Abstract

* Goal: achieve greater resolving power using the image of a pulsar scattered through the interstellar medium. Such scattering provides an opportunity for interferometry with baselines on the order of an astronomical unit, thus resolving the image to nanoarcsecond precision.
* Big picture: unknown mechanism of pulsars – magnetic field causes pulses? Do they originate from opposite poles of the star?
* Observations: Very Long Baseline Interferometry (VLBI) done at two wavelengths: 150MHz and 325MHz, using the Algonquin Radio Observatory (ARO-Canada), Giant Metrewave Radio Telescope (GMRT-India), Effelsberg 100-m Radio Telescope (Germany) and the Low Frequency Array (LOFAR-Netherlands)
* Testing: Right now in preliminary stages of work. Have taken VLBI observations, but they still need to be resolved, and further observations will be needed to demonstrate the scintillation
* Results: Still making sure we can find evidence of the pulsar at the individual telescopes
* Design and Methods
* Discussion and Conclusion
* My specific project: antenna delay (related to antenna coordinates), folding on an instantaneous period, sequencing code
* What problem did I solve? My work on antenna delays enabled the phasing of data from different telescopes – by which I mean the signal can be constructively added, despite the fact that a particular wavefront would hit each telescope at a different time. Instantaneous folding allowed us to fold on millisecond pulsars, while my sequencing code identifies missing timestamps, as well as the location of the raw files as they are written
* Why does it matter? Greater resolving power might show us something new and unexpected about the pulsar mechanism, and can perhaps be applied to better see these faint sources
* Applications? Observations of pulsars and other radio sources in greater detail (has to be radio, wavelength should be long)
* What separates me from others? I have had mostly a supporting role, helping provide basic information to interpret the observations
* Supportable claims?
* Assumptions?
* What goal did I reach? Helped phase up data from individual telescopes