

Ozone profiles from EUMETSATs current and future hyperspectral sounding missions.

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ABSTRACT

Global measurements of ozone profiles derived from the hyperspectral Infrared Atmospheric Sounding Interferometer (IASI) are part of the EUMETSAT operational IASI Level 2 products disseminated in near-real time. They provide important information about the variability of tropospheric and stratospheric ozone for different applications since 2007, the start of Metop-A.

EUMETSAT uses an evolution of the Piece-Wise Linear Regression (PWLR) algorithm to provide an ‘all-sky’ sounding of ozone profiles by exploiting hyperspectral infra-red measurements from IASI in synergy with collocated microwave data from the AMSU and MHS companion instruments onboard EPS/Metop by simultaneously meeting the timeliness requirements for regional applications. Those products are of importance to derive the 3D wind fields as an example.

The method, aka PWLR³, has been reprocessed to create a climate data record (CDR) for Metop-A and Metop-B and an evolution of it will be applied to the next generation of EUMETSAT hyperspectral sounder instruments IASI-NG on Metop-SG polar missions and the new InfraRed Sounder (IRS) on the MeteoSat Third Generation (MTG) geostationary missions. These will offer unparalleled data on atmospheric chemistry parameters with high vertical and horizontal resolution for IASI-NG, as well as high temporal sampling of 30 minutes over Europe for IRS.

We present here an overview of EUMETSAT’s global all-sky ozone profile products that will be used for 3D wind field applications together with the results of a long-term validation study of EUMETSAT’s IASI L2 ozone products against measurements from in-situ ozone-sondes.