2MM WAVELENGTH VLBI OF SiO MASERS

S. S. DOELEMAN, *MIT-Haystack Observatory, Off Route 40, Westford, MA, USA 01886*.

Circumstellar envelopes of both proto-stars and evolved stars are rich molecular media which often support astronomical masers of several molecular species. Due to their compact sizes and high brightness temperatures, these masers are valuable dynamical probes of stellar environments, and they can be used as tracers of physical conditions provided the pumping mechanism is understood. Masing transitions of Silicon Monoxide (SiO) are particularly important since they arise in close proximity (1-2 stellar radii) to the host star and probe regions of turbulent outflow. VLBI (Very Long Baseline Interferometry) observations provide angular resolutions commensurate with typical sizes of SiO maser features and allow detailed comparisons of multiple SiO maser transitions to be made. Such comparisons are providing new and surprising input to models of the SiO maser pump. Here we report on new efforts to extend the frequency range of the VLBI technique to allow observations of high frequency (129GHz) ro-vibrational maser transitions of SiO. These observations are being carried out on the baseline between the Sub Millimeter Telescope 10m and the Kitt Peak 12m telescope, both run by the Arizona Radio Observatory.