

Survey of Dense Cores in Orion Molecular Clouds 2, and Detection of Extremely High Velocity Flows

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(オリオン大星雲2領域における高密度コアと高速度フローの探査)

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論文内容の要旨

I investigated new 1.3 mm continuum sources and extensive CO $J = 2-1$ and SiO $J = 5-4$ outflows located at the Orion Molecular Cloud 2 FIR 6 (OMC-2/FIR 6) region. In total, 21 dust continuum sources have been identified and spatially resolved, in which 1.3 mm continuum sources have a dust mass between ~ 0.02 to $0.9 M_{\odot}$ with 1.3 mm ALMA observation. I calculated the dust continuum mass of each source using the integrated flux value measured by Dendrogram using $T \sim 25$ K. I confirmed that 1.3 mm continuum sources correspond to the previously known 11 sources and discovered 10 new additional sources. Both CO and SiO emissions were detected only in FIR 6 - ALMA 13, and the CO Extremely High Velocity (EHV) flow can be seen only in FIR 6 - ALMA 5. FIR 6 - ALMA 5 and FIR 6 - ALMA 13 clearly show redshifted and blueshifted bipolar outflow. The complexity of the CO line emission is attributed to contamination from the ambient molecular cloud and it is difficult to determine which object drives outflow. In conclusion, three sources are clearly associated with bipolar outflow and six sources are with moderate outflow. In OMC-2/FIR 6, the detected sources show various evolutionary stages, starless core, Class 0 phase and Class II phase, in which the half of sources associated with outflows. More than half of the continuum sources did not associate with an infrared source. Thus, OMC-2/FIR 6 is very younger star formation region than previous observation results and it is highly possible that there are many starless cores.