Questions and Answers

The Formation of Stars and Planetary Systems, 2010, September 6-9, Särö, Sweden

Section & Talk by H. Linz

Name/Question G. Sandell

IRCDs have been claimed to be sites of high-mass star formation. Yet most IRCD cores are relatively low mass. Do you find any truely high-mass cores ($\geq 1000 M_\odot$) in your sample?

Name/Answer Hendrik Linz

On a clump scale (1-3 pc) the IRDCs of our sample attain masses of 200 - 2000 Mo. This is estimated by using Ossenkopf & Henning 94 opacities for mm emission data, and Weingartner & Draine 2001 ($R_V = 5.5$) extinction cross sections for 8 µm extinction data. I.e., these are quite conservative mass estimates, and the use of Draine & Lee 84 ISM grains would push the masses up by a factor of 2-4.
We do not have single cores (0.2 pc scale), that would have masses of >1000 Mo. However, the final IMF is probably assembled on the clump scale. So, there is still the chance that high-mass stars form easily in these IRDCs, although they will not form an equivalent of, say, NGC 3603.
Still, other properties (degree of turbulence, derived column densities) suggest that IRDCs are distinct from low-mass prestellar cores and are not just distant Taurus-like clouds (Vasyunina et al. 2009).

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Section & Talk by H. Linz

Name/Question G. Olofsson

The transition wavelength from absorption to emission depends on the brightness of the background emission which is strongly variable. How do you handle this problem?

Name/Answer Hendrik Linz

This is of course true. One has to be careful in over-interpreting the shifts of the transition wavelength. In particular, for the IRDC in question, the data have been taken just two weeks ago, and there has been no analysis yet on the systematics of the background levels in comparison to other IRDCs. Currently, this transition wavelength is merely taken as an empirical outcome of the observation, which I wanted to describe. For deriving physical parameters like column densities from 70 μm extinction features, however, we will need a much more thorough assessment of the background levels, and what the whole data reduction process has done to them. Further modelling on IRDC 316.72 will show, if the elevated temperature found from NH_3 can explain the multi-wavelength appearance,

as we see it from 70 µm – 1.2 mm.

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Section & Talk by Session 1, Hendrik Linz

Name/Question Matthijs van der Wiel

What is the coldest IRDC you have seen in your sample, in terms of at what wavelength it transitions from absorption (mid-IR) to emission (far-IR).

Name/Answer

Have not seen any that are still in absorption at 160 μm. In general, translation from observed intensities into column densities is difficult with a relatively warm dish.