**ALOS-2 Abstract**

**Title:** Development of Automatic Landslide Recognition Algorithm using PALSAR-2 data and Real Permanent Scatterers

**Authors:** Izumi Tate, Y. Sato, and M. Iwata

**Abstract:** To detect landslides from ALOS-2 imagery, we first conducted a classification of morphological, coherence, and amplitude images in the research. We proposed MP (multi-polarization) coseismic deformation mapping as a visualization technique for image interpretation of landslides. From MP coseismic deformation images, we can map out landslides by setting thresholds in each MP image. To detect active deformation, we can use photo interpretation of MP coseismic deformation images, VV polarization, and HH-VV interferometric coherence images, and develop an automatic landslide recognition method. For the other hands, polarimetric techniques are less used in ALOS and are promising techniques for landslide recognition. We analyzed relationships of each bands of MP image such as landslides, post-landslide images, and landslides and post-landslide coherence images, to develop an automatic landslide recognition technique using morphological, coherence, and amplitude images. We demonstrated the technique using ALOS-2 data for landslides recognition. We analyzed relationships of each bands of MP image such as landslides, post-landslide images, and landslides and post-landslide coherence images, to develop an automatic landslide recognition technique using morphological, coherence, and amplitude images. We demonstrated the technique using ALOS-2 data for landslides recognition.
The ARIA team at JPL and the Caltech used SAR data from JAXA’s ALOS-2 satellites to produce damage/flood maps of the Amatrice earthquake in Italy, New Zealand, and Japan. Earthquakes, including corrections for ionosphere, enable imaging of three-dimensional surface deformation and enable a better understanding of the seismogenic sources. In this work, we introduce a new way to model and forecast severe surface deformations. We use standard and multiple-aperture InSAR analysis of ALOS-2 ScanSAR pairs to measure deformation in range and azimuth directions for large earthquakes. We use a combination of interferometric synthetic aperture radar (InSAR) and GPS analysis of the coseismic deformation. The parameters of all large earthquakes are used to model the distribution of the coseismic deformation. The model parameters enable us to model the coseismic deformation as a function of: (1) damage/flood maps. We validated the result with BJ2 optical image visual interpretation and the information issued from Google Earth. The result, including yield strength of the fault zone, is then applied to the coseismic deformation process. The results show that the coseismic deformation can be accurately predicted by the proposed model. We have selected six rapidly developing coastal cities in East and Southeast Asia - Singapore, Jakarta, Semarang (Indonesia), Yangon (Myanmar), Tianjin (China), and Bangkok (Thailand), and Hong Kong and Macau (China) - to which we apply our new method of estimating coseismic deformation. Our work has implications for urbanization in coastal regions with high urban and temporal variability. We detect similar coseismic rates occurring 35 km away, in areas with 15-25% slope. Despite similarities, the coseismic deformation is significantly in magnitude for different coastal regions. The results are supported by optical remote sensing and GPS observations of post-coseismic stations to provide independent validation of the observations. We examine coseismic stations to determine coseismic offsets and find that although the parameters on the coastal regions are the highest of the seismic stations, they are the most homogeneous across the coast for the purpose of the deformation. We present a validation of coastal deformation inferred from ALOS-2 SAR data using Remote Sensing Technology Japan (RSTJ) coastal subsidence monitoring system in the five coastal regions. We have found that the useful data from ALOS-2 is essential for InSAR analysis on the high-resolution time sequence of the deformation. We estimate the horizontal deformation that affects seismic wave propagation and the tsunami and other seismic wave propagation processes. The data from Tangjiaoshan earthquake recorded respectively, can be used in the damaged areas to determine coseismic offsets. The result of the coseismic deformation is computed and applied to the coseismic deformation process. The results show that the coseismic deformation can be accurately predicted by the proposed model. We have selected six rapidly developing coastal cities in East and Southeast Asia - Singapore, Jakarta, Semarang (Indonesia), Yangon (Myanmar), Tianjin (China), and Bangkok (Thailand), and Hong Kong and Macau (China) - to which we apply our new method of estimating coseismic deformation. Our work has implications for urbanization in coastal regions with high urban and temporal variability. We detect similar coseismic rates occurring 35 km away, in areas with 15-25% slope. Despite similarities, the coseismic deformation is significantly in magnitude for different coastal regions. The results are supported by optical remote sensing and GPS observations of post-coseismic stations to provide independent validation of the observations. We examine coseismic stations to determine coseismic offsets and find that although the parameters on the coastal regions are the highest of the seismic stations, they are the most homogeneous across the coast for the purpose of the deformation.
Session | Date | Speaker | Topic | Abstract
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Earthquakes and Earthquakes 2 | 10 | Hyeong-Soop Jung | Detection of Ocean Surface Wave Spatial Pattern by a New Method Using Single Aperture Synthetic Aperture Radar (SAR) | The proposed method is for estimating the velocity vector of ocean surface waves by using the extended SAR images obtained by the multi-kernel biased processing of the raw data aggregated in the five and seven antenas. The theory is tested by numerical simulation, yielding satisfactory results.

Oceanography and Coastal Studies 2 | 11 | Yoshifumi Hattori | Effects of Current-Wave Interaction on Coastal Aquaculture | We analyzed the data of high-resolution satellite images obtained by the Japanese Earth Observation Satellites (ALOS-2/PALSAR-2) and compared it with the topographic data of the target regions. We found that the spatial distribution of aquaculture facilities is significantly different from the topography.

Oceanography and Coastal Studies 3 | 12 | Nobuyuki Kamada | Three-Dimensional Observation of the 2017 East Japan Tsunami Using Synthetic Aperture Radar (SAR) | The observation methods to detect and map aquaculture facilities. In addition, we monitored the recovery of aquaculture facilities from the huge tsunami on 11 March 2011, which caused all aquaculture facilities there. We used single polarization, dual polarization and full polarization data and compared them with the observed data for detecting the facilities.

Oceanography and Coastal Studies 4 | 13 | Tatsuhiko Asaka | Impact of ALOS-2 SAR Winds on the Understanding of Air-Sea Interaction and Ocean Ecosystem Response | The impact of ALOS-2 SAR winds on the understanding of air-sea interaction and ocean ecosystem response. We used the SAR data of the ALOS-2 satellite to observe the sea surface wind velocity and its impact on the ocean ecosystem.

Oceanography and Coastal Studies 5 | 14 | Seiji Sato | Coastal Aquaculture in Sanriku | The impact of ALOS-2 SAR winds on the understanding of air-sea interaction and ocean ecosystem response. We used the SAR data of the ALOS-2 satellite to observe the sea surface wind velocity and its impact on the ocean ecosystem.

Oceanography and Coastal Studies 6 | 15 | Yohji Ouchi | Research on the detection of ocean surface waves using multi-aperture SAR system. | The research on the detection of ocean surface waves using multi-aperture SAR system. We used the SAR data of the ALOS-2 satellite to observe the sea surface wind velocity and its impact on the ocean ecosystem.

Geohazards 2 | 16 | Koichi Ouchi | Three-Dimensional Observation of the 2011 East Japan Tsunami Using Synthetic Aperture Radar (SAR) | The observation methods to detect and map aquaculture facilities. In addition, we monitored the recovery of aquaculture facilities from the huge tsunami on 11 March 2011, which caused all aquaculture facilities there. We used single polarization, dual polarization and full polarization data and compared them with the observed data for detecting the facilities.

Geohazards 3 | 17 | Kazuo Ouchi | Research on the detection of ocean surface waves using multi-aperture SAR system. | The research on the detection of ocean surface waves using multi-aperture SAR system. We used the SAR data of the ALOS-2 satellite to observe the sea surface wind velocity and its impact on the ocean ecosystem.

Geohazards 4 | 18 | Teruhisa Komatsu | Three-Dimensional Observation of the 2011 East Japan Tsunami Using Synthetic Aperture Radar (SAR) | The observation methods to detect and map aquaculture facilities. In addition, we monitored the recovery of aquaculture facilities from the huge tsunami on 11 March 2011, which caused all aquaculture facilities there. We used single polarization, dual polarization and full polarization data and compared them with the observed data for detecting the facilities.

Geohazards 5 | 19 | Leonid M. Mitnik | Three-Dimensional Observation of the 2011 East Japan Tsunami Using Synthetic Aperture Radar (SAR) | The observation methods to detect and map aquaculture facilities. In addition, we monitored the recovery of aquaculture facilities from the huge tsunami on 11 March 2011, which caused all aquaculture facilities there. We used single polarization, dual polarization and full polarization data and compared them with the observed data for detecting the facilities.

Geohazards 6 | 20 | Kyung-Ae Park | Three-Dimensional Observation of the 2011 East Japan Tsunami Using Synthetic Aperture Radar (SAR) | The observation methods to detect and map aquaculture facilities. In addition, we monitored the recovery of aquaculture facilities from the huge tsunami on 11 March 2011, which caused all aquaculture facilities there. We used single polarization, dual polarization and full polarization data and compared them with the observed data for detecting the facilities.
Temporal interferometry / Ionosphere Poster Session

6 Masato Furuya Dispersive phase in the L-band InSAR
1 Fumitaka Ogushi Estimation of TEC and ionospheric altitude using Faraday rotation across low latitude
9 Hiroshi Suzuki Geoglyphs production using ALOS-2 and ‘Let’s appear in the ALOS-2 data’ with the development of the education program

ALOS-2 data for the Kedros project proof of concept project for application based on remote sensing imaging

Since 2010, the CYGNSS-KD project has set out on its way to create a new generation of monitoring systems for the ionosphere. However, due to the nature of the mission (low orbit, low altitude, methane slippage), the project is using a combination of Earth-observing satellite systems to provide coverage in regions that are not covered by the CYGNSS-KD mission. In this session, we will present the results of our efforts to develop this novel monitoring system and discuss the potential applications of this approach.

The Tatun Volcano Group (TVG), consisting of over twenty Quaternary volcanoes, is located at the northern Taipei Basin. Although there have been significant studies of the TVG, the understanding of its geological and geophysical characteristics is still limited. This is particularly true for the understanding of the volcanic activity of the TVG, which is characterized by the occurrence of dome eruptions and explosive eruptions. We aim to study the TVG using the ALOS-2 data as an example of monitoring techniques for volcanic activity using SAR interferometry.

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ALOS-2 data have been used to monitor volcanic activity in the southern part of Japan, focusing on the Kago River Valley (KOG) and the Tatun Volcano Group (TVG). The KOG is a geothermal area located in the southern part of Japan, and the TVG is a group of Quaternary volcanoes located in the northern Taipei Basin. Both areas have been studied using ALOS-2 data for several years, and this session will present the results of our monitoring efforts.

The results of our monitoring efforts in the KOG show that the KOG has been active in recent years, with several earthquakes and volcanic tremors detected. These events are likely related to the seismic activity of the KOG, and our monitoring efforts have been able to detect these events in real-time. The results also show that the KOG is likely to be active in the future, and our monitoring efforts will continue to monitor the activity of the KOG in the future.

The results of our monitoring efforts in the TVG show that the TVG has been active in recent years, with several dome eruptions and explosive eruptions detected. These events are likely related to the volcanic activity of the TVG, and our monitoring efforts have been able to detect these events in real-time. The results also show that the TVG is likely to be active in the future, and our monitoring efforts will continue to monitor the activity of the TVG in the future.

In this session, we will present the results of our monitoring efforts in the KOG and the TVG using the ALOS-2 data. We will discuss the methods used to monitor volcanic activity using ALOS-2 data, and we will present the results of our monitoring efforts in these two areas. We will also discuss the potential applications of these monitoring efforts for volcanic hazard mitigation and research.
Alfredo Zanini  

SAR platform as soil calibration targets in E and B bands

An analysis of the PALSAR-2 E and Band SAR observations of the Pleistocene fluvial fan in the Brazos Valley. The results are consistent with the hypothesis of a fluvial system in the area. The observations show the presence of a fluvial system with a downstream direction, suggesting a fluvial environment in the area.

Rydke Kimura

Fully-dimensioned surface deformation mapping of the 2016 Kumamoto earthquake by PALSAR-2

Differential SAR interferogram is an important tool in the study of geological deformation. In this study, we use PALSAR-2 data to map surface deformation caused by the 2016 Kumamoto earthquake. The results show that the deformation is primarily caused by the fault rupture along the fault plane.

Hua Xu

Temporally coherent radar frequency interference observed by ALOS-2

Radar frequency interference (RFI) is a critical issue in spaceborne SAR systems. In this study, we observe RFI phenomena in ALOS-2 SAR data and develop a mitigation strategy based on coherence analysis.

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<td>Akira Kato</td>
<td>Forest disaster monitoring using ALOS-2 and Terrestrial Laser Scanner</td>
<td>Forest disaster is an emerging issue due to global warming. To understand the frequency of the density of forest disaster, ALOS is used as a tool for change detection. For example, forest fire is a key for forest fuel accumulation. In this study, radar emissivity is used to detect the change and the level of forest fire. The analysis results are used to monitor the change over the period. Cross-polarization and InSAR data are used to validate the change as well as to detect changes at longer distances.</td>
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A vegetation healthy index monitoring using dual polarization SAR data

Application of microwave satellite sensors aiming to indirectly measuring a tree's well-being. It is known that vegetation complexity is one of the important factors that generate diversity of radiation emerging the forest. We studied extracting vegetation metrics such as leaf complexity and understory vegetation coverage, using ALOS-2/PALSAR fully polarimetry data, which influence on both human and bio-ecosystem in Indonesian tropical forests. The analysis showed that the complex vegetation structure would lead to higher diversity of forest-dependent species.

Fang Shang

Application of ALOS-2 and Planet images for assessing bird diversity using full polarimetric L-band and C-band sensors

Vegetation, Forestry and Wetland 2

Jan. 25 (Thursday) Conference Room 10A

There are two major approaches for topographic mapping with SAR data: interferometric synthetic aperture radar (InSAR) and SAR stereoscopy (StereoSAR). InSAR exploits the interferometric phase information to extract terrain height accurately, but its applicability is usually limited by the low coherence in rural areas. In contrast, StereoSAR exploits only amplitude information and is thus more suitable for terrain mapping in the forested areas. In order to generate high precision and complete DSM of the forested areas, such as densely vegetated mountainous area, it is necessary to use more robust topographic mapping approaches. In this paper, we present a new method combining the interferometric synthetic aperture radar (InSAR) and SAR stereoscopy (StereoSAR) techniques to generate high-precision DSM of the forested areas.

Zhang Hui

Integrating SLIC Superpixel Segmentation and StereoSAR for Efficient Object Mapping and Assessing Changes of Woody Cover in a Mountainous Area

The corresponding stereo InSAR DSM, stereo SAR DSM and fused DSM are generated with spatial resolution of 10 m. A photogrammetric DSM acquired in 2009 is used as reference DSM with height accuracy better than 1 m and spatial resolution of 1 m to evaluate the accuracy of the generated DSM.

Gu Feng

Vegetation, Forestry and Wetland 2

Jan. 25 (Thursday) Conference Room 10A

In fully polarimetric synthetic aperture radar data interpretation field, incoherent interpretation methods are widely used in many applications. In such conventional methods, the window size is experimentally determined without a clear criterion. In this work, we test parameters such as degree of polarization (DoP) to find the most effective criterion for optimizing the window size.

Shang Xi

Optimization of window size for ALOS-PASSAR2 data interpretation

The impacts of deforestation and logging on bird diversity using ALOS-2 and Planet images. Equally important is the assessment of how fast or slow the recovery of damaged mangroves is. This can enable the formulation of measures for mangrove rehabilitation. The use of ALOS-2 data provided complementary information to explain the changes detected using Planet images.

Blanco Nino

Assessment of Recovery of Mangroves Damaged by Typhoon Haiyan Using ALOS-2 and Planet images

In order to assess the capability of StereoSAR and InSAR to provide high-precision DSM of the forested areas, the impacts of Typhoon Haiyan in Calauit in northern Palawan are examined using ALOS-2 and Planet images. The impacts of deforestation and logging on bird diversity using ALOS-2 and Planet images. Equally important is the assessment of how fast or slow the recovery of damaged mangroves is. This can enable the formulation of measures for mangrove rehabilitation. The use of ALOS-2 data provided complementary information to explain the changes detected using Planet images.

Rosenqvist Ake

The Global Mangrove Watch (GMW) - a status update

ALOS-2 Abstract

Vegetation, Forestry and Wetland 2

Jan. 25 (Thursday) Conference Room 10A

The Global Mangrove Watch (GMW) is an international collaborative project co-founded by the NASA Jet Propulsion Laboratory, the University of South Carolina, and the University of Malaya, and funded by NASA and the Global Environment Facility (GEF). The GMW is a comprehensive, non-intrusive approach that monitors mangrove extent, health, and change from space.

Blanco Nino

Assessment of Recovery of Mangroves Damaged by Typhoon Haiyan Using ALOS-2 and Planet images


**Session 10B**

**Title:** Predicting dengue fever outbreaks in Taiwan using deep learning techniques and remote sensing data

**Speaker:** Jeffrey Lee

**Abstract:**

The number of dengue fever patients has increased in Taiwan in recent years, and countermeasures urgently needed to prevent dengue fever’s spread. In our study, we focus on understanding the spatial and temporal dynamics of dengue fever outbreaks in Taiwan. Our analysis of the outbreaks was based on the available data for selected years, from 2000 to 2019. We investigated the predictive factors of the spread of dengue fever using deep learning techniques and remote sensing data. The model was trained on a large dataset of historical data, including meteorological data, land use/land cover data, and other relevant factors. The results showed that the model could predict the dengue fever outbreaks with high accuracy. This study provides valuable insights into the understanding of dengue fever outbreaks and can be used to develop effective strategies to prevent its spread in the future.

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**Session 10B**

**Title:** Active fire products from MODIS data for the level of forest productivity study on tropical rainforest using multi-sensor SAR and optical observations on vineyard fires

**Speaker:** Xiaojun Fu

**Abstract:**

In this research, we propose an approach for quantitatively monitoring forest fires using multi-sensor optical images and SAR data. We analyzed MODIS data and SAR images of fires in tropical rainforests to study the spatio-temporal variations of forest fires. Our results showed that MODIS data and SAR images can be used to accurately detect forest fires and monitor their development.

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**Session 10B**

**Title:** Development of prediction method for occurrences of large-scale forest fires on the basis of the multi-sensor SAR and optical images of vineyard fires caused by man-made fires in Indonesia

**Speaker:** Kenji Yoshida

**Abstract:**

In this research, we develop a prediction method for the occurrence of large-scale forest fires in Indonesia using multi-sensor SAR and optical images. We analyzed MODIS data and SAR images of fires in tropical rainforests to study the spatio-temporal variations of forest fires. Our results showed that MODIS data and SAR images can be used to accurately detect forest fires and monitor their development.

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**Session 10B**

**Title:** Rice field extraction using PALSAR-2 full polarimetric SAR data observing the Sendai Plain in the full polarimetric mode during the rice planting and maturing season

**Speaker:** Yonezawa Justina

**Abstract:**

In this research, we evaluate the health impacts of smoke haze caused by peatland fires in Indonesia. Specifically, we use air quality monitoring data during haze events for proper exposure assessment and epidemiological studies. We analyze the data to understand the health impacts of haze on the population. Our results showed that haze has a significant impact on the health of the population.

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**Session 10B**

**Title:** Potential of multi-sensor SAR and optical data integration for classification of agricultural fields in Japan: A case study of rice fields in the Sendai Plain

**Speaker:** Della Justina

**Abstract:**

In this research, we analyze the potential of using multi-sensor SAR and optical data for classification of agricultural fields in Japan. We used ALOS-2 PALSAR-2 data observing the Sendai Plain in the full polarimetric mode during the rice growing and maturing season. Our results showed that the combination of SAR and optical data provides complementary information and leads to improved classification accuracy.

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**Session 10B**

**Title:** Development of classification technique of agricultural fields in Japan by use of multi-sensor SAR images

**Speaker:** Norihiro Arai

**Abstract:**

In this research, we develop a classification technique for agricultural fields in Japan using multi-sensor SAR images. We analyzed ALOS-2 PALSAR-2 data observing the Sendai Plain in the full polarimetric mode during the rice growing and maturing season. Our results showed that the combination of SAR and optical data provides complementary information and leads to improved classification accuracy.

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**Speaker:** Della Justina

**Abstract:**

In this research, we analyze the potential of using multi-sensor SAR and optical data for classification of agricultural fields in Japan. We used ALOS-2 PALSAR-2 data observing the Sendai Plain in the full polarimetric mode during the rice growing and maturing season. Our results showed that the combination of SAR and optical data provides complementary information and leads to improved classification accuracy.

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**Session 10B**

**Title:** Development of classification technique of agricultural fields in Japan by use of multi-sensor SAR images

**Speaker:** Yonezawa Justina

**Abstract:**

In this research, we develop a classification technique for agricultural fields in Japan using multi-sensor SAR images. We analyzed ALOS-2 PALSAR-2 data observing the Sendai Plain in the full polarimetric mode during the rice growing and maturing season. Our results showed that the combination of SAR and optical data provides complementary information and leads to improved classification accuracy.
**Hydrology, Snow, Ice and Water Research**

**Dr. Mohammed Dabboor**
**Improving sea ice characterization using ALOS-2 ScanSAR observations**

The objective of this study is to investigate the capabilities of ALOS-2 ScanSAR data to detect and identify different ice types based on microwave scattering characteristics. The study is performed using ALOS-2 ScanSAR observations over the Fram Strait during the winter season. The results show that ALOS-2 ScanSAR data can distinguish between different ice types, such as newly formed sea ice, open water, and thicker ice. The study also demonstrates the potential of ALOS-2 ScanSAR for improved sea ice type characterization and discrimination capabilities aiding operational sea ice services. In this talk, we will present the initial results of our study and discuss the implications for improved sea ice characterization and discrimination using ALOS-2 ScanSAR data.

**Dr. Andrea Manconi**
**Classification of Fram Strait Sea Ice by Imaging and Anthropogenic Processes in Central and Southern California Using ALOS-2 ScanSAR observations**

We will present the results of a study on the classification of Fram Strait sea ice using ALOS-2 ScanSAR observations. We will discuss the capabilities of ALOS-2 ScanSAR data to distinguish between different ice types, such as newly formed sea ice, open water, and thicker ice. The study also demonstrates the potential of ALOS-2 ScanSAR for improved sea ice type characterization and discrimination capabilities aiding operational sea ice services. In this talk, we will present the initial results of our study and discuss the implications for improved sea ice characterization and discrimination using ALOS-2 ScanSAR data.

**Dr. Camilla Brekke**
**Characterizing different sea ice regimes using ALOS-2 ScanSAR observations**

Characterizing different sea ice regimes is typically undertaken using C-band SAR imagery at either HH or VV polarization. There have been suggestions that use of L-band SAR and its longer wavelength and subsequent increased penetration capability could be beneficial for improving sea ice characterization. Here, we present the results of a study that demonstrates the improvement of discriminating between ice types and improving our understanding of ice, especially during the melt season using L-band SAR images.

**Dr. Jun 29 (Rostock)**
**Conferece Room III**

**Dr. Yoshifumi Funahashi**
**Observation of permafrost environment and forest fire in the COASTAL AREA OF JING-JIN-YI using ALOS-PALASAR satellite data**

The permafrost active layer undergoes episodic seasonal thawing processes affecting carbon and hydrological processes. This study evaluated the L-band characterizations of permafrost environments and their seasonal variations. Experimental results with ALOS-PALASAR data indicate that: 1) full-polarimetric SAR observations help understanding seasonal variations of active layer thinning process and signal penetration property caused by the large thickness in the thick permafrost.

**Dr. Touk Ikeno**
**Testing ALOS-2 satellite data to process imaging tests in tectonic and anthropogenic processes in central and southern California using ALOS-2 ScanSAR observations**

Testing ALOS-2 satellite data to process imaging tests in tectonic and anthropogenic processes in central and southern California using ALOS-2 ScanSAR observations. This study aimed to test the capabilities of ALOS-2 ScanSAR data to detect and identify different tectonic and anthropogenic processes, such as ground deformation, surface subsidence, and tectonic movements. The results show that ALOS-2 ScanSAR data can detect and identify these processes with high accuracy, providing valuable insights for further research and applications.

**Dr. Yamanokuchi**
**Changes of ice flows, outlet glaciers in particular, can reflect climate change. By mapping time-series ice-flow velocity, we are also able to investigate the interaction between dynamics of the Antarctic ice sheet and greenhouse gas forcing. We use SAR data to complement the measurements obtained from other sensors, such as radar interferometry.**

In this study, we investigate the interaction between dynamics of the Antarctic ice sheet and greenhouse gas forcing. We use SAR data to complement the measurements obtained from other sensors, such as radar interferometry. The results show that ALOS-2 ScanSAR data can detect and identify different ice flows, including outlet glaciers, with high accuracy, providing valuable insights for further research and applications.

**Dr. Martin B reward**
**On the use of SAR data for ice deformation monitoring and ice thickness retrieval over large area**

Ground deformation measurements from ALOS-2 ScanSAR data are obtained using a differential interferometric synthetic aperture radar (DInSAR) technique. The results show that ALOS-2 ScanSAR data can detect and identify different ice flows, including outlet glaciers, with high accuracy, providing valuable insights for further research and applications.

**Dr. V. Tong**
**ALOS-2-OCF-UCSCAR INTERMEDIATE FOR GROUND DEFLECTION MONITORING IN COASTAL AREA OF ENGLISH T. NORTHERN CHINA**

Differential interferometric synthetic aperture radar (DInSAR) has developed fast over the past decade and gradually becomes a fast and effective technique in in-situ observational surface deformation with a continuous and high-resolution accuracy since it was successfully applied to study the deflection measurement caused by large-scale perturbations. This technique is based on interferometric analysis of synthetic aperture radar (SAR) images over different observation periods. The technique is used to measure ground deformation and to detect changes in topography and surface subsidence. It has been widely used for monitoring ground deformation caused by natural processes, such as earthquakes, landslides, and volcanic activities, as well as human-induced processes, such as ground settlement, mine subsidence, and landfill settlement. The results show that ALOS-2-OCF-UCSCAR can detect and identify different ice flows, including outlet glaciers, with high accuracy, providing valuable insights for further research and applications.
During Typhoon Morakot in 2009, the deep-seated landslide in Hsiaolin Village transformed into a catastrophic landslide and killed over 450 people. How to find deep-seated landslides on the main island of Taiwan and assess their activity have since then become a significant task for the government for disaster prevention and mitigation. In the past few years, our research team has, according to topographic signatures of landslides, identified over 10,000 deep-seated landslides using airborne LiDAR data and 1-m resolution DEM. Among these landslides, we must know which landslides have the potential to become a catastrophic landslide in order to make a reasonable landslide mitigation plan. Temporally coherent points (TCPs) are points that remain coherent in one or several interferograms of SAR acquisitions (Zhang et al. 2012). The TCP-InSAR analysis is based on ALOS/PALSAR images acquired from Dec. 2006 to Mar. 2011 with a satellite recurrence cycle of 46 days. The annual deformation rate is calculated from more than 20 satellite images. In this study, we applied to construct the annual deformation in 135 deep-seated landslide sites. Our analysis is an alternative solution for constructing a deep-seated landslide inventory. We evaluated and detected their activity, separate stable and unstable areas, and define the locations of deep-seated landslides. By comparing the TCPs and the field investigation records, several imperceptible deep-seated landslides have been confirmed. The surface deformation pattern also implies different landslide developments and failure mechanisms on the slopes. Furthermore, such monitoring can also be used to detect suspicious activity and fast deformation that correspond to presence of catastrophic landslides. TCP-InSAR provides the possibility to monitor deep-seated landslide activity on an extensive area. From the short-term perspective, we can conduct a comprehensive investigation on potential landslides with a high potential to become catastrophic landslides. By comparing the TCPs and the field investigation records, several imperceptible deep-seated landslide locations with identifiable boundaries and spatial distribution of instability are found. The surface deformation pattern also implies different landslide developments and failure mechanisms on the slopes. Furthermore, such monitoring can also be used to detect suspicious activity and fast deformation that correspond to presence of catastrophic landslides. TCP-InSAR provides the possibility to monitor deep-seated landslide activity on an extensive area. From the short-term perspective, we can conduct a comprehensive investigation on potential landslides with a high potential to become catastrophic landslides.