First maps of comet Hale-Bopp in the Far Infrared

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First maps of a comet at 60 and 175μm were obtained using ISOPHOT, the photometer of the Infrared Space Observatory(ISO). The observations were carried out on December 30, 1997 , mapping an area of 9'×9' centered on comet Hale-Bopp at both filters. Each measurement consisted of 3 individual submaps offset by a third of a pixel in both directions to increase the final resolution of the maps. The final maps were composed of the submaps with the use of a drizzle algorithm. Within the same orbit 3-175μm filter photometry on comet Hale-Bopp was performed as well as multi-aperture photometry near the peak wavelength of the thermal emission. The same photometric sequence was repeated as 'shadow observation' at the same position as that tracked in the initial sequence for precise background subtraction. Quasi-simultaneous observations in the near-IR were obtained with the 3.6m at La Silla/Chile.

From the 60 and 175μm, radial intensity profiles have been derived which are compared to the ones obtained from the near-IR data and to the results of multi-aperture photometry. Since dust grains have the highest thermal emitting efficiency closest to their own size, the emission in the maps observed with the two filters are dominated by the the thermal emission of different size grains. Grain size distribution modeling has been carried out for the spectral energy distribution derived with multi-filter photometry to get an indication of the coma composition which will in turn be used as input for dynamical modelling. First results will be presented.