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On the Definition of realistic Earthquake Parameters along potential active Faults in the French-Italian Riviera: a key step in Quantitative Seismic Hazard Assessment (QSHA) - a Platform for strong Ground Motion Modeling.

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The ANR project QSHA ("Quantitative Seismic Hazard Assessment") aims to provide French seismologists with a platform to test earthquake source and wave propagation models that account for the complexity of the source and the crust, including local detailed stratigraphy, topography and bathymetry. Numerical ground motion estimations taking into account the geological complexity will be considered in three densely populated coastal zones (Naples, Italy; the French-Italian Riviera region and Algerian coast. Numerical results will be confronted with strong ground motion attenuation model predictions and, where possible, with ground motion recordings. A necessary step towards such an objective requires proposing locations and characteristics of potential earthquake sources. It is the purpose of our presentation to explain the methodology that we propose to define realistic earthquake source parameters along potential active faults.

The French-Italian Riviera is located at the junction between the South-western Alps and the Ligurian oceanic Basin. It is one of the most seismically active regions of western Europe: (i) numerous events are recorded each year, and there is an earthquake of

magnitude 4.5-5 roughly every five years, (ii) one instrumental record testifies to a magnitude 6 in 1963 and (iii) swarms of microseismicity highlighting active faults at depth, remind us that active faults are present but that they may not be easily identifiable at the surface. Last but not least, historical seismicity also reveals that large destructive earthquakes have occurred in this region and some of these events, such as the Ligurian earthquake (February 23, 1887), may have reached a magnitude 6.5 or above. Nevertheless, the geological context is particularly difficult and charactering active faulting remains a challenge because of (i) the long term low rate of deformation versus high rate of erosion, (ii) the complex structural heritage and (iii) the poor knowledge of the marine area.

Taking into account the present-day data, we propose a methodology to define 5 hypothetical earthquakes sources representative of the seismic hazard of the Nice and the Ligurian basin northern margin area. The criteria used to select the hypothetical sources include the presence of historical seismicity, microseismic alignments, indication of faults kinematics deduced from instrumental earthquakes, suspected evidence of Plio-Quaternary deformation and/or definition of fault zones with homogenous seismogenic potential as suggested by the most recent regional tectonic studies. Clearly, the earthquake sources located on potential active faults identified thus far are not exhaustive and do not preclude that other faults may be present at other locations and other sources may thus be equally realistic. Such sources will be considered in the future, as new data is gathered and as long as the same criteria apply.