

Step table calibration of broadband seismometer Streckeisen STS-2

ZAMG and the Institute of Physics of the Earth (IPE) of the Masaryk University, Brno, Czech Republic has been closely cooperating in the field of seismology since 1992. Within the framework of the Education for Competitiveness Operational Programme a group of IPE geoscientists and technicians visited the Conrad Observatory in October 2011. On this occasion the absolute calibration of the seismometer STS-2 on the calibration table CALTAB_1 was performed by ZAMG technicians. Comparative calibration measurement on Wielandt type step table CT-EW1 (Lennartz product) was performed at the IPE. The difference in the estimation of the generator constant of the seismometer was found to be 1.8% of the nominal value.

Accurate calibration of seismometers is one of the most important and the most difficult tasks in maintaining a seismic network. The absolute calibration is the best method how to determine the exact value of the seismometer generator constant. The Lennartz step calibration table, type CT-EW1, and the step calibration procedure are used in IPE for the absolute seismometer calibration. The CT-EW1 is a portable precision calibration table for short period and broadband seismometers. Its main purpose is to provide a reliable and repeatable single step in displacement. Using the seismometer response produced by table step movement and a suite of software programs, the absolute generator constant of the seismometer can be determined.



Figure 1: Calibration Table CT-EW1 in the Institute of Physics of the Earth, Brno with STS-2 seismometer.

The Conrad Observatory is equipped with the high precision Calibration Table CALTAB_1. During the visit in October 2011 this table was used as a reference instrument for calibration of the STS-2 and estimation of its generator constant.



Figure 2: Calibration Table CALTAB_1 and STS-2 seismometer mounted on it at the Conrad Observatory.

The estimated sensitivity values of the STS-2 were compared to the factory value of 1500 V/m/s. Comparing both results, we observe a greater deviation from the nominal value by the CT-EW1 calibration. It is more than 1%, which is the accuracy of the instrument given by the producer. This difference may be caused by the relatively high seismic noise at the IPE laboratory where the calibration was performed.

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References:

Lennartz electronic GmbH: The CT-EW1 Calibration Table, Document number: 990-0062, Tübingen, 2006.

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