



## **Reflectance spectra of particulate mixtures in the near and medium infra-red spectral range: part II**

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The spectroscopic study of mixtures of particulate minerals is extremely important for a correct understanding of the remote sensing measurements of planetary surfaces. In fact the collected spectra depend crucially on a rather high number of parameters, some of which (grain size, grain shape, grain orientation, compactness of the regolith, etc.) might deeply affect the appearance of the recorded spectrum. In addition, since it is rather improbable finding a planetary regolith composed of a single mineral, the relative abundance of each component of the mixture is a further parameter, increasing considerably the complexity of the problem, since it combines with most of the above mentioned parameters. Obviously such a complicated issue cannot be tackled without an adequate theoretical framework and the heavy use of laboratory spectroscopy, in order to monitor the spectral changes under controlled conditions.

In the Astrophysics Laboratory of the University of Salento, we have been working on the subject of mixtures of particulate mineral of planetological interest for a long time now, focusing our efforts on the problem of a correct theoretical reproduction of the measured spectra in the mid-infrared range (MIR: 2.5 – 25.0  $\mu\text{m}$ ). In fact in the literature the comparison between measured and computed spectra of grain mixtures has been studied only in the visible and near-infrared (VNIR: 0.4 – 2.5  $\mu\text{m}$ ), leading to quite satisfactory results.

A full account of the problems we found and the results we obtained is given in a companion paper (Montanaro et al., this conference). Here we shall report on the final part of our study, discussing in detail the role that an additional variable, the physical structure of the mixture, may have in the correct evaluation and representation of the conditions in which the spectra are recorded. In fact, it is well known that mixtures of particulate minerals can be either aerial or intimate, but a clear understanding of the limits, within which a given mixture can be considered as aerial or intimate has never been discussed before. We show that the same mixture of two particulate minerals can be considered and computed in one way or the other, according to the spectral region involved and to the grain size of the components of the mixture.