Enhancing Satellite Data Reception Capabilities in FMI Arctic Research Centre at Sodankylä

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Finnish Meteorological Institutes's Arctic Research Centre (FMI-ARC) own and operates satellite receiving station in its Sodankylä facilities. With the current 2.4 meter antenna FMI receives the direct data downlink from NASA's EOS Aura and EOS Terra, and EOS Aqua spacecrafts. EOS Aura spacecraft has OMI instrument on board measuring atmospheric ozone column. The OMI data is downlinked to Sodankylä simultaneously as it is measured for Very-Fast-Delivery (VFD) data products of ozone content above Finland and northern Europe. Direct downlink of MODIS data from EOS Terra and EOS Aqua is also received and data is distributed to scientific users in Finland.

With the current antenna, it is possible to receive the downlink from two spacecrafts without conflict. With some re-scheduling, the capability can be increased to accommodate third spacecraft. However, the data rate of the current system is limited and the satellite data dumb, cannot be received. In order to enhance its reception capability, FMI has initiated a development project to procure, install and test a new ~7-meter satellite reception antenna and relevant receiver hardware to enable the reception and data processing of the data dump from various satellites.

The new satellite receiving station and data processing facilities will facilitate the development of independent environment observation system that enables Finland to prepare for natural disasters as well as weather and climate induced emergencies more efficiently. Potential applications and uses of the system are for example: flood detection, ice monitoring in the Baltic Sea, forest fire detection, oil-spill monitoring, and snow cover analysis and various other remote sensing applications.

With current antenna and facilities, FMI has already extensive co-operation with NASA, ESA, EUMETSAT and KNMI. With the new antenna and the infrastructure, it will be possible to receive and to process data from several new space missions. Concrete co-operation plans already exists with current partners, as well as new partners like China and Canada. The new antenna also opens the possibility for FMI to provide satellite data reception and data processing services to various parties both domestically and internationally.