

PHYSICAL AND CHEMICAL ANALYSIS OF ORION KL

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We studied excitation of interstellar molecules and chemical environment in Orion KL by analyzing more than 200 spectral lines detected by the 45-m telescope at Nobeyama Radio Observatory (NRO).

We decomposed profiles into some velocity components including two newly discovered ones. We obtained rotation temperatures of many interstellar molecules for all velocity components and these components are classified three-dimensionally in terms of radial velocity, line width and rotation temperature. They are: Hot and Quiet region 1, Hot and Quiet region 2, Cold and Quiet region, Hot Core, Expanding Doughnut and Molecular Flow.

Chemical compositions in these velocity components are obtained, and by combining the physical conditions and chemical compositions, we will show that the chemistry in the hot core and the expanding doughnut is strongly affected by large mass loss from IRc2 while chemistry in components corresponding to the rotating disk seems to be explained by the Ion-Molecule reactions.