Modeling and Data Analysis Tools in preparation for solar wind studies with Solar Orbiter

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I will present ongoing efforts carried out within the ESA Modeling and Data Analysis Working Group (MADAWG) to develop tools and methods that automatically estimate the magnetic connectivity between the solar surface and any point in interplanetary space, the paths and propagation delays of plasma and energetic particles, and that establish connections between remote observations of the solar surface and corona, and in-situ measurements of the solar wind. These are key points for the exploitation of the Solar Orbiter and Parker Solar Probe missions and to establish synergies between them.

Different numerical models and data products are brought together in order to provide robust predictions of the physical properties of the time-evolving surface and coronal magnetic field, and of the structure of the solar wind. Such new tools and models are expected to operate equally well on past data and on short-term forecasts, and should provide quantitative means to test theories on the structure and heating processes of the solar corona and wind back to the community.