# Evolution of the dust properties in a translucent cloud.

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The balloon borne experiment SPM-PRONAOS has measured the submillimeter emission from 200 to 600 μm with an angular resolution of 2-3.5' of a quiescent translucent filament ($A_V$~4) in the Taurus molecular complex. We show, from the combination of these new data with IRAS data, that (1) transiently heated small particles are not present inside the filament, and (2) the temperature of large grain in thermal equilibrium with the radiation field significantly decrease from the outer to the inner parts of the filament.

We have developed a model for the emission of the filament using an independent tracer of the total column density (from the 2MASS star catalog, Cambresy et al.1999) and the radiative transfer code developed by Le Peintre et al.~(2000). We first use the optical properties of the dust from the standard model of Désert et al.~(1990). The computed brightness profile fails to reproduce the data inside the filament. The agreement between data and model can only be found by removing all particles not in thermal equilibrium from the densest part of the filament (typically $n=\sim 10^4 \sim cm^{-3}$), and multiplying the submillimeter emissivity by a significant factor. This suggests that grain-grain coagulation into fluffy aggregates has occured.

These results highlight the promising impacts of PACS and SPIRE on the understanding of the evolution of interstellar dust particles in the diffuse parts of our galaxy.