

Technical Page

Proposal Type: Regular
 General Category: Pulsars
 Observation Category:
 Total Time Requested: 24 Hours
 Minimum Useful Time: 1 hour

Proposal Title: Long Term Timing of PSR J0348+0432: An Exquisite Laboratory for Testing Extreme Physics

ABSTRACT:

We propose to continue long-term timing of the binary pulsar J0348+0432 so as to measure the decay of the orbital period due to the emission of gravitational waves. The pulsar has an optical counterpart determined to be a ~ 0.17 Msun white dwarf, which implies an 80% probability that the pulsar is >2 Msun. Alternate theories of gravity predict that this system should be a strong emitter of dipolar gravitational waves, which differs from general relativity. With an additional two years of timing (the first of which we are requesting here), we should be able to make a $10\text{-}\sigma$ detection of the orbit decay and test these alternative theories. This will also allow us to confirm the optical mass measurement, which will be important for testing the neutron star equation of state if the pulsar is >2 Msun.

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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: none

RFI Considerations

Frequency Ranges Planned

1120 - 1220

1360 - 1460

1460 - 1560

1560 - 1660

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.