Technical Page

Proposal Type: Regular
General Category: Pulsars
Observation Category: Galactic
Total Time Requested: 21 Hours

Proposal Title: Scintillation Arcs in Weak Scattering – PSR B1133+16

ABSTRACT:
We propose to measure dynamic spectra of ISS of the well-studied pulsar B1133+16. The difference is that we wish to observe when the intensity fluctuations are weak. The "secondary-spectra" of this source in strong scattering, formed by a 2-D spectral analysis of the dynamic spectrum, show "parabolic arcs" and a variety of peculiar substructure. In weak scattering the secondary spectra can be directly inverted (except for a two-fold ambiguity) to estimate the full 2-D spatial spectrum of the electric field. This will allow us to estimate the 2-D structure of both the plasma turbulence and the source with high resolution. We are particularly interested in: (1) the cause of the peculiar substructure in the strong scattering observations, which we suspect is anomalous plasma structure; and (2) the anisotropy and the inner scale of the turbulence. We should be able to measure an inner scale as small as 8000 km; (3) any source structure effects, such as a shift in the position of the emission region with pulse phase. We should be able to resolve spatial source structure as small as 8000 km.

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<tr>
<th>Name</th>
<th>Institution</th>
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<th>Phone</th>
<th>Student</th>
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<tbody>
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Service Observing Request

None
All of the observing run.
Part of the observing run.
Queue Observing

Remot e Observing Request

No
Maybe
Yes

Instrument Setup

610 L-wide C 327

Atmospheric Observation Instruments:

Special Equipment or setup: WAPP stacked to cover 800 MHz of instantaneous bandwidth with summed polarizations.
RFI Considerations

Frequency Ranges Planned