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Project PIM: a low-cost mobile seismo-acoustic sensor for geophysical deployments

In this work, we present the "Pressure and Initial Measurement" (PIM) measurement board. The goal of project PIM is to develop a low-cost measurement board with multiple seismo-acoustic digital sensor and to compare them with existing high-fidelity equipment. PIM is designed using Micro-electromechanical Systems (MEMS) sensors. The sensors on the measurement board are an absolute pressure sensor, differential pressure sensor and an accelerometer. The board can be placed on top of a Raspberry Pi which serves as a datalogger. Printed circuit boards (PCB) have been designed to connect MEMS to the Raspberry Pi. All components of PIM are cheap, have a low energy consumption and have a small dimension. This allows for a versatile sensor that can be used for geophysical field studies, i.e. as mobile sensor arrays or in areas where the security of a deployed sensor is less guaranteed. Besides introducing a low-cost seismo-acoustic mobile sensor, we present the outcome of several calibration tests. The calibration protocol for PIM is based on the calibration protocol of the Royal Netherlands Meteorological Institute.

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