Optical, chemical and µ-physical aerosol properties from laboratory study to IASI measurements: application to volcanic ash and desert dust.

H. Herbin [(1)], P. Alalam [(2,3)], A. Deguine[(4)], and D. Petitprez[(5)]

[(1)]*Univ. Lille, CNRS, UMR8518* - **LOA** – *Laboratoire d'Optique Atmosphérique, F-59000 Lille, France.*

EMail: herve.herbin@univ-lille.fr

[(2)]**LISA**, *UMR CNRS 7583, Université Paris-Est-Créteil, Université de Paris, Institut Pierre Simon Laplace (IPSL), Créteil, France*

[(3)]**CNES** – Centre National d'Etudes Spatiales, 75001, Paris, France

[(4)]**LPCA**, *Université du Littoral Côte d'Opale, 189A, Avenue Maurice Schumann, 59140, Dunkerque, France*

[(5)]*Univ. Lille, CNRS, UMR 8522* - **PC2A** - *Physicochimie des Processus de Combustion et de l'Atmosphère, F-59000 Lille, France.*

ABSTRACT

Recent works showed the potential of using hyperspectral infrared spectrometers, especially IASI, to detect and quantify aerosols from spatial remote sensing. However, in order to fully exploit IASI's spectra, a perfect knowledge of complex refractive index (CRI) of particles in suspension is required.

In that purpose, we present how the aerosol characterization based on laboratory measurements allow to get access to CRI and therefore to establish the link between the aerosol optical properties, their chemical composition and their µ-physical parameters

We will first see how these new dataset are able to fit IASI observations of atmospheric mineral particles, which opens the way for studies of the spatial and temporal variability of mineralogy from space.

Then, we will show the impact of the choice of optical properties on the physical parameters (effective radius and concentration) retrievals in the case of intense volcanic eruptions and desert dust storms.

Finally, we will address the prospect of extending these studies to other types of aerosols such as biomass burning particles, as well as exploiting the spectral synergy combining far infrared and thermal infrared spectral ranges thanks to the future IASI-NG and FORUM missions.