



Fine structures of type II radio burst observed by LOFAR

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The M2.0 class flare (peaked at 15:10 UT) on August 25, 2014 originated from the NOAA AR 2146 at that moment situated rather close to the west solar limb. The flare was associated with coronal dimming, EUV wave, halo CME and the type II radio burst observed in the meter to decameter wavelengths. The metric type II burst was observed by the LOFAR (LOW Frequency ARray) radio interferometer.

The type II burst shows strong fragmentation of the radio emission, and although fine structures of type II bursts were already reported, the wealth of the fine structures observed in the August 25, 2014 event is unprecedented. The fine structures within the type II burst are morphologically very similar to the fine structures usually seen superposed on the type IV continuum emission. Together with the herringbone structures, inverted J-bursts and U-bursts, we observe also narrowband bursts similar to simple narrowband SSSs (Magdalenic et al., 2006), i.e. spike-like, dot-like, sail-like and flag-like bursts, and number of different unclassified bursts.

The main characteristics of the fine structures observed within type II burst are compared with the characteristics of type IV fine structures in the same wavelength range. We believe that LOFAR observations bring the new insight into the physics of the shock waves and its radio signatures, and therefore also new challenges for the theory of the shock acceleration.