A candidate protostellar object in the L1457 / MBM12 cloud

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The association of young T Tauri stars, MBM12A, indicates that L1457 was forming stars not too long ago. With our study we want to find out whether or not there are still signs for ongoing star formation in that cloud. Using the Max-Planck-Millimeter-Bolometer MAMBO at the IRAM 30m telescope we obtained a map of about 8' by 8' centered on L1457 in the dust continuum emission at 230 GHz. Towards the most intense regions in our bolometer map we obtained spectra at high angular resolution in the CS (2-1) and the N2H+(1-0) lines using the IRAM 30m telescope. We find that the cold dust in L1457 is concentrated in several small cores with high H2 column densities and solar masses. The density profiles of the cores are inconsistent with a sphere with constant density. These cores are closer to virial equilibrium than the cloud as a whole. Data from the VLA and Spitzer archives reveal two point sources in the direction of one dust core. One of the sources is probably a distant quasar, whereas the other source is projected right on a local maximum of our dust map and shows characteristics of a protostellar object.

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