INVERTING THE POSITION-VELOCITY DIAGRAMS OF MOLECULAR DISCS

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The molecular discs around Young Stellar Objects can be detected through high spatial and spectral resolution observations of their position-velocity diagrams. By mapping a high lying transition of a density-tracing molecule (e.g. HCN, HCO^+, NH_3), the lines should be optically thin and we can expect to see the signature of rotation of the protostellar accretion disc. We present single-dish observations of the S106 system which show evidence for the presence of such a rotating disc. We also discuss a simple disc model which predicts the form of the resulting l-v diagram. With high quality data, we should be able to do the inverse problem that of recovering the disc properties from the l-v diagram. We discuss approaches to this inverse problem both by a Singular Value Decomposition (least-squares) method, and by a Maximum Entropy Method.

IDENTIFICATION OF OUTFLOW EXCITING SOURCES THROUGH AMMONIA OBSERVATIONS

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Using the 37-m telescope of the Haystack Observatory, we observed the (J,K)=(1,1) ammonia transition towards the suspected exciting sources of twelve regions with molecular or optical outflows: L1448, L1455, L1524 (Haro 6-10), RNO 43, HH 34, HH 38,43, Haro 4-255 FIR, NGC 2264 (HH 14-4,6), L43, R CrA, HH 32a (AS353A), and V1331 Cyg. We detected and mapped ammonia emission in nine of these regions.

In five of mapped regions, the spatial coincidence of the high-density gas with the objects previously proposed as exciting sources gives support to those identifications. For L1524 (Haro 6-10) and HH 38,43 we propose a new location for their exciting sources. We detected a radio continuum source and an unusually strong H_2O maser coinciding with the maximum of the ammonia emission in L1448. This region appears to be the site of very recent star formation.

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