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Studying the Martian aerosols UV properties with SPICAM

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Aerosols on Mars have an important impact on the radiative transfer properties of its atmosphere. Today their spectral properties and therefore their interaction with UV radiation are only poorly known. Improving the radiative transfer modeling requires a better knowledge of their characteristics, in particular of their phase function, single scattering albedo and opacity.

We have developed a new retrieval algorithm based on the use of the radiative transfer code LIDORT [1], which allows us to simulate the scattering effects of the dust and clouds. The retrieval code, based on the optimal estimation method [2], allows, for the moment, determination of the O3 column, of the albedo of the surface (one constant value over the whole spectral interval), and of the opacity due to the dust (with fixed spectral parameters). In the near future, this code will be adapted in order to take into account the wavelength dependency of all the parameters. Finally, these parameters will also be fitted. We will show how these simulations/methods will improve the knowledge of the aerosol's scattering phase function and single scattering albedo, as well as their opacity as a function of wavelength.

We will present preliminary sensitivity studies of the impact of the different parameters investigated using the data of the SPICAM instrument on board MARS-EXPRESS, both in Nadir and EPS (Emission Phase Function) viewing modes.

References

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