POSTER

ABSTRACT

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Theoretical Models of the Formation of the Dense Core Mass Function Compared to Observational Constraints from Herschel and ALMA

The formation and evolution of dense cores in molecular clouds is of high interest, as the mass distribution of the cores appears to be similar to the stellar Initial Mass Function (IMF). We will discuss a new model for the formation of the Dense Core Mass Function (DCMF). Unlike the usual formation mechanisms, which are based on (turbulent) fragmentation, we consider a bottom-up scenario, in which the DCMF is formed by merging of small, but stable, initial seed cores. Our results are in good correspondence with observations of the DCMF of the Pipe Nebula or recent CMFs determinations based on the Herschel Goud Belt Survey.

Future ALMA observations will yield important additional information, since they will allow to directly measure the velocity dispersion in individual cores, even for rather distant star forming regions. Virial analysis can then provide cruical information about the important issue of core stability and the role of surface pressure and self-gravity for the evolution of the cores. This will yield important insight into environmental effects, such as the feedback from nearby hot and luminous stars in massive star forming regions. Since all regions with high levels of massive star feedback are located at relatively large distances, only ALMA will be able to provide spatially resolved information about their core structure and kinematics.