

[IM12] Water in Protostellar Disk and Outflow:
H₂O Masers in NGC 1333 IRAS 4

Geumsook Park^{1,2}, Minho Choi¹

¹*Korea Astronomy and Space Science Institute, Daejeon*

²*Department of Astronomy and Space Science, Chungnam National University,
Daejeon*

NGC 1333 IRAS 4 is a multiple protostellar system. Among the young stellar objects in this region, IRAS 4A is a relatively close protobinary system. A1 is brighter than A2 in the radio continuum emission, but the outflow driven by A2 is more powerful. IRAS 4BI, another protostar in this region, drives a bipolar outflow. We observed the NGC 1333 IRAS 4 region in the 22 GHz H₂O line with an angular resolution of 0.08 arcsec using the Very Large Array in the A-array configuration. Out of the twelve maser spots detected, eight spots are associated with A2, and the others with BI. Among the A2 maser spots, six of them are located very close (< 100 AU) to the continuum source A2, and they are probably related with the circumstellar disk. Water maser was not detected near A1, indicating that the A2 disk is more active than the A1 disk. BI maser spots are distributed along a straight line, and they are probably associated with the outflow.

[IM13] Properties of the molecular cloud in the Ophiuchus Region

이대희¹, 선광일¹, 남옥원¹, 한원용¹, 민경욱²

¹한국천문연구원, ²한국과학기술원

We present the first far-ultraviolet (FUV: 1370–1670Å) image of the Ophiuchus molecular cloud region observed with the SPEAR/FIMS imaging spectrograph. An FUV continuum map of the Ophiuchus region shows that the diffuse FUV radiation is mainly the dust scattered photons from nearby bright stars. We have divided the FUV continuum map of the Ophiuchus region into five sub-regions according to their FUV intensities, and obtained an H₂ fluorescent spectrum of each sub-region. Synthetic models of the H₂ fluorescent emission find that there is a uniform foreground cloud over the Ophiuchus region with a physical condition of $n_{\text{H}} = 500 \text{ cm}^{-3}$ and $N(\text{H}_2) = 2 \times 10^{20} \text{ cm}^{-2}$. The foreground cloud seems to be also the major source of FUV continuum, except the Ophiuchus core region where dust in dense molecular clouds dominate FUV scattering.