

Ground motion seismic monitoring by the use of distributed low cost sensors

(Proposer: Dr. Jacopo Boaga)

Modern seismic ground motion sensors have reached excellent response quality in terms of dynamic and bandwidth resolution. The weakest point in seismic wavefield recording still remains the spatial sampling, due to the limited number of sensors installed. A great improvement in spatial resolution can be achieved by the use of low cost distributed sensors arrays, capable of recording seismic events with dense sensors network. In this perspective, Micro-Electro Mechanical System (MEMS) sensors can efficiently integrate the use of common accelerometers for moderate to strong seismic events. Recently moderate to strong earthquakes were collected by prototype sensors arrays worldwide. The potential of such technology is far to be fully explored, both in terms of response hazard analysis and geological prospecting aims. The PhD project will explore the frontier field of these low cost distributed sensors in terms of seismic local response analysis, early-warning uses, hazard evaluation potentials and also the use of passive arrays for subsoil characterization. The PhD candidate will be involved in arrays design, prototype sensors installation, data processing and test of passive seismic prospecting. The PhD project will be developed in strong co-operation with industrial partners responsible of design and construction of sensors, public institute in charge of hazard mitigation and research centers. At the end of the project the candidate is expected to reach evaluable technical and scientific skills in the fields of applied geophysics and engineering. Collaborations and research visits to foreign Universities and partners (TU Wien, Austria - Real Time Seismic, Pau, France) are expected.