

R07a Nuclear Stellar Disk Nature in the Kinematics of SiO Maser Stars around Sgr A*

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We would like to present the detailed analysis of the kinematics of SiO maser stars around the center of the Milky Way, Sgr A*. We used the archive data in the SiO $v = 1$ $J = 2 - 1$ emission line obtained by ALMA in 2017 and 2021 (2016.1.00940.S, PI Darling, J. and 2019.1.00292.S, PI Paine, J.). Since the SiO $v = 2$ emission line is much weaker than the SiO $v = 1$ emission line in this sample, we used only the latter. We detected 37 SiO maser stars in the channel maps and derived the positions and LSR velocities of the objects. We derived the proper motions of 35 stars by comparing their positions relative to Sgr A* at the two epochs. We estimated the 3D motions from the proper motions and LSR velocities. The first results have already been presented at the ASJ Autumn Meeting 2024. Although the 3D motions within the projected distance of 5.5×10^{18} cm are roughly consistent with Kepler orbits around Sgr A*, whose mass is assumed to be $4 \times 10^6 M_{\odot}$, there may be slightly additional mass in this region. The proper motions of the Nuclear Star Clusters (NSC) derived from WR and O stars are rather random, except for the IRS13E and IRS13N clusters (Tsuboi et al. 2022). However, the derived proper motions of SiO maser stars do not look completely random and show a tendency to lie along the Galactic plane. Moreover, the average proper motion of SiO maser stars are fairly larger than the average LSR velocity. These show that the SiO maser stars around Sgr A* are members of the Nuclear Stellar Disk rather than the NSC.