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## The TEST Site IRpinia fAult (TESIRA) project. Initial Findings from Active-Source Seismic Experiments

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The scientific project TESIRA (TEst Site IRpinia fAult), funded in 2021 by the University of Naples "Federico II", aims, through the integration of a multivariate dataset, to achieve a high-resolution 3D geophysical imaging of the shallow structure of the southern branch of the 1980 Ms=6.9 Fault at Pantano San Gregorio Magno (SA). The set of data acquired during the project life-span included: a microgravimetric survey; 3D and 2D Electrical Resistivity measurements; aeromagnetic and GPR surveys by drone; a CO<sub>2</sub> surface degassing measurement and a full-waver electric investigation.

Specifically, the active-source seismic dataset acquired at Pantano consists of four high- to very-high resolution seismic profiles spanning a total length of 3150 m and a high-resolution seismic volume covering an area of 12.5 acres. The seismic experiment's location was strategically chosen to illuminate key features of the Pantano basin affected by coseismic surface faulting, such as the rupture during the November 23,1980 Irpinia earthquake and the southern segment of the Pantano-San Gregorio Fault System (PSGM).

We share the early findings obtained through standard Common Depth Point processing and post-stack depth migration. Even at this initial stage, the results offer a clear picture of the intricate 3D structure of the basin, revealing a complex pattern of the carbonatic basement resulting from active faulting. Additionally, the seismic images underscore the evident influence of active faulting on the basin's formation and recent sedimentation. Future analyses, including full-waveform inversion and post-stack depth migration, are planned to enhance the imaging of this critical sector in the southern Apennines. Although seismic data present the highest resolution among the geophysical datasets at Pantano, their integration with the extensive data collected during the TESIRA project will facilitate a reliable interpretation of the complex basin subsurface, useful to improve our understanding of the interplay between active surface faulting and recent basin growth pattern.