

Technical Page

Proposal Type: Regular
 General Category: Pulsars
 Observation Category:
 Total Time Requested: 20 Hours
 Minimum Useful Time: 60 min

Proposal Title: NANOGrav precision timing: ISM irregularities toward pulsar B1937+21

ABSTRACT:

The NANOGrav collaboration is initiating a systematic study of the ISM properties toward the best timing pulsars in our source list. Our mid-term goal is to reduce timing noise in our best Arecibo pulsars down to the 10 ns level. Currently, our best timing pulsar, J1713+0747, has an rms timing residual of 40 ns. The very bright (original) millisecond pulsar, B1937+21, exhibits long-term timing irregularities. But, on timescales of a year or so it has excellent timing characteristics. We seek to use the techniques developed in a previous proposal (P2627, Palliyaguru et al.) to better characterize the ISM timing noise along the line of sight to B1937+21. We will use the cyclic spectroscopy technique developed by several of our team members (Demorest; van Straten) in order to reconstruct the impulse response function of the ISM at three frequencies and correct the arrival time data for ISM effects.

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Remote Observing Request

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

Instrument Setup

430 G L-wide 327

Atmospheric Observation Instruments:

Special Equipment or setup: We expect to collect about 10 TB of data in total since this is baseband recording with typically 4 x 10 MHz bands. We will bring external disk drives to the Observatory to transport the data to our home institutions.

RFI Considerations

Frequency Ranges Planned

307 - 347 MHz

418 - 442 MHz

1150 - 1730 MHz

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