A systematic study of HXR flares and Metric type III radio bursts between 2002 and 2015

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We conducted an extensive survey spanning 2002-2014 to select events with temporally and spatially correlated HXR and type III radio emission. For HXR data, we used RHESSI and FERMI. RHESSI data is available from 2002 till 2014, while FERMI data is available from 2008. FERMI data increases the chance to observe more HXR events that may have occurred during RHESSI night or SAA. We use a combination of instruments to track the radio emission of the type III. For frequencies above 100 MHz, we use the PHOENIX spectrometer which is part of the e-CALLISTO network for events that occurred between 2002-2011 and the ORFEE spectrograph for events between 2012-2014. For frequencies between 10 and 100 MHz, we used the Nançay Decametric Array (NDA). For frequencies below 10 MHz, we used WIND/WAVES. Following criteria were required to be satisfied for an event to be included in the shortlist.

- For the flare, we require good HXR counts above background at least till 25 keV. A well-defined and detectable rise and decay profile was also required. Events which were partially occulted while the instrument was in Earth’s shadow were not included.
- A type III burst which had a clear presence in greater than 100 MHz frequency range. We also required that the event extend into the NDA. Presence of the burst in the WIND/WAVES instrument which indicated the interplanetary extension of the burst was not a pre-requisite. We further required that the type III fell within the rise or decay profile of the HXR flare.
- Clear increase of flux in the NRH 150 MHz frequency channel at the time of type III burst. Presence of the burst in the NRH for flux measurements.

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