Proposal TAC Review Report

Revisiting the Double Pulsar System PSR J0737-3039 Using GBT

Proposer : Aditya Krishna Karigiri Madhusudhan

Primary Reviewer: Francis McGee

Secondary Reviewer: Patrick Horlaville

Presentation

- The proposal requests 36.75 hours of observing time from the Green Bank Telescope (GBT) for the system PSR J0737-3039A/B

- It is motivated to be a relevant observing target as per its unique property to be a double pulsar system.

- The observations are centered towards the measurement of the Post-Keplerian parameters: the periastron advance, the gravitational redshift, the orbital decay and the Shapiro delay, which can all be related to the masses of both pulsars.

- The objective with these measurements would be to constrain the masses of both pulsars.

- This would allow for a better understanding of the magnetospheric properties of pulsars.

- The frequency coverage, determined by the optimization of the measurement of the pulsar spectra, pulse shape, amplitude, and polarization, motivates the use of the Green Bank Telescope.

- The receiver chosen is the Prime Focus 1 (PF1) for the observation at 400 MHz and 800 MHz and the Gregorian at 1.4 GHz, with VEGAS in pulsar mode for the backend processing.

Discussion

- The primary reviewer noted that the proposal was quite over length, and considered that the technical justification is fairly valid.

- The secondary reviewer wonders what order of magnitude of mass constraint is to be expected given the attained sensitivity on the observations.

- A TAC member wonders if there's a typo in the Table 2: Observational Summary, with the confusion limit seemingly being 6 orders of magnitude higher than the sensitivity.