



Infrasound radiated by an earthquake into the atmosphere – epicentral observations

Jan Laštovicka (1), Jaroslav Chum (1), Tereza Šindelářová (1), and Josef Horálek (2)

(1) Institute of Atmospheric Physics ASCR, Prague, Czech Republic (jla@ufa.cas.cz, +420 2 7276 2548), (2) Institute of Atmospheric Physics ASCR, Prague, Czech Republic

In autumn 2008, a swarm of weak earthquakes ($M < 4$) occurred in the westernmost part of the Czech Republic. The epicenter of event observed on 28 October 2008 (50.212°N, 12.454°E; time 08:30 UT, depth 7870 m) was located almost in the place where a microbarograph was installed (distance 2.3 km), another microbarograph was installed nearby, and the third microbarograph was installed at a distance of 155 km. All were located at heights around 400 m a.s.l. An ionospheric Doppler measuring path was located in the earthquake area, as well. This is for the first time that microbarograph measured atmospheric infrasound in the epicenter area during an earthquake. Both epicentrally-located microbarographs observed seismic excitation of infrasound at frequencies about 1(2)-12 Hz, while there was very little energy both at higher and lower frequencies. The observed infrasound correlated well with the vertical component of seismic motions, while there was almost no correlation with horizontal components. This means that the vertical motion of surface is responsible for excitation of infrasound. The distant station (155 km) observed much weaker infrasonic signal at frequencies of about 2-4 Hz, which was excited in situ by seismic waves, it was not infrasound propagating from the epicentre (among others this station seems to be in infrasonic "shadow" zone). Vibration tests show that the microbarograph equipment is rather insensitive to mechanical shaking at the observed seismically generated frequencies, i.e. the observed oscillations are essentially real infrasound. Ionospheric measurements did not see the earthquake mainly because the seismically excited infrasound was at frequencies too high to penetrate to ionospheric/thermospheric heights (at the moment of observations the Doppler system was sounding at heights near 160 km). More details will be presented in the paper.