



### **3D hybrid modelling of site effects in Tricarico (Italy)**

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Local 3D site effects due to the topographic sedimentary cover and the geometry of the sub-surface reasonably contribute to possible damages in case of an earthquake in the Tricarico town area (Southern Italy). The town is situated on a calcarenite outcrop, which is underlain by argillaceous material with lower shear wave velocity, a common situation for many towns in this region (e.g. DiGiacomo et al, BSSA, 2005). The respective earthquake hazard is moderate to high according to the Italian official seismic classification (0.25 g for a return period of 475 years). Damage was reported during the 1694, 1857, and 1980 earthquakes. Microtremor measurements and accelerometric monitoring were conducted in the town and the analysis of the data showed several features related to site effects: the level of amplification is increased for certain wavetypes and the amplification level differs on the horizontal components. From geological and geo-engineering information, we constructed a detailed 3D model of the sub-surface underneath the town; including topography. The standard crustal model from INGV was used as layered half space background model, in which wave propagation was computed using the improved propagator matrix algorithm of Wang (BSSA, 1999). 3D FD modelling of the detailed structure was continued using the hybrid algorithm by Oprsal and Zahradnik (JGR, 2002).