

Mission of creating base maps as public infrastructures for disaster and monitoring

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As a satellite earth observation mission to be realized as Japan, we propose a mission of creating base maps as public infrastructures for disaster and monitoring.

The purpose of the proposed mission, is the observation and the base map prepared, as well as the monitoring and elucidation of global resources from long-term and continuous quantitative monitoring of large-scale disasters. Optical and SAR sensors, which are the genealogy of ALOS, observe with high spatial resolution, so that it can be applied to basic information (land cover, topography), disaster prevention / reduction (change detection, flooding, illegal dumping) Actual utilization such as agriculture (precision farming, food security), forestry, fishery, energy (geology, reserves, resource management, pollution monitoring), climate change (glacier, drift ice, flood), environment (coastal environment, carbon stock), To earth science, and so on.

High resolution earth observation data with a wide swath is necessary for detailed map creation which is limited in medium resolution satellite. The high-resolution base map created from the satellite data covering the whole earth will be developed as public infrastructures and become a data access hub and can contribute to social implementation of satellite images such as disaster and agriculture. Then, it will serve as a basis for use in policies to solve international and regional issues, and for use in providing services enriching our lives. In particular, agriculture, forestry and fisheries industry and land management, disaster prevention, social infrastructure is a leading application area. For example, it is difficult to predict when and where a disaster occurs, so it is necessary to maintain wide-area high-resolution images as a base map. In SIP the second phase by the Japanese Cabinet Office, "strengthening national resilience (disaster prevention and reduction)" is started, high-resolution satellite as public infrastructure, supposed to be the supply of data and information There. Also, for use in the map creation field, there are cases where ALOS data was used for updating maps at the Geographical Survey Institute, etc. and for field polygon production work at Ministry of Agriculture and Fisheries. Underlying data of these G space is necessary essential to the realization of data society called "Society 5.0" promoted by the government. In SAR, it is required to make observation of the ground change due to forest monitoring and interferometric SAR, making full use of the achievement of Japan's L band. In addition, there is great expectation for high resolution monitoring of polar sea ice and glacier utilizing observational weatherability. It is desirable for both sensors to operate at the same time, since various effects such as complementation and improvement in accuracy can be obtained by using the optical sensor and the SAR sensor in an integrated fashion.

Thus, for optical, it is necessary capability to observe a wide range of several tens of km high resolution image having m ~ sub meter. In addition, it is regrettable that ALOS-3 could not install the all-time stereoscopic observation that was an advantage over other countries in ALOS, and it is desirable to have a resurrection by successor satellite. With regard to SAR, it is considered to adopt a new method by DBF in ALOS - 4, and it is considered that wide range high resolution observation such as several hundred kilometers at several m resolution by DBF technology can be continued for succeeding machines depending on the result.

However, since the data becomes extremely large in both optical and SAR, the part of downlinking this data becomes a bottleneck. It is important to continue to cooperate with the development of other data downlink environments including data transmission speed, data on board processing, data relay satellite, ground station and communication, basic research on data compression technology.

In addition, the observed frequency secure has become a real operational issues, this is a need for a solution to break, the number of satellites increases or the constellation, a wide swath, the study of technologies, such as the attitude maneuver. In addition, as an innovative solution, it is necessary to consider the high resolution observation from the geostationary orbiting satellite, etc.

Environmental changes caused by global warming, earth resources from the viewpoint of long-term monitoring of (mineral resources, biological resources, water resources, etc.), and continues without interrupted the ALOS Series with high resolution sensor is desired. We believe it will lead to a worldwide presence improvement of the ALOS series.

Keywords: High resolution, wide swath, ALOS series