

O2.J802 Determination of plasma physical properties across collisionless shocks driven by solar eruptions

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See the full abstract here <http://ocs.ciemat.es/EPS2019ABS/pdf/O2.J802.pdf>

Over the last decades the availability of continuous observations of the solar atmosphere (the corona) from space allowed to study in great details solar eruptions, namely Coronal Mass Ejections (CMEs; see review by Webb & Howard 2012). For major CMEs it was shown (Vourlidas et al. 2003; Ontiveros & Vourlidas 2009) that coronagraphic observations acquired in Visible Light (VL) band contain faint arch-shaped intensity increases surrounding the eruption front (Figure 1), that have been identified as compression fronts due to CME-driven interplanetary shock waves. This talk will review recent results on the physics of CME-driven shocks as obtained with the analysis of VL and UV coronagraphic images, EUV full disk images, combined with radio dynamic spectra and MHD numerical simulations.

Combination of these data allowed us to infer unique information on the plasma across the shock surface, such as the density compression ratio (Bemporad & Mancuso 2010), but also the Alfvénic Mach numbers and the magnetic field compressions all along the shock fronts (Bemporad et al. 2016; Susino, Bemporad & Mancuso 2015; Frassati et al. 2019); the reliability of these results has been also tested with numerical MHD simulations (Bacchini et al. 2015).

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