

Abstract

The purpose of the bachelor thesis is to compile an overview of the information about sources of seismic energy used in land seismic survey. At the beginning of the thesis, the physical basis of seismic methods is mentioned. Basic types of seismic waves are briefly described and the specific of the spread of seismic waves through the rock environment is mentioned. It is followed by a chapter about the history of land seismic sources, which maps their use approximately since the half of the 19th century till the beginning of the commencement of a method Vibroseis in 1950's and 1960's. The overview of seismic sources is in the chapter called Land seismic sources division. Seismic sources are divided into those, which use chemical explosives and mechanical sources. Mechanical sources are divided into impulsive, vibratory and special sources. The attention is paid to their technical parameters and other properties (for example chemical composition in a case of explosives), which is supplemented by examples of commercial sources. There is also present an experimental part in the thesis. There is tested a faculty electrodynamic vibrator. It enables to generate vibratory signals of any time course. The frequency characteristics of the vibrator was experimentally determined. A faculty seismograph Geode and 10 Hz geophone were used in order to perform the measurements. Seismograms with a duration of 1 second were recorded for harmonic signals of various frequencies in a range 15–400 Hz. A calculation of mean value of the envelope of amplitudes determined using Hilbert transform was performed in order to determine amplitudes of velocity. It was found out, that inverse values of amplitudes of frequency characteristics in the range 50–400 Hz are linearly dependent on frequency. The vibrator was tested with few upswep signals too. There is made a summary at the end of the thesis, which shows, that a good knowledge of possibilities of seismic waves excitation is an important part of realization of seismic measurements with an active source.

Key Words: Seismic Survey, Seismic Energy Source, Seismic Vibrator