

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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DIEGO – DYNAMIC INFRARED EARTH OBSERVATION ON THE ISS ORBIT

Abstract

The ISS is the greatest international scientific project mankind has ever carried out and, simultaneously, the largest artificial object on the Earth's orbit. Germany participates in research aboard the ISS with a variety of experiments, ranging from research on the atmosphere to space medicine and ornithology. Up until now, the ISS orbit seemed less suitable for scientific instruments performing Earth observation tasks. Unlike satellites on polar orbit, the ISS is on an inclined equatorial orbit, sun-asynchronous, and with variable nadir. At second glance, the dynamic orbit of the ISS combines some unique features: First of all, it allows earth observation at different day and night-times. Secondly, it is approx. 400 km closer to the Earth's surface than most satellite orbits. Thirdly, the ISS is manned, meaning that external experiments facing unexpected problems can be repaired by the astronauts themselves. The talk will present the framework of one of the first German experiments focusing on Earth observation on the ISS: "DIEGO – Dynamic Infrared Earth Observation on the ISS Orbit" will use the unique advantages of the ISS orbit. The sensor will collect high-resolution, multi-spectral data in visible, near infrared (VNIR), and mid infrared (MIR), as well as thermal infrared (TIR) of the Earth's surface. The resolution within the TIR spectra will exceed 60 m. This is necessary to deduce essential climate variables like fire disturbance via the fire radiative power, but also measurements for cloud, land, and sea surface temperatures. The DIEGO mission data will be made available to the scientific and research community via web GIS and data hubs. Furthermore, one of the main goals of DIEGO is to spread and deepen knowledge about key technologies of space flight and earth observation in school lessons and break new ground in digital education and experimental learning for knowledge transfer.