Geophysical Research Abstracts, Vol. 7, 03081, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03081

Mechanical sensitivity of microbarometers and correlation between the seismic and infrasound signals

Yu. Starovoit, P. Martysevich

International Monitoring System Division (IMS), Comprehensive Nuclear Test-ban-Treaty Organization (CTBTO), Wagramerstarasse 5, A-1400, Vienna, Austria.

yuri.starovoit@ctbto.org, pavel.martysevich@ctbto.org / Fax +43-1 26030 5921

Mechanical sensitivity of two pressure sensors MB2000 and Chaparral5, widely used in the International Monitoring System (IMS) infrasound network, has been examined using shake table. Both sensors appeared to be sensitive to mechanical vibration with different level and shape of mechanical response. Mechanical sensitivity of both sensors to ground motion allows to estimate the level of acceleration amplitudes generated by different size earthquakes or explosions, which can potentially induce the output signal from microbarometer above the acoustic background. The work results contain the graph of expected microbarometer signal-to-noise ratios for different earthquake magnitudes and epicentral distances.

Further discussion shows two possible mechanisms of correlation between pressure and seismic signals in the output of co-located micropressure and seismic sensors based on the analysis of the real events. One mechanism is the mechanical sensitivity of MB2000 microbarometer as mentioned above, and another one suggests an excitation of pressure oscillation in the surface level of the lower atmosphere by the vertical ground motion (“piston” effect) above the detection threshold of MB2000. As the conclusion it was assumed that in the frequency band $f<1.5$ Hz “piston” effect has the main contribution, whereas for $f>1.5$ Hz prevails mechanical sensitivity of MB2000. The data analysis has been based on the simultaneous observations at several co-located infrasound and seismic IMS stations for Altay earthquake on 27 September 2003, Indonesian earthquake on 10 October 2002 and recent disruptive earthquake in Sumatra region on 26 December 2004.