3.1.3 ATSK3 _e

A. Algorithm Outline

(1) Algorithm Code: ATSK3_e

(2) Product Code: CLER_i_e, CLOP_i_e, CLTT_i_e

(3) PI names: G-0060 Teruyuki Nakajima

(4) Overview of algorithm (Status: Standard level)

The objective of this algorithm is to retrieve optical thickness and effective particle radius of upper thin clouds from GLI multi-channel radiance (3.7, 10.8, 12.0 μm) in night time.

B. Theoretical Description

(1) Methodology and Logic flow

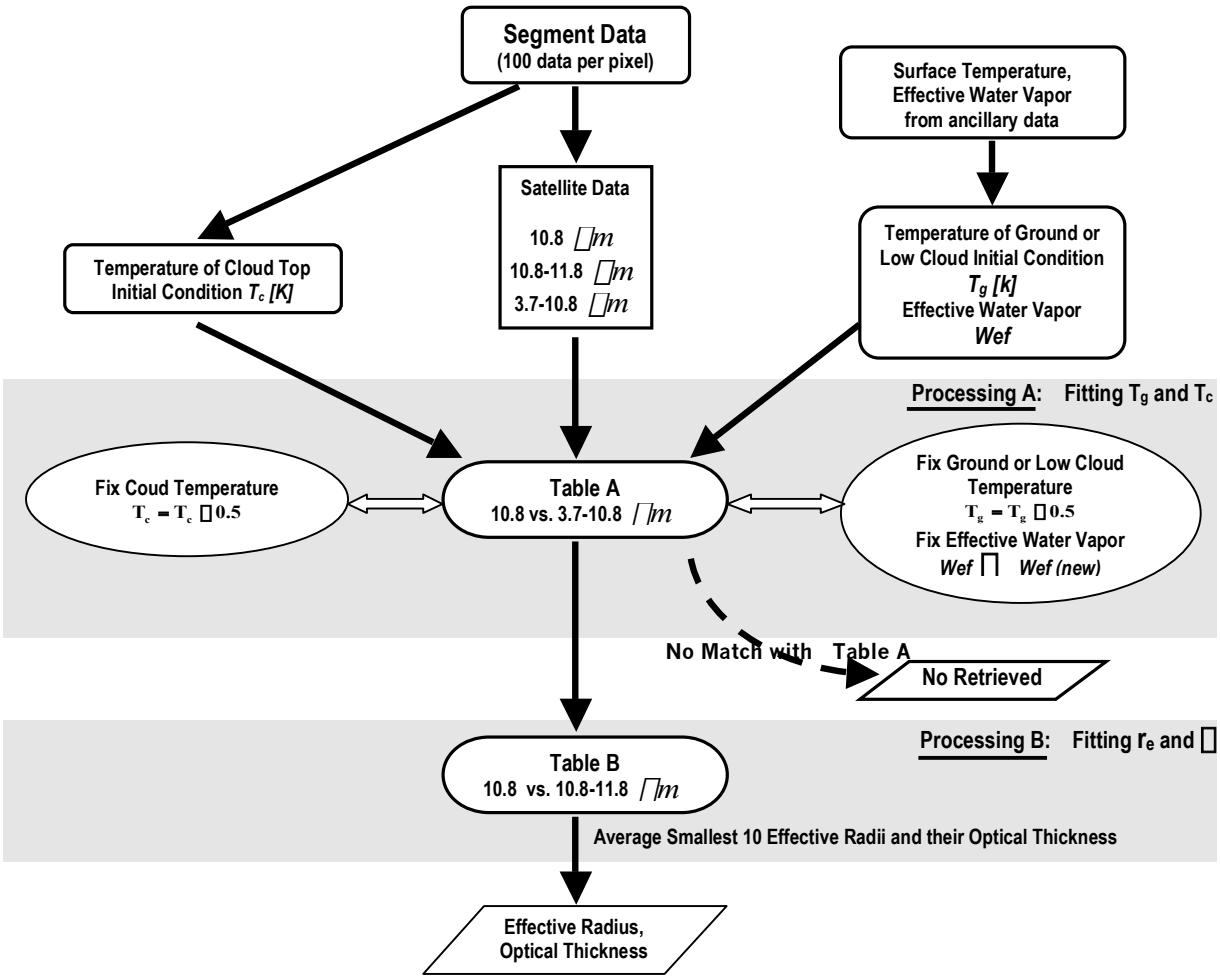

Fig.1 The flow chart of the retrieval algorithm.

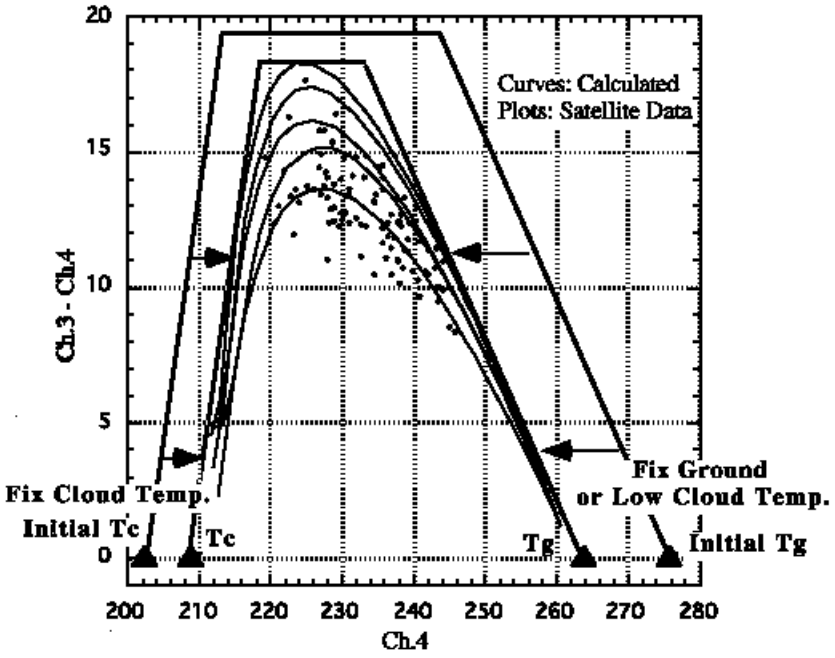

Table A: Ch.4 vs. Ch.3 - Ch.4

Concept of Fixing Foot of Arch

Fig.2 The concept of the table fitting

The example of processing A in Fig. 1, here, Ch3=3.7 □*m* , Ch4=10.8 □*m* , Ch5=11.8 □*m*

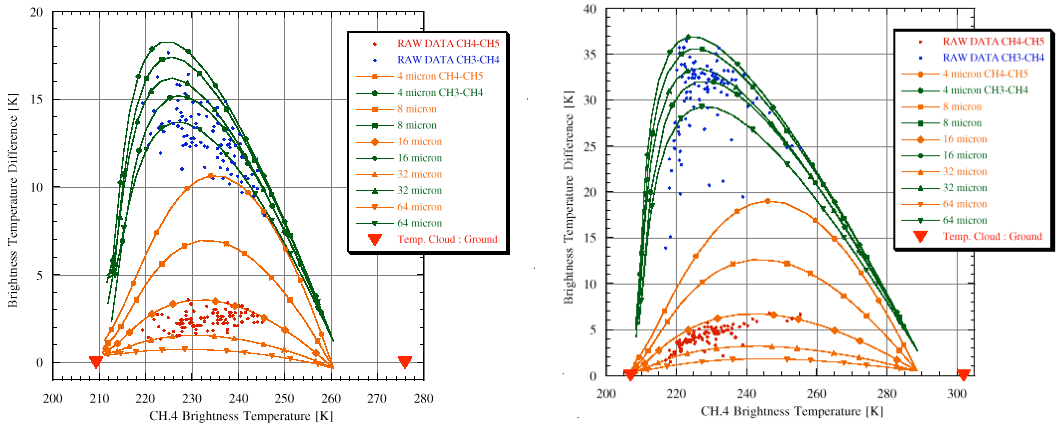

Fig.3 Examples for the table in Algorithm and the raw data in Testrun (AVHRR)

here, Ch3=3.7 □*m* , Ch4=10.8 □*m* , Ch5=11.8 □*m*

Thin cirrus cloud microphysical parameter retrieval:

This algorithm can retrieve thin cirrus cloud microphysical parameters, effective particle radius, optical thickness and cloud top temperature from 3.7, 10.8, 12.0□m channels. Figure 1 illustrates the flow of the algorithm. And Fig. 2 is the illustration of the finding process (A in Fig.1) of cloud top temperature and the surface temperature (or the cloud top temperature of the cloud lying under the high cloud). Fig. 3 shows the examples for the Look-up Table in the algorithm and the row data in testrun (AVHRR).

(2) Physical and Mathematical aspects of the algorithm

Cirrus Cloud Algorithm

- Purpose: to retrieve the cloud optical thickness $\tau_{0.5}$ and the effective particle radius r_e for cirrus clouds.
- Used GLI channels: 3.72, 10.8, 12.0μm
- Observation conditions: ocean and land, nighttime

C. Practical Considerations

(1) Programming, Procedural, Running Considerations

Program Requirements: The following table shows information about the expected software generated from this algorithm.

Program Memory	50962 pages=50962 × 16384 bytes=834961408 bytes
Program Size	63211 bytes
Required Channels	3.7, 10.8, 12.0μm channel
Necessary/Ancillary Data	Profile of the temperature, water vapor, pressure
Expected Disk Volume	
Special Programs or Subroutines	

(2) Calibration and validation

(3) Quality Control and Diagnostic Information

(4) Exception Handling

(5) Constraints, Limitations, Assumptions

(6) Publications and Papers

D. References

1.