

Technical Page

This proposal has been submitted before.

The previous proposal number is R2080/2169/2288.

Proposal Type: Large
 General Category: Planetary Radar
 Observation Category: Solar System
 Total Time Requested: 54 Hours
 Minimum Useful Time:

Proposal Title: Probing Asteroid Physics, Solar Physics, and Fundamental Physics with Radar Astrometry

ABSTRACT:

We request 54 hours in 2015-2017 to continue a long-term radar program established in 2004. We have been quantifying non-Keplerian effects in the orbits of Near-Earth Asteroids that reach deep inside the gravitational well of the Sun with the following three objectives: 1) to measure Yarkovsky drift rates, which can reveal asteroid masses and thermal properties, 2) to provide a purely dynamical measurement of the solar quadrupole moment J_2 , 3) to refine solar system tests of general relativity (PPN parameter β at the 10^{-4} level). The effects are separable because they produce different signatures on the orbital evolution. The program is nearing the stage where its impact can be realized: at the end of this proposal cycle, we will have accumulated ~ 25 observations of 10 different asteroids over a 15-year period, sufficient to provide 3 Yarkovsky rates, a meaningful estimate of β , and an estimate or upper bound on J_2 .

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Remote Observing Request

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

Instrument Setup

S-band receiver

Atmospheric Observation Instruments:

Description of Observer Equipment: Portable Fast Sampler

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned