

[KVN-03] Statistical Studies Based on SiO and H₂O Maser Survey toward Evolved Stars

Kim, Jaeheon^{1,2,3}, Cho, Se-Hyung^{2,4}, and Kim, Sang-Joon³

¹*Yonsei University Observatory,*

²*Korean VLBI Network, Korea Astronomy and Space Science Institute,*

³*Dept. of Astronomy and Space Science, Kyung Hee University,*

⁴*Dept. of Astronomy, Yonsei University*

We report extensive statistical analyses based on the simultaneous observational results of SiO and H₂O masers toward 166 known both SiO and H₂O maser sources (Kim et al. 2010), 83 known SiO maser sources (Cho & Kim 2012 submitted), and 152 known H₂O maser sources (Kim et al. 2012 in preparation). We investigate mutual relations between SiO and H₂O maser properties (peak and total flux density ratios, full line width ratios, and velocity structures etc.) according to stellar pulsation phases and type of evolved stars. These statistical results are compared with monitoring observational results of some individual stars. In addition, a relation between the full line width of SiO/H₂O masers and stellar mass loss rates is examined. For 401 observed stars, we also investigate characteristics of SiO and H₂O maser properties related with evolutionary stages in the IRAS two-color diagram.

[KVN-04] Simultaneous observations of SiO and H₂O masers toward AGB and post-AGB stars

Dong-Hwan Yoon^{1,2}, Se-Hyung Cho^{2,3}, Jaeheon Kim^{2,4,5}, Chi-Young Cho^{2,6},
Youngjoo Yun⁴ and Yong-Sun Park¹

¹*Seoul National University,* ²*Korea Astronomy and Space science Institute,*

³*Yonsei University,* ⁴*Yonsei University Observatory,*

⁵*Kyung Hee University,* ⁶*Sejong University*

We performed simultaneous observations of SiO $v=1, 2$, ²⁹SiO $v=0, J=1-0$ and H₂O 6₁₆-5₂₃ maser lines toward 132 AGB and 183 post-AGB stars in order to investigate how evolutionary characteristics from AGB to post-AGB stars appear in these two maser emissions. The observations were carried out from 2011 February to 2012 March using the Korean VLBI Network 21-m radio telescopes. We have detected SiO and/or H₂O maser emission from 29 sources out of 183 post-AGB stars including 19 new detections. Of 132 AGB stars which are mainly selected based on the IRAS Point Source Catalog, we detected SiO and/or H₂O maser emission from 38 stars including 18 newly detected sources. An evolutionary characteristic from AGB to post-AGB stars is discussed in IRAS two-color diagram. It is found that SiO $v=2, J=1-0$ maser emission without SiO $v=1$ maser detections was detected from 8 sources among 21 SiO detected post-AGB stars and the intensity of SiO $v=2, J=1-0$ maser tends to be much stronger than that of SiO $v=1$. We also found that for the post-AGB stars the maser detection rate of blue group sources (which have higher outflow velocities than red group) are higher than that of red group. Especially, only H₂O maser emission was detected from 7 sources among 94 red group sources without SiO maser detections.