
Connecting Electrons at the Sun and in the Heliosphere through X-ray and Radio Diagnostics

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Résumé

One of the main objective of the Solar Orbiter mission concerns the production of energetic particles in the heliosphere, and the link between energetic particles at the Sun and in the Heliosphere. For energetic electrons, part of this question can be addressed by combining X-ray and radio observations. The launch of the Solar Orbiter in early 2020 marked a significant milestone, as it is equipped with the capability to simultaneously capture both types of emission. In this contribution, we shall present the results of a first statistical study (Paipa-Leon et al. 2026) based on several tens of events with associated X-ray and interplanetary type III emissions. We will investigate the correlations between the properties of interplanetary type III radio bursts and of their associated HXR : energy density of the X-ray emitting electrons and characteristics of the radio burst (peak flux, exciter velocity and energy contained in the radio emitting electrons). We will then present preliminary results obtained from the combination of the RPW interplanetary type III catalog recently published (Pesini et al. 2026) and the list of X-ray flares observed by STIX (Hayes et al. 2025) and will investigate how the association rates varies with the distance of the spacecraft to the Sun, the GOES class, the connection with particular active regions, the longitude of the flaring active region.

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