

Evidence of a distant decimetric spike source connected to the main electron acceleration site: First high time cadence GMRT observations

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Bisoi, Susanta Kumar; Sawant, Hanumant; Janardhan, Padmanabhan; Awasthi, Arun Kumar; Yan, Yihua; Srivastava, Shweta; Chen, Linjie

We present a study of decimetric radio activity, associated with two (GOES C1.4 and M1.0 class) flares and a coronal mass ejection (CME) of 20 June 2015, using the first high time cadence (0.5 s) 610 MHz observations of the Giant Meterwave Radio Telescope (GMRT). The GMRT images show strong radio sources during the M1.0 flare and CME, which are located near the flaring site, while, in contrary, a strong spike radio source during the C1.4 flare, with no corresponding coronal or magnetic features, are rather located about 500 arcsec away from the flare site in soft X-rays. Although weak radio burst sources are located near the flaring site, during the C1.4 flare maximum, associated with the spike radio source, which show a good temporal correspondence with a metric type-III burst identified by the Solar Broadband Radio Spectrometer at Yunnan Astronomical Observatory. A multi-wavelength analysis, in combination with potential field source surface extrapolation, has been carried out to investigate the genesis of non-thermal radio emitting electrons, which revealed that the distant spike radio source, noticed during the C1.4 flare, is actually connected to the main electron acceleration sites and is generated by a plasma emission instead of a loss cone maser instability.

Publication:

42nd COSPAR Scientific Assembly. Held 14-22 July 2018, in Pasadena, California, USA, Abstract id. E2.2-11-18.

Pub Date:

July 2018

Bibcode:

2018cosp...42E.360B