Technical Page

Proposal Identification No.: P1870  Date Received: 2004-Oct-01 21:07:00

Proposal Type: Regular  General Category: Pulsars  Sub-Category: Continuum  Observation Category: Galactic  Total Time Requested: 6 Hours

Proposal Title: CONFIRMATION OF A VERY FAST MILLISECOND PULSAR

ABSTRACT:

During the course of a systematic search of high-energy EGRET gamma-ray error boxes with the Parkes radio telescope we have found a potential new 1.65 ms pulsar that, if confirmed, would be one of only three pulsars spinning faster than 600 Hz. One attempt to confirm this candidate with the Parkes telescope has been unsuccessful, but it is quite possible that re-detecting such a pulsar could take several attempts since: 1) The candidate’s signal-to-noise peaks at a (low) DM of 30.6 pc cm$^{-3}$, making scintillation a potentially important factor. 2) The candidate is highly accelerated and would definitely be in a binary system. It is possible that we detected the pulsar at a relatively unaccelerated part of its orbit, and that often it is more highly accelerated. 3) Such a fast pulsar will likely be releasing a large amount of spin-down energy, and may be ablating its companion (c.f. the "Black Widow" binary PSR B1957+20, which has a period of 1.6 ms), causing (potentially long) eclipses of the pulsar. We propose to use the Arecibo telescope and the Wideband Arecibo Pulsar Processors at L-Band (1400 MHz) and P-Band (327 MHz) to confirm this candidate.

<table>
<thead>
<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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</tbody>
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Service Observing Request

- [X] None
- [ ] All of the observing run.
- [ ] Part of the observing run.
- [ ] Queue Observing

Remote Observing Request

- [ ] No
- [ ] Maybe
- [X] Yes

Instrument Setup

- L-wide 327

Atmospheric Observation Instruments:

Special Equipment or setup: none
RFI Considerations

Frequency Ranges Planned

1120-1600
312-342

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.