# FAR-INFRARED INVESTIGATION OF THE TAURUS STAR-FORMING REGION-- USING THE IRAS DATABASE.

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The Infrared Astronomical Satellite (IRAS) has given us the first completely unbiased sky-survey in the far-infrared with wavebands centred at 12, 25, 60 and 100 microns. Previous work on star-forming regions had involved preselection of likely sites for further study. The Taurus-Auriga complex was selected as the first molecular cloud to be investigated in this study firstly due to its relative proximity (160pc, Cohen and Kuhi (1979)), and secondly because it had already been the subject of several studies in recent years (Elias (1978), Cohen and Kuhi (1979), and Jones and Herbig (1979)) so that its contents are well catalogued. Once a working method has been developed for Taurus it can then be applied to molecular clouds with less well documented populations.

The Taurus clouds were defined as lying between 04h and 05h in R.A. and +16 to +31 degrees in Dec., then the IRAS point-source catalogue was searched for sources with good or moderate quality fluxes (see IRAS Explanatory Supplement) in all three of the shortest IRAS bands. The sources which were selected in this way were then classified into subgroups according to their IRAS colours (Emerson (1985)).

Taurus is generally believed to be an area of low-mass star formation (Herbig, Vrba and Rydgren (1986)), having no luminous O-B associations within or near to the cloud complex. Once field stars, galaxies and planetary nebulae had been removed from the sample only the molecular cloud "cores", T Tauri stars and a few emission-line A and B stars remained. The great majority of these objects are pre-main sequence in nature and, as stated by Chester (1985), main sequence stars without excess far-infrared emission would only be seen in Taurus if their spectral types were earlier than about A5 and then not beyond 25 microns.

By choosing our sample in this way we are naturally selecting the hotter and thus more evolved sources. To counteract this, the molecular cloud core-criterion was applied to sources with good or moderate quality fluxes at 25, 60 and 100 microns, increasing the "core" sample by about one third. The candidate protostar B335 (Gee et al. (1985)) is only detected by IRAS at 60 and 100 microns while Taurus is heavily contaminated by "cirrus" at 100 microns (see IRAS Explanatory Supplement). This means that detection at 25 microns is also required with those at 60 and 100 microns to avoid confusing a ridge of cirrus with a "genuine" protostar.

The far-infrared luminosity function of these sources is then calculated and converted to the visual band by a standard method (Mamon and Soneira (1982)) to compare with the field star luminosity function of

Miller and Scalo (1979) (noting that the field star luminosity function is defined for all stars, including giants).

The eventual aim of this work is to obtain the far-infrared luminosity functions for a number of molecular clouds which are known to be forming low-mass stars and to investigate how the slope is affected by changes in the density and turbulence of material.

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