

M28a Radio and hard X-ray Quasi-periodic pulsations during the 2004 July 13 flare

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Since the Transition Region and Coronal Explorer (TRACE) found flare-associated coronal loop oscillations in EUV/coronal lines, study of periodic phenomena on/above the solar surface has been significantly advanced. The quasi-periodic pulsations (QPPs) in radio and hard X-rays (HXR) during flares belong to one of the categories. Nobeyama radioheliograph (NoRH) can provide microwave images with a time resolution up to 0.1 sec, which is suitable for study of spatially resolved QPPs (Asai et al. 2001).

We examine QPPs in radio (9.4–35 GHz; NoRH) and HXR (25–100 keV; RHESSI) emissions, which were well correlated for 200 sec with a period of about 20 sec. The event occurred at AR10646 (N14W45) on 2004 July 13 during an M6.7 flare that produced an EIT wave, metric type-II bursts, and a partial halo CME. The HXR images show an asymmetric double source with a distance of about 20", which presumably correspond to conjugate footpoints of a flaring magnetic loop. TRACE EUV images show a dark filament lying above the double source, which began to erupt after the start of the QPPs. NoRH 17 GHz images show a single source centered between the HXR double source. Magnetograms from the SOHO/MDI suggest that this flare was triggered by a magnetic flux that emerged around the HXR sources. Considering the evolution of surrounding magnetic structures, we try to address the relationship between the QPP profiles and the eruptive features.