

A NEW STRONG EXTRAGALACTIC OH MEGAMASER IN THE INFRARED SOURCE
IRAS 17208 -0014

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The powerful OH megamasers detected in IC4553 (Baan et al.1982), NGC3690, Mrk231 (Baan, 1985; Kazès and Dickey, 1985) and Mrk273 (Bottinelli et al. 1985a) show several common properties; in particular, they are strong IR emitters. We have thus undertaken a study of the strongest far IR (100 μm) uncatalogued IRAS sources and we report here on the discovery of a new strong extragalactic maser in the IR source IRAS 17208 -0014 (Bottinelli et al., 1985b)

The HI line, the OH 1667 and 1665 MHz main lines and the 21-cm continuum observations have been obtained with the Nançay radio telescope. The optical spectrum has been obtained at the European Southern Observatory.

1. OBSERVATIONS

The optical spectrum shows low excitation lines at heliocentric radial velocity $12730 \pm 90 \text{ km s}^{-1}$, from which we adopt a distance of 170 Mpc ($H_0=75$). The galaxy appears then to be a very strong IR emitter, with a luminosity of a few $10^{12} L_\odot$. The reddening, determined from Balmer decrement is larger than 7 mag. in the visible range. Though high, this value is typical of IRAS starburst galaxies.

The 21-cm spectrum shows an unusually broad ($\sim 660 \text{ km s}^{-1}$) HI absorption feature, with no emission counterpart, centered at $12790 \pm 20 \text{ km s}^{-1}$, in good agreement with the optical determination.

From the measured continuum radio emission, $T_A=90 \text{ mJy}$, and assuming that the HI covers the nuclear source, we deduce an optical depth of 0.13 and an HI column density N given in terms of the spin temperature T , $N/T=1.6 \times 10^{20} \text{ cm}^{-2} \text{ K}^{-1}$.

Both OH 1667 and 1665 main lines are detected, with no indication of circular polarisation. As in the case of the 4 other extragalactic megamasers, and particularly Mrk273, the 1667 MHz line shows two components, about 100 km s^{-1} apart. The hyperfine ratio is equal to about 3 and the isotropic luminosity at 1667 MHz is one of the largest observed up to now: $1200 L_\odot$

2. DISCUSSION

The 5 extragalactic megamasers observed up to now have several common properties. The more particularly striking ones are:

- 1- strong IR luminosity
- 2- evidence of non-circular motions and/or mass ejection from the very broad HI absorption lines
- 3- they belong to a new class of masers, several order of magnitudes most powerful than the only known galactic masers prominent in the OH 1667 and 1665 MHz main lines, i.e. those appearing in molecular clouds or in circumstellar shells.

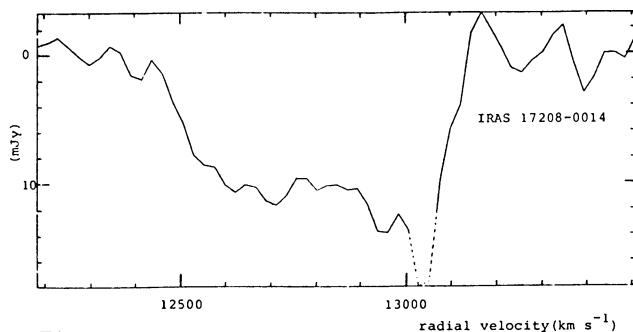


Figure 1: HI spectrum

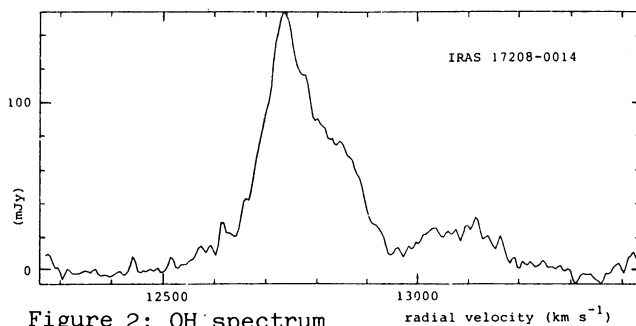


Figure 2: OH spectrum

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