P107a ALMA fragmented source identification in OMC-2 north

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The Orion Molecular Cloud 2 (OMC-2) region in the northern part of Orion A (d = 400 pc) is known as an embedded protocluster containing a large number of infrared sources (400 pc^{-2}; Lada and Lada 2003). In OMC-2 region, fifteen young sources are clustering within three millimeter sources, FIR3, FIR4, and FIR5 (Chini et al. 1997, Farlan et al. 2016). Using the Atacama Large Millimeter/submillimeter Array (ALMA), we have performed mosaic observations toward FIR 3, 4, and 5, covering an area of 0.35 pc × 0.23 pc (∼ 2'.9 × 1'.9), in the 1.3 mm dust continuum, CO (J=2–1) line, and SiO (J=5–4) line emissions. We have achieved dust mass sensitivity of $\sim 3 \times 10^{-5} M_\odot$ at $T = 15$K. The angular resolution is three times higher than that in previous studies. Based on the continuum image, we identified 51 dust sources with the dust mass range of 4×10^{-5} – $1 \times 10^{-2} M_\odot$. With the CO emission, we identified 12 outflows associated with the detected dust sources. In addition, within the embedded cluster, we detected SiO emissions originated from the shocked regions associated with and without outflows. Our results also show direct evidences of interaction between the FIR4 and an energetic outflow driven from the FIR3. In this talk, we discuss physical properties of identified dust sources, how identified molecular outflows interact with other cluster members, and how the interactions might affect the consequential star formation within the embedded cluster at their earliest evolutionary stage.