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On the fingerprint of ssw events in infrasound recordings at IMS stations

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It has been recently shown that sudden stratospheric warming (ssw) events have an impact on the detection of coherent infrasonic waves at dedicated arrays (e.g., Evers & Siegmund, 2009). During ssw events the polar vortex of prevailing stratospheric westerly winds in a winter hemisphere abruptly slows down or even reverses its direction along with an increase of stratospheric temperatures up to several tens of °C. Since infrasound arrays are mostly recording signals ducted in stratospheric wave-guides, such antennas are sensitive to changes in effective sound speed profiles – temperature plus wind speed in direction of propagation. Considering continuous infrasonic waves emitted by ocean swell (microbaroms), volcanoes or even anthropogenic sources as flares, a gap or a change in the back-azimuth of these detected signals can be observed at arrays.
For the compliances with the verification of the Comprehensive Nuclear-Test-Ban Treaty a global network of 60 infrasound stations is under construction as a part of the International Monitoring System (IMS); whereas 45 have already been installed. Analysis of waveform data recorded at these stations has demonstrated the capability of infrasound as a supplementary tool for remote sensing of the atmosphere. In our study we compare the re-analysis, using PMCC, of more than five years of continuous data at all available sites (see Matoza et al., 2013) with atmospheric descriptions provided by the EMCWF. We present a synoptic view of the fingerprint of ssw events in detection of coherent signals at IMS infrasound stations both on northern and southern hemisphere, covering the full latitude range from Antarctica to Greenland.