

**R04a                    Detection of outer Galactic rotation through phase-referencing VLBI  
astrometry of water masers**

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We measured proper motions of water masers in Galactic star forming region IRAS21008+4700 relative to celestial position of an adjacent extragalactic continuum source ICRF2100+468 which is 0.18 degree from the maser source. The observations were carried out in 1998 by VLBA at 22GHz in two epochs separated by a month in the phase-referencing mode with source switching cycle of 40 seconds. We found that two maser features detected with LSR velocities around -36km/s and -71km/s moved along the Galactic plane by about  $0.46 \pm 0.05$  mas and  $0.37 \pm 0.07$  mas, respectively.

A simple flat rotation model of the Galaxy predicts a kinematic distance of IRAS21008+4700 of 7.3kpc, and a transversal velocity of 150km/s or 0.38mas/month. Thus, we think that the detected proper motions are mostly due to the Galactic rotation.

We also measured proper motions of water maser in W3(OH) relative to adjacent extragalactic source ICRF0241+622. The observations were carried out in the similar observing mode IRAS21008+4700. Proper motions of the order of 0.5mas/month are clearly detected which apparently show compound effects of the Galactic rotation, solar motion and annual parallax.

These results seem to show a feasibility of the phase-referencing VLBI maser astrometry in the Galactic dynamics.