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PALEOSEISMOLOGICAL INVESTIGATIONS AT THE FRONT OF THE EASTERN SOUTHERN ALPS (NE Italy)

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In the framework of the III level Seismic Microzonation of the Pieve del Grappa municipality (Treviso, NE Italy), three paleoseismological trenches were dug, in order to investigate activity and capacity of the Crespano del Grappa backthrust.

The study area is located in the Veneto foothills, where the Plio-Quaternary external front of the Eastern Southern Alps (Castellarin and Cantelli, 2000) presently propagates with a 2-3 mm/y velocity towards the south (Serpelloni et al., 2016). The external front is composed of a series of arcuated WSW-ENE striking, S verging structures (Galadini et al, 2005). Moreover, the area is characterized by a medium-to-low seismicity with only one $M > 6$ earthquake during the last millennium: the 1695 Asolo event, M_w 6.45 (Rovida et al., 2016).

Regarding the structural framework, the study area is located between the Bassano-Vittorio Veneto Thrust to the north and the Bassano-Cornuda Thrust to the south. The investigated tectonic structure, i.e. the Bassano-Cornuda backthrust, is a N-verging E-W striking reverse structure. Moving from east to the west, it widely crops out near the Castalcucco village, causing a hundred meters displacement in the Miocene Molasse (Braga, 1970). In particular in Crespano village the thrust is responsible of an about 10 m vertical throw in the Quaternary alluvial conglomerates of Lastego river (Parinetto, 1987). Because of the urbanization, the paleoseismological trenches were realized at the eastern (Col Canil) and western (San Vito) borders of the village. In the former case, the trench cut through thick colluvial deposits that probably buried an abandoned valley. Differently, the second and the third trenches affected wide coalescent LGM alluvial fans, which border the southern slope of Mt. Grappa.

The results testify an intense Pleistocene-Holocene deformation of the Crespano del Grappa backthrust. Particularly, active deformation evidence deals with:

- back-tilting of the Holocene colluvial units;

- pronounced polyphasic liquefaction episodes, locally completely altering the sedimentary structures of colluvial units;
- a wide damage zone in the proximity of the morphological scarp and associated with the peak of the induced polarization. This observation testifies that the Crespano del Grappa backthrust reached the surface and displaced topography in the past, probably at the occurrence of one or more events which generated the paleoliquefaction effects;
- the 3-4 m displacement of the LGM alluvial fan deposits.

Concerning the age of the deformation, the dating of the involved units suggests a post LGM activation, probably recent-to-historical.

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