



## **Spectroscopic effects of dimensional contamination on particulate materials**

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Our knowledge of the Martian surface has been greatly increased by means of the data collected by the orbiting spectrometers TES (Thermal Emission Spectrometer), OMEGA (Observatoire pour la Minéralogie, l'Eau, les Glaces et l'Activité) and PFS (Planet Fourier Spectrometer) on board of recent NASA and ESA missions. For a full understanding of those data it is important to determine the typical grain size of the surface regolith and how the presence of multiple populations of grains, with different dimensions, could influence the observed spectra. In this work we present the results of our spectroscopic study based on a thorough laboratory investigation. In particular, we show the effects of a “dimensional contamination”, i.e. the presence in the same sample of two populations of grains with well separated dimension ranges. The effect is analyzed for different size classes of quartz ( $SiO_2$ ) grains, chosen in the range representative of the dimension of the surface regolith. For each class we compare the spectra of grain covered by a tiny dust of quartz with those of accurately cleaned grains. The results show that the contamination effect is more evident for the reststrahlen bands, where the behaviors of the two components are quite different. Therefore the “decontamination” of the samples could be important possibly not only for remote sensing applications, but also in other fields, such as the derivation of optical constants.