This proposal has not been submitted before.

Proposal Type: Regular
General Category: Pulsars
Observation Category: Galactic
Total Time Requested: 10 Hours
Minimum Useful Time: 2 hour

Proposal Title: Towards a new model of interstellar turbulence using pulsar B0834+06

ABSTRACT:
Our previous speckle image towards the pulsar B0834+06 revealed features in the sub-AU structure of the interstellar medium that have engendered a rethink of the nature of interstellar turbulence. We now wish to make a succession of observations of the pulsar B0834+06, supported by HSA two-dimensional speckle imaging, to track the dynamics of this underlying small-scale structure. This will directly test key aspects of several newly-proposed models of interstellar structure. It will distinguish between the two major competing models in which the speckle image structure is either caused by (i) the turbulent cascade of energy associated with velocity and magnetic field fluctuations in the interstellar plasma or (ii) static structures in the ISM, such as those associated with current sheets and sites of active magnetic reconnection. Our observations will also provide new insight into the nature of Extreme Scattering Events, one of which was revealed by our previous work.

<table>
<thead>
<tr>
<th>Name</th>
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<th>Student</th>
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Remote Observing Request

- [ ] Observer will travel to AO
- [X] Remote Observing
- [ ] In Absentia (instructions to operator)

Instrument Setup

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Atmospheric Observation Instruments:

Special Equipment or setup: We would like to record with the PUPPI backend utilising only the minimal possible bandwidth of 100MHz (dual-polarisation, 8-bit recording). We would like the data to be...
recored in baseband mode without any channelisation. Per observation we will thus acquire about 3TB of raw data. We will provide the required disks ahead of time.

RFI Considerations

Frequency Ranges Planned