EGU21-14817, updated on 26 May 2022
https://doi.org/10.5194/egusphere-egu21-14817
EGU General Assembly 2021

Waves and Quasi-Periodic-Pulsations in Weak Active Solar Emissions

Divya Oberoi[1], Atul Mohan[2], and Surajit Mondal[1]
[1]Tata Institute of Fundamental Research, National Centre for Radio Astrophysics, Pune, India (div@ncra.tifr.res.in)
[2]Rosseland Centre for Solar Physics, Institute of Theoretical Astrophysics, University of Oslo, Oslo Norway

The presence of Quasi-periodic pulsations (QPPs) is found to be a common feature of flaring energy release processes on the Sun. They are observed all across the EM range from hard X-rays to radio and provide insights into the physical conditions in the coronal plasma and the processes involved in the generation of these waves and oscillations. There have been numerous observations of spatially resolved QPPs at higher energies, though there are fewer examples at radio frequencies. Spatially resolved observations of these phenomena are particularly rare at low radio frequencies and there are none which are associated with the weaker episodes of active emissions which are much more numerous and frequent. The key reason limiting such studies has been the lack of availability of spectroscopic snapshot images of sufficient quality to detect and characterise the low level changes in the morphology of the sources of active emissions. Together, the data from the Murchison Widefield Array (MWA), a SKA precursor, and an imaging pipeline developed to meet the specific needs of solar imaging, now meet this challenge and enable us to explore this rich and interesting science area. Our work has led to the discovery of several previously unknown phenomena - second-scale QPPs in the size and orientation of a type III source, with simultaneous QPPs in intensity; 30 s QPPs in the radio light curve of a type I emission source associated with active region loop hosting a transient brightening; and intermittent presence of an anti-correlation in the size and intensity of a type I noise storm source along with QPPs. In this presentation we will briefly summarise these recent results and discuss their implications.