

Very Large Array monitoring of 1720 MHz OH masers toward the Galactic Center

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We present the first variability study of the 1720 MHz OH masers located in the Galactic Center. Most of these masers are associated with the interaction between the supernova remnant SgrA East and the interstellar medium, but a few masers are associated with the Circumnuclear Disk. The monitoring program covered five epochs and a timescale of 20-195 days, during which no masers disappeared and no new masers appeared. All masers have previously been detected in a single epoch observation about one year prior to the start of the monitoring experiment, implying relatively stable conditions for the 1720 MHz OH masers. No extreme variability was detected. The masers associated with the northeastern interaction region between the supernova remnant and the +50km/s molecular cloud show the highest level of variability. This can be explained with the +50km/s molecular cloud being located behind the supernova remnant and with a region of high OH absorbing column density along the line of sight. Possibly the supernova remnant provides additional turbulence to the gas in this region, through which the maser emission must travel. The masers in the southern interaction region are located on the outermost edge of SgrA East which line of sight is not covered by either absorbing OH gas or a supernova remnant, in agreement with the much lower variability level observed. Similarly, the masers associated with the CND show little variability, consistent with them arising through collisions between relatively large clumps of gas in the CND and no significant amount of turbulent gas along the line of sight.

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