Technical Page

This proposal has not been submitted before.

Proposal Type:    Regular
General Category:  Pulsars
Observation Category: Galactic
Total Time Requested:  35 Hours
Minimum Useful Time:  45 min.

Proposal Title: A search for compact, low-mass planetary systems around solitary millisecond pulsars

ABSTRACT:

We propose to carry out high-cadence, sub-microsecond precision timing measurements of two solitary, high space velocity millisecond pulsars, PSR J1923+2515 and PSR J1944+0907 at 430 MHz, and using the PUPPI backend hardware. Ideally, we would like to observe every day for one month. The goal of these measurements is to possibly uncover a population of very low mass, compact orbit planets around neutron stars that would not be detectable by the typical, long-term, low-cadence timing programs, including NANOGrav. This approach has a potential to solve the long-standing problem of the frequency of occurrence of pulsar planets. Using the planets pulsar, PSR B1257+12 as an example, we have demonstrated that that the high-cadence, 0.5 microsecond timing precision measurements of this source can provide new exciting results, including better characterization of the orbit of the inner planet, and a possible detection of a microsecond amplitude, 3-day period in the timing residuals.

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

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

Instrument Setup

430 G

Atmospheric Observation Instruments:
Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

420 - 440