STUDY OF THE FRACTAL DIMENSIONS IN THE MOLECULAR CLOUD ROSETTE BY USE OF DENDROGRAM ANALYSIS

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The observed hierarchy of embedded condensations in star-forming regions (filaments, clumps and cores) hints at their underlying fractal structure. The latter can be traced in terms of the fractal dimension defined usually as D=log N / log L where N is the number of fragments at given level and L is the scaling factor to the upper level (Elmegreen 1997). Such approach requires a clump-extraction technique. An alternative approach is to explore the exponent γ of the mass-size relationship $M \sim L^{\gamma}$ where the scales L are defined in an abstract way (Beattie et al. 2019). We use the clump extraction technique DENDROGRAM (Rosolowsky et al. 2008) to extract the hierarchy of embedded substructures from ^{12}CO/^{13}CO and *Herschel* maps of the molecular cloud Rosette. We obtain the distributions of fractal dimensions for various sets of input parameters of the method and explore the correlation between the mean fractal dimension of the sample and exponent of the mass-size relationship as derived by different approaches.

References

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