

P140a **Role of the magnetic field in ≤ 100 AU: New insights on star formation revealed with ALMA**

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With the longest baseline currently available with ALMA, we have performed linear polarization observations in 1.1mm continuum emission toward a candidate of the youngest intermediate mass protostellar source embedded within the Orion Molecular Cloud. We have achieved the spatial angular resolution of $0''.03 \times 0''.02$ that corresponds to the linear size scale of ≈ 10 AU at the distance to the source. Our image demonstrated in great details the distribution of material and changes of measured polarization vectors within a size scale of similar to the solar system. Detected polarization vectors are spatially resolved and clearly show organized structures. Assuming that the grain alignment caused by the radiation torque plays a major role for the observed polarized emission, our result suggests: (1) that the magnetic field vectors are parallel to the major axis of the detected disk-like structure which is consistent with the cloud scale magnetic field direction, (2) while the magnetic field associated with surrounding structure is almost perpendicular to the field associated with the disk-like structure. The changes of field directions from outer area to the central disk-like structure could be explained by the toroidal wrapping of the magnetic fields as predicted by the recent numerical simulations.