4–8 November 2019, Kraków, Poland
ECSS2019-197
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Evaluating the use of temperature and humidity profiles from the IASI hyperspectral sounder for severe storm forecasting at the ESSL Testbed

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As part of the Meteosat Third Generation (MTG) mission, EUMETSAT will employ two geostationary sounding satellites (MTG-S) each carrying an Infrared Sounder (IRS) instrument. The IRS allows tropospheric temperature and humidity to be analysed with an unprecedented spatial and temporal resolution. Severe convective storms are strongly controlled by the stability and moisture distribution in the troposphere. Therefore, it is expected that these new data will aid the forecasting of such weather systems, both by assimilating the data into Numerical Weather Prediction (NWP) models, and by the direct use of the retrieved profiles by forecasters.

Today, similar sounder data is already available from the Infrared Atmospheric Sounding Interferometer (IASI) instrument on the polar-orbiting Metop satellites. The EUMETSAT Advanced Retransmission Service EARS-IASI was recently extended to include regional Level 2 products providing sounding profiles for regional applications. These products are available to forecasters within 30 minutes from sensing. At the ESSL Testbed 2019, the use of IASI-retrieved temperature and humidity profiles for storm forecasting have been evaluated as part of a study procured by EUMETSAT. At the Testbed, forecasters of European weather services, researchers and the ESSL team jointly use experimental products to make convective forecasts.

To allow the comparison between IASI observations and NWP data, the Testbed data platform was extended to display parameters relevant to convective storm prediction such as CAPE, CIN and humidity at various levels. Moreover, a direct visual comparison between the satellite-derived and NWP-modelled profiles of temperature and humidity was made possible. In our presentation, we will look back to the evaluation and demonstrate the visualizations of the data that were developed. We will present the preliminary findings and discuss the potential ofdirect use of IRS-based profiles for forecasting severe convection, based on the experience of Testbed participants.