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# Probabilistic seismic hazard assessment for the Collalto area (Northern Italy): preliminary results based on natural seismicity observations

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We present preliminary results for a probabilistic seismic hazard assessment (PSHA) for an area centred around Collalto Stoccaggio, a natural gas storage facility in Northern Italy. The Collalto site is located at the outer front of the Venetian Alps fold and thrust belt, 50 km northwest of Venice in a region characterised by medium-high seismic hazard. The storage exploits a depleted natural gas reservoir located within an actively growing anticline, which is likely driven by the Montello Fault, the underlying blind thrust. The proximity of the Collalto site to this structure and other active faults in the region requires a careful consideration of these faults in our study. At this time, no correlation can be identified between the the gas storage activity and local seismicity, so we proceed with a PSHA that considers only natural seismicity, where the rates of earthquakes are assumed to be time-independent.

The source model consists of faults and distributed seismicity to consider earthquakes that cannot be associated to specific structures. For the fault sources, all active faults within 50 km of the site are considered. They are characterised in terms of their geometry and slip rates using geological, geophysical and seismological information. Distributed seismicity is characterised using a homogenised catalogue that incorporates the available historical and instrumental data. Source modelling and hazard calculations are performed using the OpenQuake-engine. We model the fault planes in 3D and investigate the impact on the hazard using ground motions prediction equations (GMPEs) with different rupture-to-site distance metrics. We explore the sensitivity of the hazard results to various parameters affected by epistemic uncertainty (e.g. fault geometry, maximum magnitude, different GMPEs) and propose a logic tree to account for them.