

M27a Study on a birth environment of metric type II bursts

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In the previous ASJ meeting, we report radio pulsations with a GOES M6.7 class flare that occurred on 2004, July 13 near 00 UT. We discussed the origin of quasi-periodic pulsations (QPPs) that were observed by the Nobeyama radio polarimeters (NoRP) at 1–35 GHz and by the RHESSI HXR detectors at 25–100 keV. During this event, several transient phenomena were observed: a filament eruption, loop expansion in EUV and H alpha, and a radio type II burst by HiRAS spectrometer at Hiraiso, NiCT. Note that the radio type II burst indicates a propagating shock wave. At larger heights, later on, an EIT-wave, a second type II burst, and a coronal mass ejection (CME) were observed. In this meeting, we will discuss a possible connection of the pulsating structures at the flare site with the outward propagating ejecta and shock waves.

In conclusion, the fast-speed EUV ejecta that soon overtook a slower erupting EUV loop is a possible driver for the first, fast-drift type II burst. The EIT wave and the CME itself could be driving the second, slow-drift type II burst. Based upon a composite dynamic spectrum from HiRAS (25–2500MHz) and NoRP (interpolated over 1–100 GHz), we found a faint type IV-like structure that appeared around 20 GHz at the flare onset, and then gradually drifted toward lower frequencies. As the two type II lanes were lying along the lower cut-off frequency envelope of the drifting type IV, we suppose that (1) the envelope may correspond to an expansion front of the ejecta or a blast wave that initiated at the flare onset, and (2) the two Type II bursts were driven right above the expansion front.