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Swarm: ESA's Magnetic Field Mission – User Interfaces and Scientific Validation

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Swarm is the fifth Earth Explorer mission approved in ESA's Living Planet Programme, and successfully launched on 22 of November 2013. The objective of the Swarm mission is to provide the best-ever survey of the geomagnetic field and its temporal evolution using a constellation of 3 identical satellites. The Mission shall deliver data that allow access to new insights into the Earth system by improved scientific understanding of the Earth's interior and near-Earth electromagnetic environment. After launch and triple satellite release at an initial altitude of about 490 km, a pair of the satellites will fly side-by-side with slowly decaying altitude, while the third satellite will be lifted to 530 km to complete the Swarm constellation. High-precision and high-resolution measurements of the strength, direction and variation of the magnetic field, complemented by precise navigation, accelerometer and electric field measurements, will provide the observations required to separate and model various sources of the geomagnetic field and near-Earth current systems. The mission science goals are to provide a unique view into Earth's core dynamics, mantle conductivity, crustal magnetisation, ionospheric and magnetospheric current systems and upper atmosphere dynamics - ranging from understanding the geodynamo to contributing to space weather. The scientific objectives and results from recent scientific studies will be presented. In addition the current status of the commissioning of the satellites and the ground segment will be addressed. A consortium of European scientific institutes is developing a distributed processing system to produce geophysical (Level 2) data products for the Swarm user community. The setup of the Swarm interfaces to the scientific user community as well as the effort in the scientific validation of the data products during the early phase of the mission will be addressed in this presentation.