

High-resolution Ammonia Mapping of the Protostellar Core Cha-MMS1

Miikka Väisälä¹, Jorma Harju², Maarit Mantere¹, Oskari Miettinen¹
and Malcolm Walmsley^{3,4}

¹Department of Physics, University of Helsinki,
P.O. Box 64, FI-00014, Helsinki, Finland
email: miikka.vaisala@helsinki.fi

²Finnish Centre for Astronomy with ESO, University of Turku,
Väisäläntie 20, FI-21500, Piikkiö, Finland

³Dublin Institute for Advanced Studies, 10 Burlington Road, Dublin 4, Ireland

⁴INAF - Osservatorio Astrofisico di Arcetri,
Largo Enrico Fermi 5, I-50125, Firenze, Italia

Abstract. The nearby protostellar core Cha-MMS1 has been mapped in the NH₃ (1, 1) line and the 1.2 cm continuum using the Australia Telescope Compact Array, ATCA. In addition, observations from Spitzer Space Telescope and Herschel Space Observatory are used to help the interpretation. An elongated condensation with a maximum length of 9000 AU is seen in ammonia. The condensation has a clear velocity gradient directed perpendicularly to the axis of elongation. The gradient can be interpreted as rotation around this axis. We suggest that the observed ammonia structure delineates a rotating envelope and dense gas entrained by a very young protostellar outflow.

Keywords. stars: formation — ISM: clouds — ISM: jets and outflows

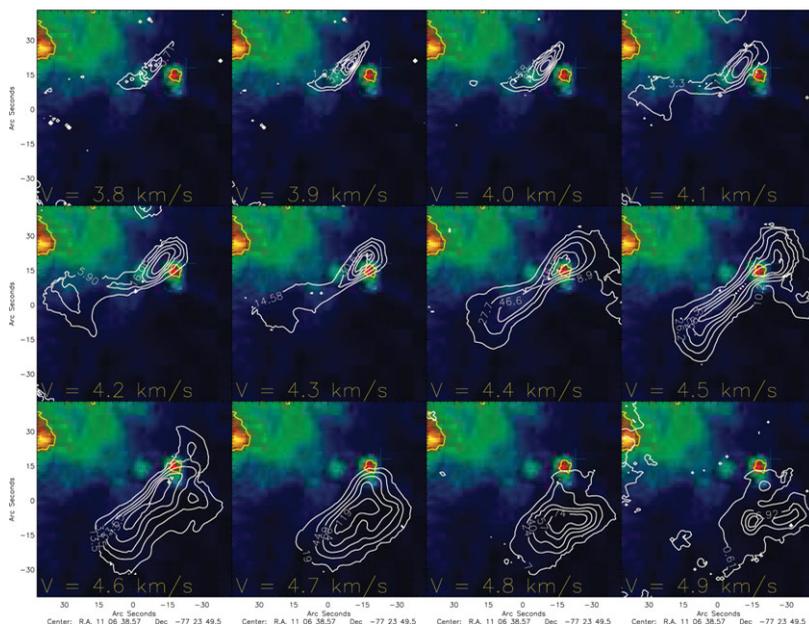


Figure 1. Velocity channel images of NH₃. The color map shows Spitzer 24 μ m continuum. The compact source near the ammonia maximum represents dust heated by an embedded protostar.