

## **The spectral calibration algorithm convergence anomaly on IASI-B and IASI-C: analysis and relation to geophysical events**

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### **ABSTRACT**

The IASI spectral calibration is performed by matching the spectral lines of the acquired L0 spectra to those of reference spectra within the stratospheric CO<sub>2</sub> window situated between 2340-2380cm<sup>-1</sup>. In 2022 the IASI Technical Expertise Center observed that for both instruments currently in orbit, the iterative spectral calibration algorithm fails to converge in more cases than usual. Although the robustness of the IASI algorithm chain insures that the instrument performances are unaffected, a study was launched to investigate the origins of the anomaly.

The analysis of the quality flags linked to the convergence of the spectral calibration algorithm shows a perfect synchronization between IASI-B and IASI-C, as well as a seasonal dependence of the intensity of the phenomenon. By geolocating the non-convergence flag it is possible to locate the anomaly close to the North Pole from October to April and close to the South Pole for the rest of the year.

The above results point to a geophysical origin of the anomaly, with possible causes currently under investigation. A strong correlation to the polar vortex temperature (especially concerning the North Pole) can be established by comparing to the mean stratospheric temperatures. At the same time there also seems to exist a possible link to the eruption of the Hunga-Tonga Haa'pai volcano, which took place only a few days prior to the first signs of the anomaly and whose lasting effect on the stratosphere could have triggered the algorithm convergence anomaly.