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SCARF - The Swarm Satellite Constellation Application and Research Facility

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Swarm, a three-satellite constellation to study the dynamics of the Earth's magnetic field and its interactions with the Earth system, has been launched in November 2013. The objective of the *Swarm* mission is to provide the best ever survey of the geomagnetic field and its temporal evolution, which will bring new insights into the Earth system by improving our understanding of the Earth's interior and environment.

In order to take advantage of the unique constellation aspect of *Swarm*, considerably advanced data analysis tools have been developed. Scientific users will also benefit significantly from derived products, the so-called Level-2 products, that take into account the features of the constellation. The *Swarm* SCARF (Satellite Constellation Application and Research Facility), a consortium of several research institutions, has been established with the goal of deriving Level-2 products by combination of data from the three satellites, and of the various instruments. A number of Level-2 data products will be offered by this consortium, including various models of the core and lithospheric field, as well as of the ionospheric and magnetospheric field. In addition, derived parameters like mantle conductivity, thermospheric mass density and winds, field-aligned currents, an ionospheric plasma bubble index, the ionospheric total electron content and the dayside equatorial zonal electrical field will be calculated. This service is expected to be operational for a period of at least 5 years.

The present paper describes the *Swarm* input data products (Level-1b and auxiliary data) used by SCARF, the various processing chains of SCARF, and the Level-2 output data products determined by SCARF.