Space Weather Activities in Hungary

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Hungarian space weather related researches

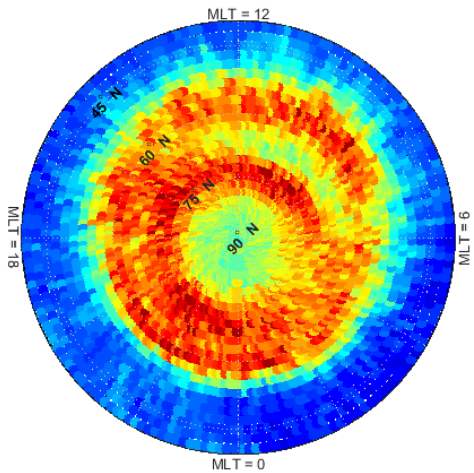
* Eötvös Loránd University, Budapest
* Institute for Earth Physics and Space Science, Sopron
* Wigner Research Centre for Physics, Space Physics and Space Technology research groups, Budapest
* Centre for Energy Research, Space Research Department, Budapest

EPHEMERIS – New space weather information exploited from the swarm observations

ESA's EPHEMERIS project (2019-2021)

(New Space Weather Information Exploited from Swarm Observations)

Call Ref.No.: **AO/1-8859/16/NL/CBi ,** PI: Balázs Heilig (heilig.balazs@epss.hu)



Magnetic field irregularities, shown by average IMIs (2014 and 2015) in the northern polar region, in high geomagnetic activity (Kp>3). The auroral oval and the plasmapause (near noon) are outlined.

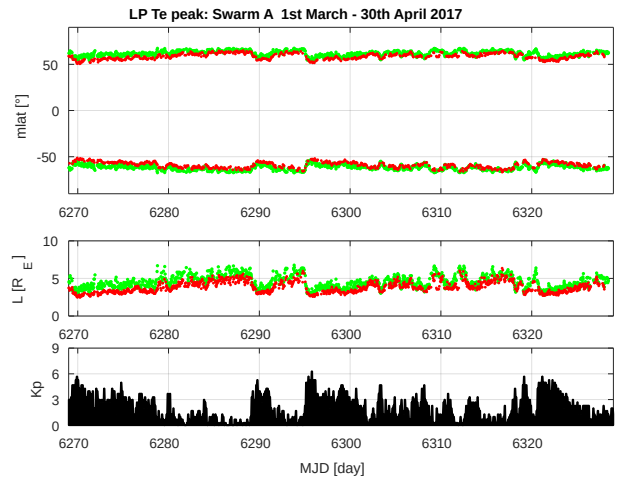
Project's Objectives:

Development of a methodology for the autonomous detection

- of the midlatitude ionospheric trough (MIT) phenomenon
- of the occurrences of intermittent plasma fluctuations via the newly developed intermittency index (IMI)

along the orbits of the Swarm space-crafts.

Both products react to the space weather activity.



(*top*) **MIT** compared to **SSFAC boundary** in both hemispheres, (*middle*) mapped into the magnetosphere, and (*bottom*) **Kp index**

Vellante, M., et al. (incl. B. Heilig) (2021). Multi-instrument characterization of magnetospheric cold plasma dynamics in the June 22, 2015 geomagnetic storm. Journal of Geophysical Research: Space Physics, 126, e2021JA029292. https://doi.org/10.1029/2021JA029292

Heilig et al. (2022) "Relation of the Plasmapause to the Mid-latitude Ionospheric Trough, the Sub-Auroral Temperature Enhancement and the distribution of Small-Scale Field Aligned Currents as Observed in the Magnetosphere by THEMIS, RBSP and Arase, and in the Topside Ionosphere by Swarm" [Paper #2021JA029646RR], Journal of Geophysical Research - Space Physics. (accepted)

SSA P3-SWE-LII PLASMASPHERIC PRODUCTS FOR SPACE WEATHER SERVICES

ESA project (2020-2023), PI: JÁNOS LICHTENBERGER (lityi@sas.elte.hu)

Carry out an analysis of the SSA SWE service requirements

Providing real-time specification of plasmaspheric characteristics and the resulting service improvements

Test and validate plasmaspheric specification and forecast products as part of the SSA SWE Service Network

Assessment of the products / service carried out with end user involvement

Test campaign

Space Weather Database

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