Background and Motivation

The submillimeter regime is widely regarded as ideal for the study of protostellar candidates: sources which are actively accreting material through infall. Because these sources remain deeply embedded in their parent molecular cloud cores, they are virtually undetectable in the infra-red regime. Thus, single dish techniques favour the submillimeter, where their intensity is high and resolution is favorable to their detection. However, until the commissioning of the SCUBA continuum detector at the JCMT in 1997, only the brightest protostellar sources (> 5 Jy) were detectable due to limited receiver sensitivity.

The SCUBA array now permits us to observe sources 100 times fainter than previous receivers. Perhaps more importantly, we can now image the surrounding regions rather than just the central peaks and can thus hope to measure the flux profiles of these sources in the outer envelope where material has yet to collapse. This is essential since models of protostellar structure are differentiated by material which has not yet collapsed: Shu (1977) predicts $\rho \propto r^{-2}$ while McLaughlin & Pudritz (1996) predict $\rho \propto r^{-1}$. Flux profiles, combined with radiative transfer models, provide a measure of density distributions.

Here, we present the first 450 and 850 μm maps of the protostellar sources RNO 43, L1448mm and L1448 IRS3 as well as maps of the NGC 1333 IRAS4 system. The resolution of the JCMT is $\sim 8''$ at 450 μm and $\sim 15''$ at 850 μm. Analysis of the flux profile of RNO 43 is the most straight-forward, since it is the only source which is not a member of a multiple system.