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MUSER observation and event analysis

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MUSER (MingantU SpEctral Radioheliograph) in China is composed of three arrays with MUSER-L covers 30-400 MHz with 224 LPDAs, MUSER-I covers 0.4-2.0 GHz with 40 mesh antennae and MUSER-H covers 2–15 GHz with 60 dish antennae. They had recorded a huge amount of data (>5PB). And hundreds of bursts were found. This presentation will report the events checked, the data processing, and the spectrum and spatial result for some interesting events.

MUSER-L have observed all kind of metric type-I, type-II, type-III, type-IV and type-V bursts since 2023 September. Type J, type II with many stripes, and some rare structure events (Figure 1) will be reported.

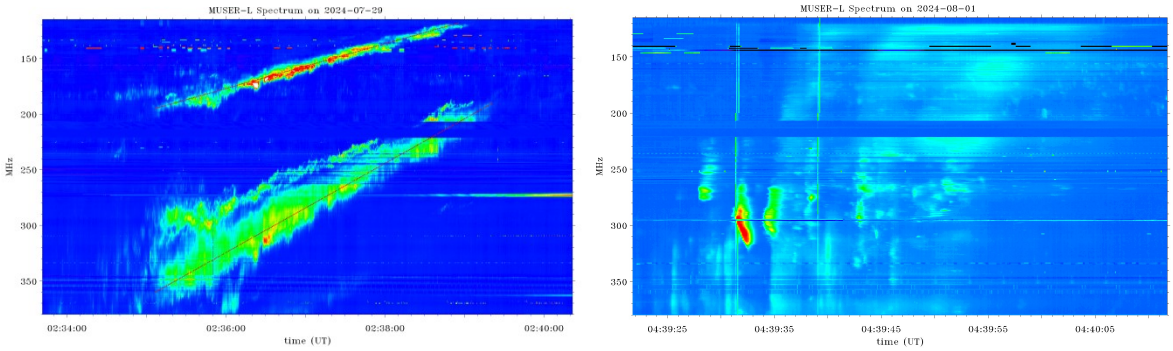

Figure 1. Left panel is type II with more then 4 stripes. Right panel is bidirectional drifting burst.

MUSER-I started observation since 2022 October after upgrading. The daily observation is with spectral resolution of 16 MHz and time cadence of 3.125 millisecond. As a comparison and supplement, one spectrometer (0.4-2.0 GHz) performance daily observation with spectral resolution of 1 MHz and time cadence of 1 millisecond. Some superfine and small scale solar radio bursts will be analyzed and reported.

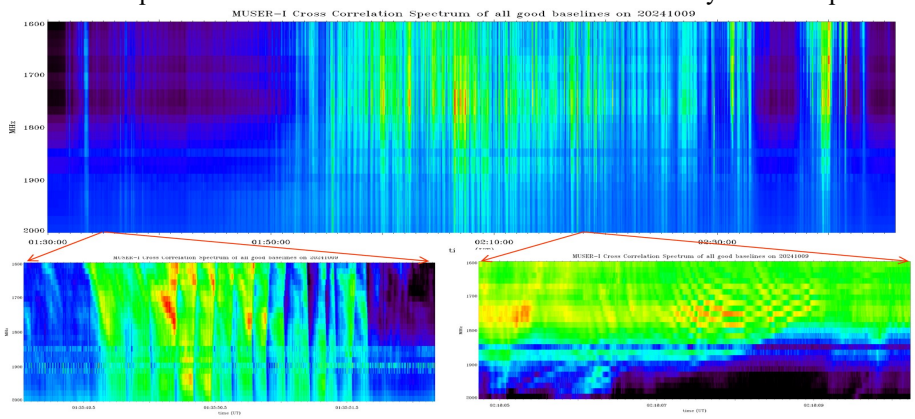

Figure 2. Upper panel shows a long duration QPP. Bottom two panels show drifting QPP and zebra patterns.

The superfine or small scale solar radio bursts are distinctive with high brightness temperature and fascinating features. They are known as type III (or pairs), quasi-periodic pulsations, spiky burst, zebra patterns and so on. They are the driving phenomena to study the energy release and energetic particle acceleration. The high resolution of solar radio imaging observation will give clues to study the physical evolution of coronal heating and help us to understand the origin of the space weather.