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EXTRAGALACTIC OH MEGAMASERS IN STRONG IRAS SOURCES

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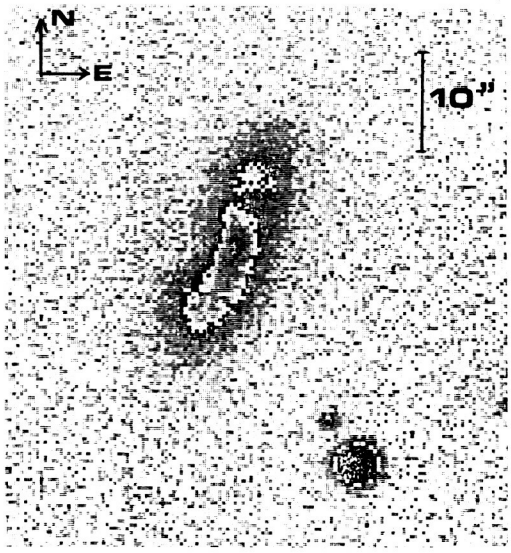
From our OH and HI survey of the strongest far-infrared (λ= 60 or 100 μm) IRAS sources, we have discovered 3 new powerful OH megamasers in Arp 148, IRAS 1510+0724 and in the uncatalogued IRAS source,IRAS 17208-0014 (Bottinelli et al. 1985b, 1986).

The HI line, the OH 1667 and 1665 MHz main lines and the 21-cm continuum observations have been made with the Nançay radio telescope. The optical spectra and images have been obtained at the European Southern Observatory (Fig.1).



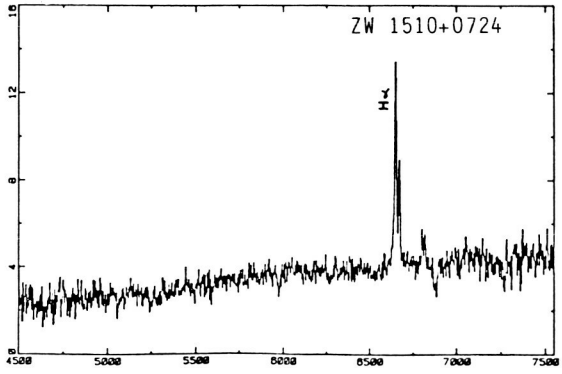


Fig.1- CCD picture obtained in R, at the ESO 2.20m telescope (left) and calibrated IDS spectrum obtained at the ESO 3.60 m telescope (above) for the galaxy ZW 1510+0724.

The spectra are displayed in the following figures (Fig. 2a-d) together with the main IR and OH properties of the 8 megamasers detected up to now, including IC 4553 (Baan et al., 1982), NGC 3690 and Mrk 231 (Baan, 1985), Mrk 273 (Bottinelli et al., 1985a) and III ZW35 (Chapman et al., 1986) (Figure 3).

Particularly striking features are :

1- strong IR luminosity.
2- nearly edge-on optical inclinations.
3- evidences of large optical thicknesses as judged from the 12, 25, 60 and 100 μm flux ratios and optical spectra.
4- correlated IR and OH (1667 MHz) luminosities (Fig.3).
5- evidence of non-circular motions from HI absorption lines. Among all OH mega-

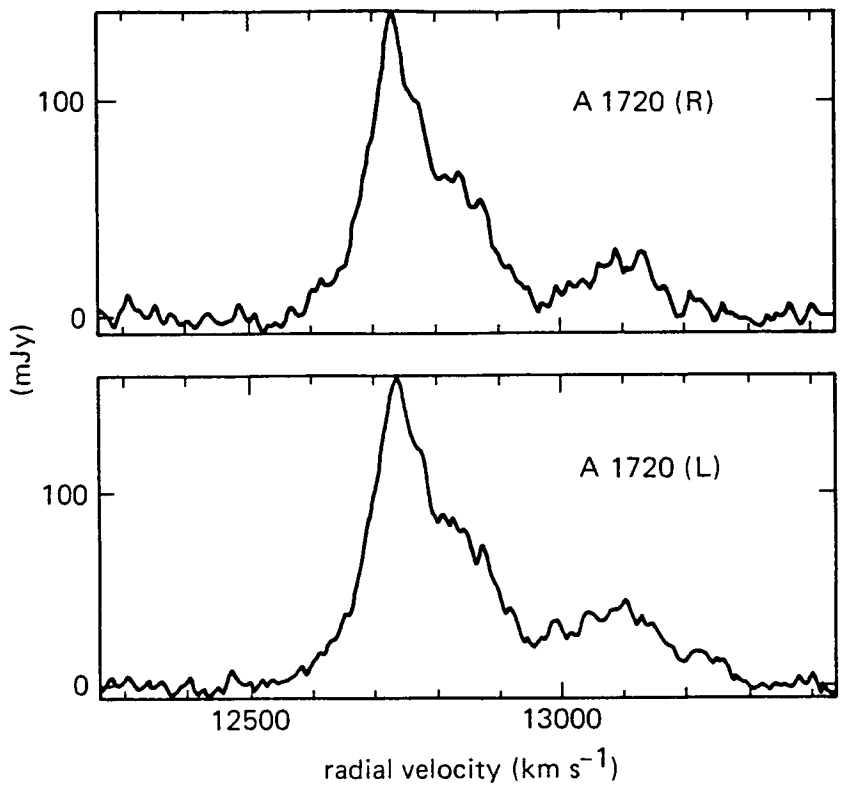


Figure 2a: OH spectrum of A 1720 centered for the rest frequency of the 1667 Mhz transition with a velocity resolution of 4.5 Km s^{-1}. Radial velocities are given in terms of heliocentric optical redshift $c\Delta\lambda / \lambda_o$. The central feature corresponds to the 1667 Mhz transition. The redshifted secondary feature corresponds to the 1665 Mhz transition. Upper part: right circular polarization. Lower part: left circular polarization. There is no evidence of circular polarization larger than about 15%.

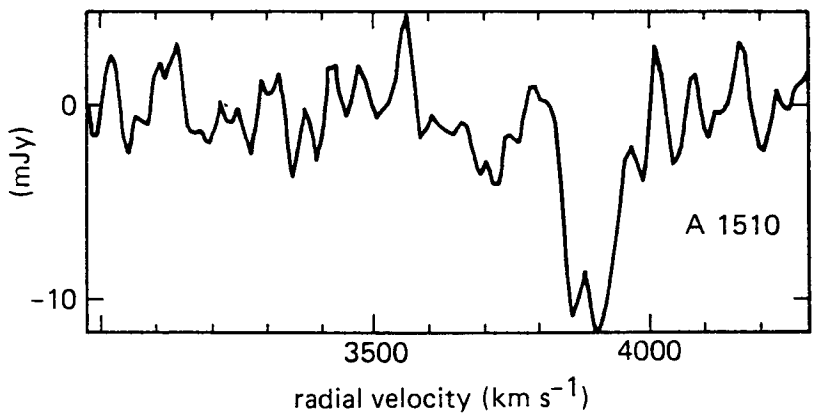


Figure 2b: HI profile of A 1510 with a velocity resolution of 10 Km s^{-1}. Radial velocities are given in terms of the heliocentric optical redshift $c\Delta\lambda / \lambda_o$.

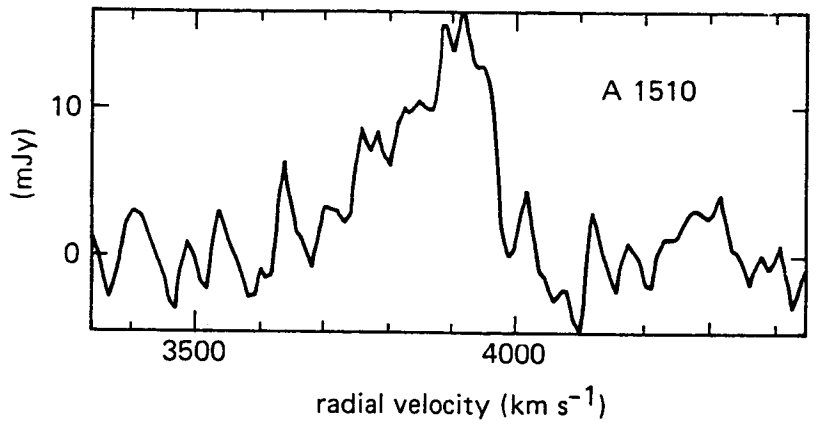


Figure 2c: OH spectrum of A 1510 centered for the rest frequency of the 1667 Mhz transition with a velocity resolution of 9 Km s^{-1}. Radial velocities are given in terms of the heliocentric optical redshift $c\Delta\lambda / \lambda_o$. The secondary feature (at about 4300 Km s^{-1}) corresponds to the 1665 Mhz transition.

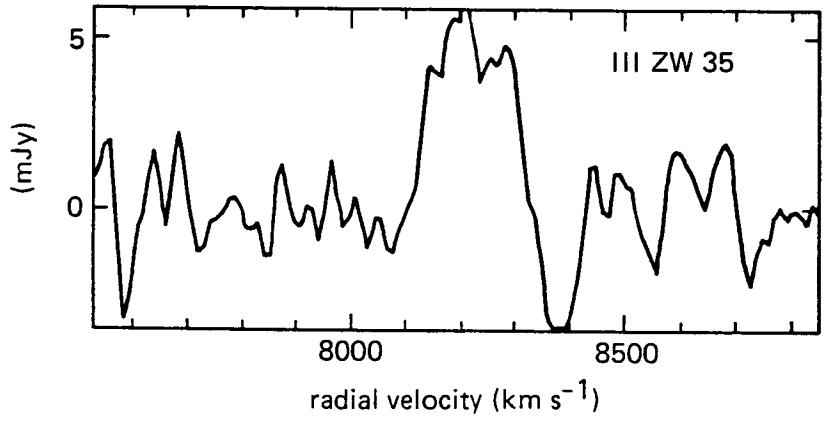


Figure 2d: HI profile of III Zw 35 with a velocity resolution of 10.5 Km s^{-1}. Radial velocities are given in terms of heliocentric optical redshift $c\Delta\lambda / \lambda_o$. (Note the absorption feature at about 8300 Km s^{-1}.)

masers presented in Figure 3, these motions seem to be the largest for the strongest IR emitters, thus suggesting a relation with the stronger star formation activity.

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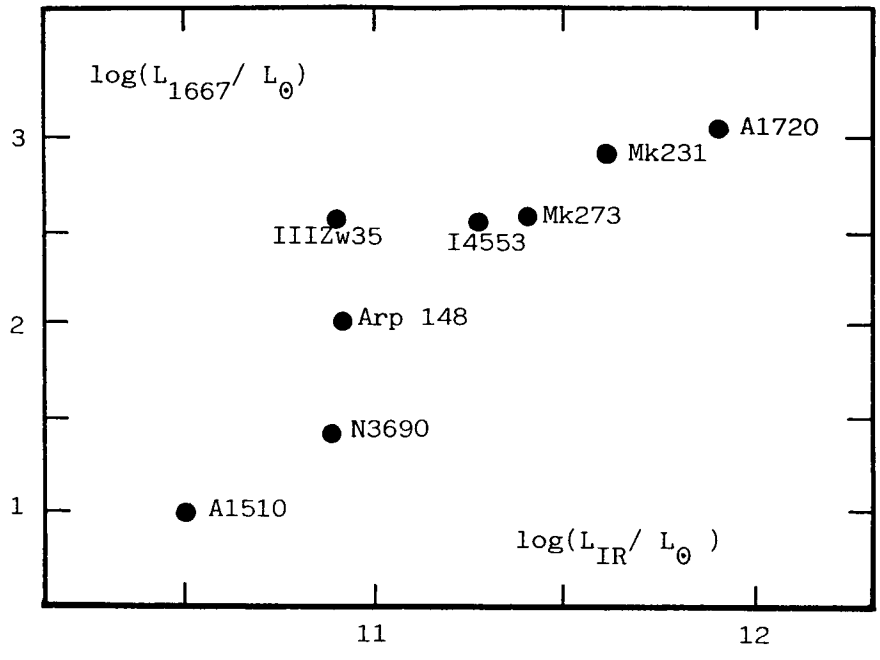

Fig 3 - Isotropic luminosity at 1667 MHz vs. far-infrared luminosity determined from IRAS data,for megamaser galaxies.