SEISMOMETER CALIBRATION AT OGS

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Abstract

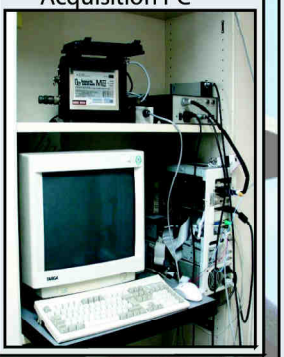
Determination of instrument response is fundamental in order to reconstruct the true earthquake ground motion. To this purpose, the "Centro di Ricerche Sismologiche" (CRS), Department of the Istituto Nazionale di Oceanografia Sperimentale - OGS, has developed a calibration procedure that allows for the determination of accurate response curves in the frequency range 0.03 - 100 Hz.

The system hardware features a shake table, a laser interferometer, a "CRS-made" interface board that allows for A/D conversion between the laser interferometer and the personal computer, an audio board and a M24 Lennartz data logger. The shake table is fixed on a 500 kg reinforced cement base.

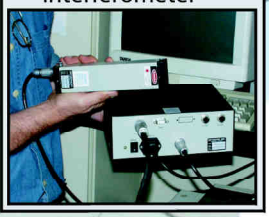
The system software has been written using MatLab. A procedure has been devised to automatically determine the response curves of the sensors after the shake table has been properly driven within the target frequency range. In general, the input, broadband signal, used to drive the shake table, is found to exploit the characteristics of both the shake table and the type of sensor (i.e., velocimeter, accelerometer, frequency response). For short period instruments, we have found that reliable response curves can be estimated in a few minutes whereas longer acquisition times are required for broadband sensors.

The shake table and its components

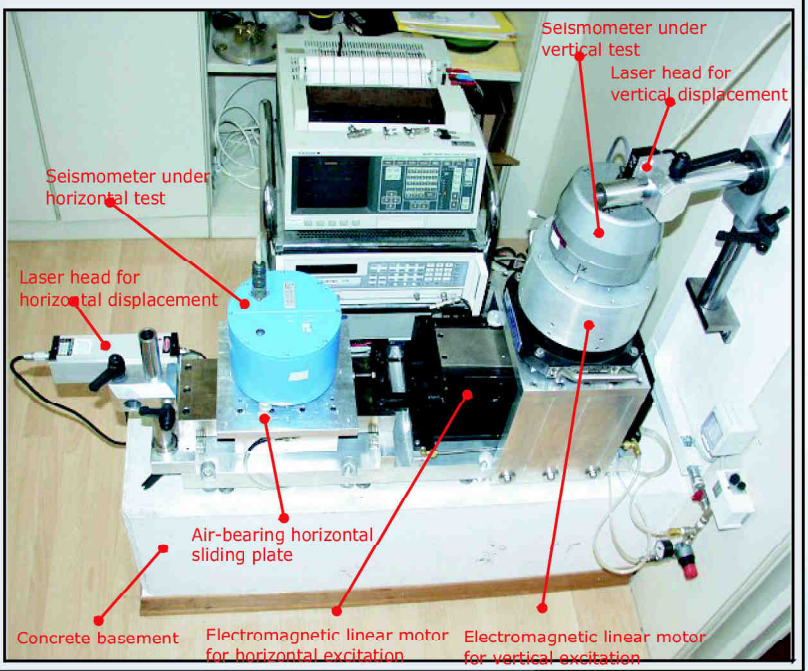
Acquisition PC



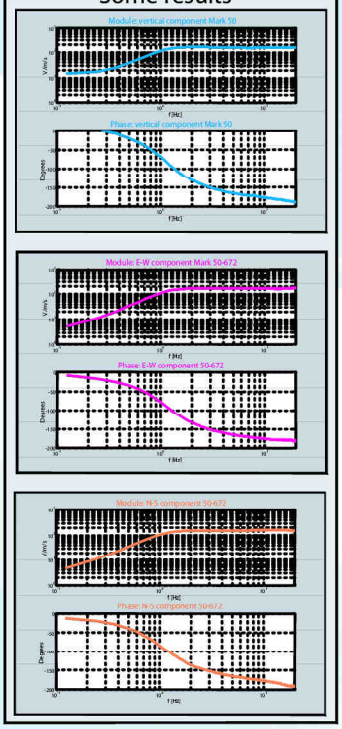
Interferometer



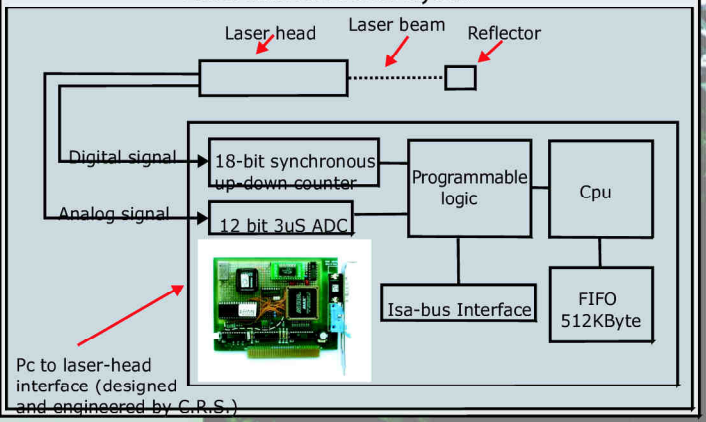
The shake table



Some results



Laser interferometer layout



Excitation, how it works