Using Spinning Dust Emission To Constrain The Abundance Of Small Dust Grains In Dense Cores

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Within many molecular clouds in our Galaxy there are cold, dense cores in which stars form. These dense environments represent a crucial step in the life cycle of dust and provide a great location in which to study dust grain evolution. However, the size distribution of dust grains in these environments is still the subject of much debate. In this analysis we constrain the abundance of small dust grains in a sample of dense cores using cm observations of spinning dust emission. If small dust grains are present in these cores, then even though stellar photons cannot penetrate deep enough to excite them to emit at mid-IR wavelengths, the small dust grains will be spun-up by collisions and emit spinning dust radiation. Therefore spinning dust emission can be used as a direct probe of the small dust grains in these cores. With this in mind, we present the first attempt to observe spinning dust emission in molecular cores and use it to constrain the abundance of the small dust grains, and hence help to determine the evolution of dust within these dense environments.