

Technical Page

Proposal Type: Regular
 General Category: Pulsars
 Observation Category: Galactic
 Total Time Requested: 40 Hours
 Minimum Useful Time: 3-4 hours

Proposal Title: A survey of high time resolution single pulse absolute polarimetry of pulsars: Probing the coherent radio emission problem

ABSTRACT:

Recently Mitra et al. (2009) have shown that occasionally single pulses are highly linearly polarized, having a sign changing circular and its polarization position angle following locally the mean position angle traverse. They argue that this is a typical signature of curvature radiation in vacuum. However, theoretically only the extraordinary mode can escape from the pulsar magnetosphere preserving its vacuum like properties. This is in contradiction with observations of circular polarization and OPM in pulsar radiation, where both extraordinary and ordinary mode need to be present. Further sensitive single pulse polarimetry is essential to understand the origin of circular and OPM in pulsars. Mitra et. al.'s single pulses were associated only with the primary (stronger) polarization mode, and hence an important question is if such single pulses are present in the secondary (weaker) polarization modes. Also a key to understand the pulsar emission process lie in how the smaller units of emission average to form these highly polarized single pulses. With an aim to answer these questions we propose to do a systematic survey of high time resolution single pulse polarization of bright pulsars. The Arecibo telescope is uniquely suited for this purpose due to its high sensitivity and available backends that can yield high time resolution data. **We request 40 hours of observations, with 20 hours each at P and L band, to observe 20 strong pulsars.**

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Remote Observing Request

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

Instrument Setup

Atmospheric Observation Instruments:**Special Equipment or setup:** none**RFI Considerations****Frequency Ranges Planned**

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.

This proposal requires coordination with Punta Salinas radar within the band 1222-1381 MHz..

This proposal requires coordination with GPS L3 at 1381 MHz.