



Validation and retrieval of IASI measurements with IASI-balloon correlative measurements

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Because of the increase of anthropogenic greenhouse gases and pollutants in the atmosphere since pre-industrial times and their impact on the environment (ozone hole, air quality, acid rains, greenhouse effect), in situ and remote-sensing measurements of atmospheric composition are carried out by a wide variety of instruments, using different measurement principles and different platforms (ground, aircrafts, balloons, satellites). The IASI (Infrared Atmospheric Sounding Interferometer) instrument, consisting of a nadir-looking thermal infrared Fourier transform spectrometer, which was launched onboard the MetOp-A platform on 19th October 2006, is dedicated to operational meteorology. However, IASI spectra have demonstrated a huge potential for retrieving trace gases such as ozone (O₃), methane (CH₄), carbon monoxide (CO) and many others.

In this framework the LPMAA (Laboratoire de Physique Moléculaire pour l'Atmosphère et l'Astrophysique) developed a balloon-borne Fourier transform infrared (FTIR) spectrometer called IASI-balloon to record high resolution (0.1 cm⁻¹ apodised) spectra of the atmosphere / surface system in the nadir looking geometry. Several flight of this balloon experiments have been performed allowing to provided a large number of thermal emission nadir looking FTIR spectra in the 650 – 3000 cm⁻¹ region, recorded from float at about 35 km altitude. We retrieved profiles and/or columns of H₂O, CO₂, O₃, N₂O, CO and CH₄. For a flight performed from Teresina, Brazil, the spectra recorded during the balloon flight are in good coincidence with IASI-MetOp measurements. We used this set of data to test the impact on the retrieval of a new cloud simulation module in our retrieval algorithm LARA (LPMA retrieval Atmospheric Algorithm). The results will be presented here.