

# On the operational space weather service for GNSS precise positioning

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SWIPPA (Space Weather Impact on Precise Positioning Applications) is a project initiated by the German Aerospace Centre (DLR) and co-sponsored by the European Space Agency (ESA). The project aims at establishing, operating, and evaluating a specific space-weather monitoring service that can possibly lead to improving current positioning applications based on Global Navigation Satellite Systems (GNSS). Reported here is the current status of SWIPPA and particularly detailed is the operational phase.

The established SWIPPA service centre at DLR operates a powerful data processing system working, in both real-time and post-processing modes, to provide the project consortium members with essential expert information delivered in the form of several products.

Foremost, generated are real-time products based on data from the reference network *ascos*<sup>®</sup>, a reliable network which is typically operated at a sampling rate of 1 measurement per second (1Hz sampling rate). Primary measurements are formatted and transferred to the DLR processing facility where new value-added products based on these measurements are produced and distributed immediately, for example - maps of TEC values, TEC spatial and temporal gradients.

Simultaneously, collected are several important ground and space based observations of the ongoing space weather conditions, including: solar wind parameters, geomagnetic field's horizontal component, percentage deviation of currently measured critical frequencies from monthly medians, and others. By regularly analysing and synthesising the incoming geophysical information, short messages are prepared, summarising the current conditions and warning for ongoing/upcoming ionosphere disturbances.

The next project phase includes a thorough evaluation of the operational service, particularly in regard to the optimal spatial and temporal resolution of the mapping, the dissemination of all products, and finally, the overall reliability and applicability of the service.