



Microbarograph measurements in the Czech Republic. Seasonal and diurnal variability of pressure fluctuations in the infrasound frequency range

Tereza Sindelarova, Michal Kozubek, and Peter Krizan

Institute of Atmospheric Physics ASCR, Prague 4, Czech Republic (tersin@ufa.cas.cz)

Microbarographs enable observations of small scale pressure fluctuations and thus are a suitable instrument for monitoring of atmospheric infrasound. Infrasound propagation is influenced by conditions in the surrounding atmosphere. Principal factors that determine refraction and absorption of the signal are temperature and wind field, atmospheric density, humidity, and chemical composition.

Microbarograph measurements are performed in three locations in the Czech Republic – in Panska Ves (50°32'N 14°34'E), Novy Kostel (50°14'N 12°27'E), and Pruhonice (49°59'N 14°32'E). Reference levels of signal amplitudes were estimated for each month of the year and at four terms of the day at 03:00, 09:00, 15:00, and 21:00 UT (UT=LT-1). Significant seasonal trend was observed particularly in the frequency range 0.1-0.3 Hz. Spectral peak occurred at these frequencies in winter (December-January); it was less obvious in spring and autumn and completely disappeared in summer (July). It is widely accepted that this frequency range is dominated by microbaroms - signals generated by motion of sea surface. The seasonality of microbaroms is determined mainly by the seasonality of its source and by seasonal changes of stratospheric winds that influence infrasound propagation.

The diurnal variability was evident particularly in summer months (June – August) with maximum amplitudes during the daytime (09:00 UT and 15:00 UT) and minima at night (03:00 UT and 21:00 UT). In winter, the diurnal regime was less distinct. Summer diurnal variability is influenced by turbulence in the atmospheric boundary layer caused by strong convection. In winter, airflow is determined rather by the pressure gradient over the region and daily course of the wind speed is very weak.