

Improving weather forecasting with a new IASI channel selection method

September 27 2017

Advances in Atmospheric Sciences

Volume 34 Number 11 November 2017



C N C
I A M A S



 **I A M A S**
International Association of Meteorology
and Atmospheric Sciences



Springer

Credit: Advances in Atmospheric Sciences

With the advent of satellite observation techniques and improvements in data assimilation schemes, the initial state in a numerical weather prediction (NWP) model is increasingly realistic. This is fast becoming the most vital part of the process. Furthermore, among the many available satellite observations, infrared hyperspectral measurements are known to have the greatest impact on weather forecasting.

In a new study published in *Advances in Atmospheric Sciences*, researchers attempted to select hyperspectral sounder infrared atmospheric sounding interferometer (IASI) channels from the 314 channels provided by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) for data assimilation in the U.K. Met Office Unified Model using a one-dimensional variational analysis . The [channel](#) selection was performed by considering the degree of improvement in retrieved atmospheric parameters from 1D-Var over the background atmospheric parameters, using the Channel Score Index as a measure of success. In the Unified Model, IASI measurements have been assimilated since 183 channels were subjectively selected in 2007.

Instead of the currently used 183 channels, 200 newly selected IASI channels, including substantially different H₂O and shortwave infrared channels, were used for the UM data assimilation. From the two trial runs using the UKMO UM [data assimilation](#) system, it was noted that the new IASI channels gave an overall neutral impact in terms of the NWP index based on parameters such as 500-hPa geopotential. However, experiments resulted in a significant bias reduction in the relative humidity forecasts, in particular over the upper-troposphere layer from 500 hPa to 200 hPa, which was attributed to additional H₂O channels in

the new IASI channels.

More information: Young-Chan Noh et al, A new Infrared Atmospheric Sounding Interferometer channel selection and assessment of its impact on Met Office NWP forecasts, *Advances in Atmospheric Sciences* (2017). [DOI: 10.1007/s00376-017-6299-8](https://doi.org/10.1007/s00376-017-6299-8)

Provided by Chinese Academy of Sciences

Citation: Improving weather forecasting with a new IASI channel selection method (2017, September 27) retrieved 25 April 2024 from <https://phys.org/news/2017-09-weather-iasi-channel-method.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.