

Interplanetary type II radio bursts and coronal mass ejections

V. Krupar^{*(1)}, O. Santolik^(1,2), M. Maksimovic⁽³⁾, J. Soucek⁽¹⁾, and O. Kruparova⁽¹⁾

(1) Institute of Atmospheric Physics ASCR, Prague 14131, Czech Republic

(2) Faculty of Mathematics and Physics, Charles University, Prague 121 16, Czech Republic

(3) LESIA, UMR CNRS 8109, Observatoire de Paris, Meudon 92195, France

Coronal Mass Ejections (CMEs) are related to the formation of large-scale magnetized plasma disturbances traveling through the corona and the solar wind which can have a significant impact on Earth. Along their path CMEs drive fast mode shocks, which in turn accelerate ions and electrons. The accelerated electrons can generate type II radio bursts and serve as an indicator of shocks near the Sun. Interplanetary type II radio bursts are only observable by space-based instruments due to the ionospheric cutoff. We use data from the two STEREO spacecraft which carry imaging and radio instruments with direction-finding capabilities allowing us to track energetic electrons responsible for radio bursts. We present an analysis of an the interplanetary type II radio burst from the November 29 – 30, 2013 (panel a: STEREO-A, panel b: STEREO-B). This burst was probably driven by a CME lifted at 20:24 UT with a speed of 420 km s^{-1} according to the SEEDS database (spaceweather.gmu.edu/seeds). We have investigated three time – frequency intervals when a signal was intense enough for direction-finding analysis. We assumed that radio emissions propagate along a straight line from the source to the spacecraft. Positions of triangulated radio sources suggest that CME propagates towards the STEREO-A (not shown here). We have plotted obtained radio sources over the coronagraph images STEREO-A (STEREO-A/SECCHI/Cor2) for the first two intervals (panel c: 22:24 UT, panel d: 00:54). Radio sources for the third interval are out-of-sight of all coronagraphs. Our results suggest that this type II burst was triggered by interactions between the CME and two streamers located on the southern limb of the Sun.

