

Technical Page

This proposal has been submitted before.

The previous proposal number is P2650.

Proposal Type: Regular
 General Category: Pulsars
 Observation Category: Galactic
 Total Time Requested: 12 Hours
 Minimum Useful Time: 1.0

Proposal Title: Long Term Timing of PSR J0348+0432: A Unique and Powerful Laboratory for Extreme Gravity

ABSTRACT:

We propose to continue long-term timing of the relativistic binary pulsar system J0348+0432, with the goal of improving our precision measurement of the decay of the orbital period from gravitational wave emission. The pulsar has a white dwarf companion with mass $M_c = 0.172 M_{\text{sun}}$, and the pulsar mass is $M_p = 2.01 M_{\text{sun}}$. According to some theories of gravity, the large difference in the compactness of these objects and the tight 2.46-hr orbit should cause significant emission of dipolar gravitational waves. Our measurement of the orbital decay is, however, in good agreement with general relativity and has allowed us to rule out significant phase space for the scalar field coupling constants in Scalar-Tensor theories of gravity. Continued Arecibo pulsar timing will improve the precision of our orbital decay measurements. This will further tighten the constraints on alternative theories of gravity, and provide more precise mass estimates.

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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:

Special Equipment or setup: PUPPI is primary. WAPPs are back-up.

RFI Considerations

Frequency Ranges Planned

1150 - 1730

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

This proposal requires coordination with GPS L3 at 1381 MHz.