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Different properties of microwave and metric QPPs in a solar radio burst

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We analyse quasi-periodic pulsations (QPPs) which happened about 25 minutes after an M4-class solar flare on 5 September 2017. The QPP event was manifested as a bursty rapid enhancement of the flare microwave and decimeter radio emission, with almost no signatures pronounced in soft X-rays in comparison with the background flux caused by the decay phase of the preceding M4 flare. Simultaneous observations of this event with the two radioheliographs of a new generation —the Siberian Radioheliograph (4–8 GHz) and the MUSER radioheliograph (0.4–2 GHz) —reveal the presence of QPPs which were co-existing in the microwave and decimeter bands. Quasi-periodic narrow-band bursts at 0.4–0.8 GHz with a characteristic timescale of about 5 s and a fine structure inside each burst are seen in the coherent emission. In the 4–8 GHz band, we detect QPPs of the non-coherent emission, with a longer period that decreases gradually from 35 s to 25 s during the event. The work aims to identify the presence or absence of a connection between these two types of QPPs by analysing their temporal features in the two types of emission, as well as analysing the available spectral and spatial information. Based on this analysis, the most likely scenarios for the event are discussed.

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