

# The faint radio nucleus of the megamaser galaxy IC485: AGN or SF activity?

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## Content

Water masers associated with AGNs (the 'megamasers') constitute a unique way to directly map the molecular gas at (sub-)parsec distance from SMBHs and, hence, to study the physical properties, the structure, and the kinematics of the gas surrounding the central engine. In particular, high angular resolution radio continuum and maser observations have been used to test the alignment of the radio jets and the rotation axis of accretion disks and to pinpoint regions of strong interaction of low power jets and/or nuclear outflows with the interstellar medium in radio quiet AGNs.

Located at a distance of 122 Mpc, IC485 is a spiral LINER/Seyfert 2 galaxy hosting a bright H<sub>2</sub>O megamaser. A recent study indicates that the maser emission might be produced (at least in part) in an edge-on accretion disk oriented north-south, with a radius of 0.24 pc (Ladu et al. 2024). Sensitive radio continuum EVN measurements at 1.7 and 5 GHz, did not show confident emission from the nuclear region, suggesting a diffuse morphology resolved out at the pc-scale.

By taking profit of a resolution intermediate between that of the VLA and VLBI, very recent observations with the e-MERLIN at 1.4 and 5 GHz revealed a flat-spectrum nuclear source, coincident in position with the maser location and with a tentative source visible in our EVN L-band map. The e-MERLIN source is slightly resolved with an orientation of the extended emission approximately perpendicular to that of the putative accretion disk. These characteristics suggest the presence of a weak jet or an outflow in the nucleus of IC485. Here, we present the results of our e-MERLIN observations and discuss them by combining the information obtained from the radio continuum and maser studies, thus providing relevant clues on the maser and radio continuum origin.

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