Comparison between results of thermal evolution model of Tempel 1, Deep Impact target, and observations.

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We report on progress in the comparison between observations of comet Tempel 1 and results from one-dimensional algorithm to model heat and gas diffusion in porous comet nuclei. The comet nucleus is composed by water, volatiles ices and dust in different proportions. The refractory component is made by grains that are embedded in the icy matrix. The code is able to account for the dust release, contributing to the dust flux, and the formation of dust mantles on the comet surface The algorithm has been applied to comet nuclei with characteristics of Tempel 1 assuming different compositions. These models include investigations of the effects of the presence of different volatile ices, of amorphous versus crystalline water ice, trapped gases versus frozen gases, and development and removal of a dust mantle. The comet gas flux, dust flux, differentiation and thermal behavior was simulated and reproduced. The model results are in good agreement with the Deep Impact results and the ground based observations, in terms of activity, dust coverage and temperatures of the surface.