



Microbarom signals recorded in Antarctica - A measure for sudden stratospheric warming?

L. Ceranna(1), A. Le Pichon(2) and B. Blanc(2)

(1) BGR, Hannover, Germany (2) CEA/DASE, Bruyeres-le-Chatel, France

Germany is operating one of the four Antarctic infrasound stations to fulfill the compliance with the Comprehensive Nuclear-Test-Ban Treaty (CTBT). I27DE is a nine element array which in continuous operation since its deployment in January 2003. Using the PMCC detection algorithm coherent signals are observed in the frequency range from 0.0002 to 4.0 Hz covering a large variety of infrasound sources such as low frequent mountain-associated wave or high frequency ice-quakes. The most prominent signals are related microbaroms (mb) generated by the strong peri-Antarctic ocean swells. These continuous signals with a dominant period of 5 s show a clear trend in the direction of their detection. This trend is well correlated to the prevailing stratospheric wind direction and speed. Although harsh weather conditions have often been faced at the station the infrasound array is capable to detect mb-signals up to wind speeds of 15 m/s. Therefore, I27DE is 85 % of the time operational.

For mb-signals a strong increase in trace velocity along with a decrease in the number of detections were observed during the Austral summer 2006 indicating strong variations in the stratospheric duct. However, wind and temperature profiles at the station give no evidence for such anomaly. Nevertheless, strong events of sudden stratospheric warming (SSW) at latitude ranges of the peri-Antarctic belt occurring during Austral winter 2006 provide a potential explanation for the abnormal sound propagation. This will be demonstrated computing 2-D numerical simulations for sound propagation using ECMWF profiles along the path from the ocean swell to I27DE.