

EGU21-8433

<https://doi.org/10.5194/egusphere-egu21-8433>

EGU General Assembly 2021

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Sedimentary record and the late - Quaternary tectonics of the “Livorno-Empoli Fault” (Northern Tuscany, Italy)

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The “Livorno-Empoli” fault represents the westernmost segment of one a major transversal structure of the inner Northern Apennines the so-called “Livorno-Sillaro Line” a regional structure described in the literature, for a long time (e.g., Ghelardoni, 1967; Bortolotti, 1966; Bernini et al., 1991; Cantini et al., 2001; Pascucci et al., 2007; Rosenbaum, Agostinetti, 2015). In the frame of our ongoing studies, in this contribution, we will focus on the short term history of this regional fault. A new stratigraphic-sequence frame for the late-Quaternary deposits has been developed by using the different facies associations as defined through a large surface database analysis. Moreover, a correlation has been done between subsoil deposits and the outcropping sediments on the hilly areas (Livorno, Pisa, and Cerbaie hills) surrounding the Arno valley.

Additionally, a morphotectonic analysis of the hydrographic networks and relief distribution has been done the Lidar data (DTM), supplied by the Tuscany Region, at the 2 m and 10 m of resolution. Specifically, the river system is particularly sensitive to deformation processes. The fluvial streams are in fact characterized by low geomorphological inertia and, therefore, by response times of a few hundred thousand years to the tectonic processes ongoing.

As a result of the integrated multidisciplinary analysis, it was possible to highlight the evidence of middle Pleistocene-Holocene tectonics of the “Livorno-Empoli Fault” until now neglected by the literature.

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