Geophysical Research Abstracts
Vol. 19, EGU2017-6350, 2017
EGU General Assembly 2017

Evaluation of beam tracking strategies for the THOR-CSW solar wind instrument

Johan De Keyser (1), Benoit Lavraud (2), Lubomir Prech (3), Eddy Neefs (1), Sophie Berkenbosch (1), Bram Beeckman (1), Romain Maggiolo (1), Andrei Fedorov (2), Rituparna Baruah (2), King-Wah Wong (2), Carine Amoros (2), Romain Mathon (2), and Vincent Génot (2)

(1) Royal Belgian Institute for Space Aeronomy, Brussels, Belgium, (2) Institut pour la Recherche en Astronomie et l'Espace, Toulouse, France, (3) Charles University, Prague, Czech Republic

We compare different beam tracking strategies for the Cold Solar Wind (CSW) plasma spectrometer on the ESA M4 THOR mission candidate. The goal is to intelligently select the energy and angular windows the instrument is sampling and to adapt these windows as the solar wind properties evolve, with the aim to maximize the velocity distribution acquisition rate while maintaining excellent energy and angular resolution. Using synthetic data constructed using high-cadence measurements by the Faraday cup instrument on the Spektr-R mission (30 ms resolution), we test the performance of energy beam tracking with or without angular beam tracking. The algorithm can be fed both by data acquired by the plasma spectrometer during the previous measurement cycle, or by data from another instrument, in casu the Faraday Cup (FAR) instrument foreseen on THOR. We verify how these beam tracking algorithms behave for different sizes of the energy and angular windows, and for different data integration times, in order to assess the limitations of the algorithm and to avoid situations in which the algorithm loses track of the beam.