

RADIO EMISSION PROCESSES AS TRACERS OF HELIOSPHERIC WEATHER

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The Heliosphere is a complex physical system composed of a set of coupled plasma sub-systems typically in a state of marginal stability. Hence a variety of perturbations can be triggered by instabilities occurring at large to small spatial and temporal scales. This characterizes the heliospheric weather, i.e. the physical state of the Heliosphere on a short- to mid-timescale, which is a key aspect for the study of Space Weather and Space Climate. Interacting plasmas in the Heliosphere originate a variety of radio emissions according to processes that, in turn, are signatures of kinetic and magnetohydrodynamic plasma processes occurring at different scales. Space- and ground-based observations of such radio emissions represent a fundamental tool for deriving the associated emission processes and, therefore, the underpinning plasma processes, that in turn are tracers of the plasma state, i.e. of the heliospheric weather. In this work we illustrate the present observational and interpretative scenario about the heliospheric radio emission processes and we highlight the expected improvements by the forthcoming next generation instruments.

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