

Radio triangulation - mapping the 3D position of the solar radio emission

Jasmina Magdalenic

Royal Observatory of Belgium, Brussels, Belgium (jasmina.magdalenic@sidc.be)

Understanding the relative position of the sources of the radio emission and the associated solar eruptive phenomena (CME and the associated shock wave) has always been a challenge. While ground-based radio interferometer observations provide us with the 2D position information for the radio emission originating from the low corona (up to 2.5 R_{\odot}), this is not the case for the radio emission originating at larger heights.

The radio triangulation measurements (also referred to as direction-finding or goniopolarimetric measurements) from two or more widely separated spacecraft can provide information on the 3D positions of the sources of the radio emission. This type of interplanetary radio observations are currently performed by STEREO WAVES and WIND WAVES instruments, providing a unique possibility for up to three simultaneous radio triangulations (using up to three different pairs of spacecraft).

The recent results of the radio triangulation studies bring new insight into the causal relationship of the solar radio emission and CMEs. In this presentation I will discuss some of the most intriguing results on the source positions of: a) type III radio bursts indicating propagation of the fast electrons accelerated along the open field lines, b) type II radio bursts indicating interaction of the CME-driven shocks and other coronal structures e.g. streamers and c) type IV-like radio bursts possibly associated with CME-CME interaction.