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## Application of $\Phi$ -IASI to IASI: retrieval products evaluation and radiative transfer consistency

**G. Masiello<sup>1</sup>, C. Serio<sup>1</sup>, A. Carissimo<sup>1</sup>, G. Grieco<sup>1</sup>, and M. Matricardi<sup>2</sup>**<sup>1</sup>Dipartimento di Ingegneria e Fisica dell'Ambiente, University of Basilicata, 85100 Potenza, Italy<sup>2</sup>European Centre for Medium-Range Weather Forecasts (ECMWF), Shinfield Park, Reading, Berkshire, RG2 9AX, UK

**Abstract.** Retrieval products for temperature, water vapour and ozone have been obtained from spectral radiances measured by the Infrared Atmospheric Sounding Interferometer flying onboard the first European Meteorological Operational satellite. These products have been used to check the consistency of the forward model and its accuracy and the expected retrieval performance. The study has been carried out using a research-oriented forward-inverse methodology, called  $\Phi$ -IASI, that the authors have specifically developed for the new sounding interferometer. The performance of the forward-inversion strategy has been assessed by comparing the retrieved profiles to profiles of temperature, water vapour and ozone obtained by co-locating in space and time profiles from radiosonde observations and from the European Centre for Medium-Range Weather Forecasts analysis. Spectral residuals have also been computed and analyzed to assess the quality of the forward model. Two versions of the high-resolution transmission molecular absorption database have been used, which mostly differ for ozone absorption line parameters, line and continuum absorption of both CO<sub>2</sub> and H<sub>2</sub>O molecules. Their performance has been assessed by inter-comparing the results, and a consistent improvement in the spectral residual has been found when using the most updated release.

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