

Technical Page

Proposal Type: Regular
 General Category: Pulsars
 Observation Category:
 Total Time Requested: 30 Hours
 Minimum Useful Time: 1 hour 15 minutes

Proposal Title: Continued Timing of the Young Relativistic Binary PSR J1906+0746

ABSTRACT:

We propose monthly 2.5-hour timing observations of PSR J1906+0746, the relativistic binary pulsar identified in the PALFA survey data. This young pulsar is in an eccentric 4-hour orbit. Our timing observations over the past few years have allowed us to measure the time dilation and gravitational redshift as well as the shift of periastron passage, resulting in mass estimates for the pulsar and its companion, which indicate that the companion is a second neutron star. We currently have a marginal detection of the orbital period decay and expect it to improve greatly with another year or so of data. This measurement will overconstrain the system and provide a test of strong-field gravity. The pulsar also shows strong profile evolution with time, which we are using to investigate the pulsar’s 2-dimensional beam shape and the phenomenon of geodetic precession. The high level of timing noise and quickly-evolving profile make it even more essential that we obtain regular observations with Arecibo: frequent observations are required for the best possible timing, and high-quality profiles at each epoch are needed in order to effectively map the pulsar’s beam. Finally, we will continue to search for radio pulsations for the companion star in all of the data acquired.

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Remote Observing Request

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

Instrument Setup

L-wide

Atmospheric Observation Instruments:

Description of Observer Equipment: ASP

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

1390-1440

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

This proposal requires coordination with GPS L3 at 1381 MHz.