SESSION 52- Advanced methods for harnessing seismic noise analysis in applied seismology (ESC/SSA)

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Session Description

There are growing demands for advanced and proven approaches to analyze seismic noise to enhance the imaging and monitoring of shallow geological structures, as well as study and mitigate natural hazards. Such advancements are not only relevant from a scientific perspective but are also essential for practical aseismic applications, including land-use planning and risk mitigation in areas exposed to other environmental hazards. Seismic noise analyses, when combined with both in situ passive and active geophysical methods, provide a reliable and cost-effective tool for subsurface investigations. Recent improvements in this field have been driven by the availability of affordable acquisition systems and enhanced computational capacity for solving inverse problems, as well as developments of sophisticated modeling algorithms. While traditional seismometer-based techniques elucidating advancements in the state of knowledge are welcomed, novel approaches now exploiting large datasets from distributed acoustic sensing, dense nodal arrays, and novel fiber sensing methods (e.g., state of polarization, long-range interferometry) are also known to spur interests. For example, applications of these methods are manifold, ranging from engineering seismology

(site effects, site characterization, liquefaction, and ground-motion amplification at various scales) to high-resolution fault imaging, fracture network characterization in reservoirs, volcanic and geothermal environments, landslide hazard assessment etc. Contributions exploring noise-based methods in aquatic environments are also encouraged.