CAL/VAL.
- Coordination of international Cal/Val activities should be explored.
- Above water measurement is promising.
- The Ocean group recognizes usefulness of 250m data for coastal applications.
- Asian I-LAC is necessary for validation of Asian waters.
- The Ocean group recommended implementation of GLI data to SIMBIO diagnostic data set.

38. Ocean Group Report (Dr. Teruyuki Nakajima)

Handout: Not available at the time these minutes were created..

- L2A should be accompanied with browse data.
- EORC should support grass-roots activities by scientists for supporting GLI mission. Especially EORC's computer system has very tight security, GLI research.
- Cloud is a big problem. NASDA needs aircraft capability for calibration.

39. Algorithm Implementation discussions (Dr. Fukushima)

Handout: Not available at the time these minutes were created..

- Dr. Fukushima presented the members of GLI algorithm integration team, launch readiness,
- Standard solar irradiance data will be available on the GLI web.
- Alternative band scheme works well against the low saturation band issue.
- The algorithm team proposes that the team collaborate with the calibration team to determine research priorities.
- The algorithm team recommends that NASDA clarify the contacts at EORC (or discussion in the GLI team leader meeting recommended).

Comment (Teruyuki Nakajima) One is a security issue and the other is illegal access to the EORC computer system.

Comment(Ishizaka) In-accessibility is a big problem. Cal/Val scientists cannot provide data to EORC. Other data providers cannot supply their data to EORC.

Comment (Mukaida) The computer system at RESTEC can supply Cal/Val data via ftp. EORC system can send data out, but doesn't receive data from outside.

Recommendation: MUD processing software be made available for PI.

Action item 5: NASDA should provide a list of points of contact with regard to software support/ distribution.

Action item 6: NASDA should investigate an efficient mechanism or arrangement for PIs to perform calibration/validation activities.

40. Calibration discussions (Dr. Senga)

Handout: Not available at the time these minutes were created..

- Publish details of pre-flight characteristics and on-board behaviour as "Technical Report" as soon as possible.
- Further analysis for PFT and MDET (huge dataset)
- Prepare calibration data archiving system.

Comment (Hori) Real snow reflection is not as polarized as predicted by simulation.

41. Validation discussions (Dr. Takamura)

Handout: Not available at the time these minutes were created..

- Dr. Takamura summarized the validation discussions.

42. Status of Action Items from Previous Workshop (NASDA Mr. Kurihara)

Handout: Action Items at GLI Workshop 2000 (Mr. Kurihara, NASDA)

A/I No.1 (Session9): NASDA EOPD will investigate data policy on "registered users" other than PIs. Standing order should not be limited to PIs. NASDA EOPD will evaluate the impact.

Answer:

- Tentative ADEOS-II data policy has been presented. Basically, ADEOS-II data will be provided at reproduction costs. Data will be provided at PIs and cooperative researchers free of charge. Commercial data distribution policy will be determined later.
- The same data policy will apply to registered users. He also mentioned that standing order service would be available to registered users, as well.

Status: Closed

A/I No.2 (at Plenary Session 9): NASDA EOC will investigate if NASDA EOC plans to add other media such as DVD (Due date: March 2001).

Answer:

(1) NASDA EOC is planning to adopt the following data media

- DVD-R (4.7GB, instead of 8mm tape media)
- DLT-8000 (40GB, instead of DLT-7000 media)

(2) Supplement of new drives will be carrying out with the increase of data distribution facilities. Increase of capacity will be necessary until the start of the data distribution to the public (1year after launch)

(3) The following data media will not be adopted because these are not wide used enough

- Mammoth (20GB, 40GB, 60GB)
- Super DLT (110GB)
- LTO Ultrium (100GB)

Status: Closed

A/I No.3 (session19): NASDA will provide the following items via ftp from its web site:

(1)MODIS conversion software
(2)data access tool
(3)user's manual for (1) and (2)
(4) L1B file format description

Answer: Neither (1) nor (2) will be available via FTP. Item (3) will be posted on PIS DOOR in a week. Item (4) has been already posted on PIS DOOR.

Status: Closed

A/I No.4(Session 21-3): NASDA will investigate if NASDA can generate MUD from L1A not L1B

Answer: L1A MUD is not available. There are too many modifications to be required.

Status: Closed

A/I No.5: PIs should submit standard algorithms (launch version)& ATBD by the end

March 2001
Answer: Standard algorithms have been already submitted. Some ATBD are still to be submitted. New version of ATBD should be submitted by 31 March 2002.
Status: Open

A/I No.6 (Session 23-1): Group leaders will send request for procuring equipment that will be required for validation, to Dr. Takamura by e-mail
Answer: Check with Dr. Takamura.
Status: Open

A/I No.7: NASDA will provide general information on EORC web site such as timeline.
Answer: NASDA have made the web site. GLI homepage is a part of NASDA EORC homepage. URL http://www.eorc.nasda.go.jp
Status: Closed

A/I No.8: NASDA will build the web site that will serve for PIs to archive validation data. The web site will allow PIs to store and retrieve validation data.
Answer: NASDA will build a web site for validation data. PIs can get validation data, not send data to the web site due to security concerns.
Status: Open

A/I No.9: NASDA will add another simulation case, regarding GLI 250-m data coverage, which includes one or two receiving station in South America.
Answer: This action has been superseded with a new action item created in this meeting. This item is closed.
Status: Closed

A/I No.10: NASDA will check GSD clear sky radiance.
Answer: NASDA has checked and the issue has been resolved.
Status: Closed

A/I No.11 (Ocean): NASDA and Cal WG should study PFT results and possibly with additional test for correcting satellite data and predicting magnitude of error. The results should be reported to the GLI PI team.
Answer: The results were reported in this workshop. This item is closed.
Status: Closed

A/I No.12 (Land): The ocean and land groups will discuss a possibility of extending its algorithm for use over land at day and night.
Answer: Dr. Prata is still to provide his algorithm to the ocean team. After receipt of the algorithm, GAIT will evaluate the algorithm.
Status: Open

A/I No.13 (Land): Dr. Prata will send a change proposal to NASDA regarding a change of SST scheme for use over the land.
Answer: This item is a duplicate of No.12. This item is closed.
Status: Closed

A/I No.14(Land): NASDA and PIs will investigate a feasibility of above action item 13.
Answer: Closed
Status: Closed

A/I No.15: All participants will review and comment on draft minutes.
Answer: Closed
Status: Closed

A/I No.16: NASDA will update algorithms.
Answer: Closed.
Status: Closed

43. Summary of the Workshop (Prof. Teruyuki Nakajima)

Handout: Summary of GLI WS2001 (1) (Dr. Teruyuki Nakajima, University of Tokyo)

- Prof. Nakajima summarized the entire workshop and identified action items as follows.

■ Hardware
  - ➤ A/I: Study more details
    - Sensitivity decay over saturation range: flagging
    - Reflectivity/Polarization sensitivity vs. scan angle
    - Stray light/BT recovery
  - ➤ A/I: GLI characterization data should be opened to PI s
  - ➤ Calibration data archiving system (EOSD)

■ Algorithms
  - ➤ Excellent: We appreciate GAIT efforts and other related groups
  - ➤ Alternative band algorithms under development

■ 250m data
  - ➤ A/I: More survey and effort for better coverage; More candidate facilities have been suggested
  - ➤ Hebrew University has a plan of SeaSpace receiving station (10m).
  - ➤ RC: NASDA should encourage commercial enterprises to have functions of GLI data acquisition

■ No L2A browse (Shimoda)
  - ➤ NASDA said that there was no requirement
  - ➤ RC: PI team also recommends

■ A/I: Investigate the scientific result of the L1 simulation test

■ GLI standard extraterrestrial irradiance
  - ➤ A/I: Spectrum for $\lambda > 3$ μm
  - ➤ A/I: Response function-weighted irradiance

■ Data transfer from EOC to EORC
  - ➤ All L1B data
  - ➤ A/I: Investigate the possibility of some temporary files transfer (4 day minimum radiances, Atmospheric L2A-segment)

- Data and software information
  - A/I: NASDA should provide a list of points of contact with regard to software support/distribution
  - Define the available software: MODIS to GLI formatter

- EORC data availability to PI s and collaborators
  - Access from PI to help NASDA is important
  - RC: Improve the present security system which is not efficient for research work.
  - A/I: Identifying the contact point
  - Through ftp OK
- Validation activities
  - RC: Offer maximum conveniences to collaborators
  - Only PI through ftp: Is this OK? (MUD, in situ data); web for scatter plots
  - A/I Seek a mechanism to transfer match-up GLI data to in situ data providers
  - RC: Validation working mechanism between CAL/VAL G. and in situ data providers
    - Define mechanism
    - Software support
- A/I: Need to make a protocol and format for query of data transfer from in-situ data providers
- Coordination of vicarious calibration
  - Define IFOs
  - Land, Ocean-Atmosphere coordination of L-up and L-dwn
  - Bright target calibration:
    - Desert and aircraft