

# Long-living seismogenic faults system in the Valdelsa Basin (southern Tuscany) and their role in controlling the local seismicity

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We describe the seismotectonic setting of a southern Tuscany sector (Valdelsa Basin, Italy) where fault systems, active since Neogene, are generating low-magnitude earthquakes, and where the occurrence of active faults was formerly undocumented. Our study is based on the integration of different datasets and fieldwork analyses: i) reconstruction of the stratigraphic and structural setting of the northern-central portion of the basin through fieldwork; ii) analyses of aerial and satellite images; iii) kinematic analyses on exposed faults; iv) interpretation of reflection seismic profiles and borehole logs acquired for hydrocarbons exploration by AGIP during the 1980's; v) reprocessing of the seismological data set of seismic events recorded by INGV network.

The main results allow us to conclude that the Castelfiorentino and Certaldo earthquakes,  $M=3.9$  (2016-10-25) and  $M=3.4$  (2014-08-09) respectively, and their associated minor shocks, are associated with a NE-trending faults system, orthogonal with respect to the main NW-SE trend of the Valdelsa Basin. We discuss the role of these faults in controlling the earthquakes, their detection by means of subsurface data and possible correlation with geomorphological observations, also framing their evolution in the Neogene-Quaternary tectonic setting of the inner Northern Apennines.

