



## ExtraGalactic H<sub>2</sub>O Masers with SVLBI

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The space-VLBI experiments with the RadioAstron have resulted in a series of detections of the maser emission in two powerful H<sub>2</sub>O MegaMaser galaxies. The masering regions in NGC 3079 were detected only at a 1.9 Earth Diameter (ED) baseline and they are found to be part of an expanding super-bubble shell placed in front of the nuclear region of the galaxy that is expanding towards the observer at a velocity of -100 km/s. The emission regions are extended across the front edge of an expanding shell and the excitation of the molecules results from shock heating in the shell. The masering regions in NGC 4258 have been detected at multiple epochs with Earth-Space baselines from 1.3 to 26.9 ED. In NGC 4258 the masering regions are found to be individual clouds passing in front of the nuclear black hole with a velocity of about 1050 km/s at a radius of 0.15 km/s. The masering clouds are embedded inside a 0.6 parsec thin accretion disk and the presence of the water molecules and their excitation relates to the viscous heating in the disk combined with X-ray heating from the nuclear source. The presence of individual clouds inside a thin accretion disk is revealing for the structure of the disk and the detection of magnetic fields in those clouds shows that the viscosity in this lower power disk is dominated by the magnetic fields. In this paper we present the results for NGC 3079 and three detections of NGC 4258 at Earth-space baselines of 1.3, 9.5 and 19.5 ED.