



Three-dimensional seismo-tectonics in the Po Valley basin, northern Italy

Claudio Turrini (1), Pamela Angeloni (), Olivier Lacombe (1,2), Maurizio Ponton (3), Francois Roure (4,5)

(1) Sorbonne Universités, UPMC Univ Paris 06, UMR 7193, ISTEP, F-75005, Paris, France, (2) CNRS, UMR 7193, ISTEP, F-75005, Paris, France, (3) Dipartimento di Matematica e Geoscienze, Università degli Studi di Trieste, Trieste, Italy, (4) IFP-EN, Rueil-Malmaison, France and Utrecht University, the Netherlands, (5) Tectonic Group, Utrecht University, the Netherlands

The Po Valley (Northern Italy) is a composite foreland-foredeep basin caught in between the Southern Alps and Northern Apennine mountain belts.

By integrating the 3D structural model of the region and the public earthquake dataset, the three-dimensional seismo-tectonics of the basin is here illustrated for the first time at different scales of observation across the region. Despite the overall uncertainty due to the original data distribution-quality as well as the crustal scale model dimension, the positive correlation that structures and seismicity do show inside and around the study area, validate the performed 3D geo-volume while confirming the related active tectonic framework.

The association of structures and earthquakes shows how deformation mainly develops at the front of the Southern Alps and the Northern Apennines, these being, at present, advancing onto their common Po Valley foreland-foredeep domain. Here the hypocentres are essentially concentrated in the eastern sector of the basin.

While the 3D picture of a “living” tectonic system is visualized and analysed across the faulted structures of the entire Northern Italy, this study eventually indicates that the methodology can be a powerful tool for the understanding and validation of highly complex seismo-tectonic situations at both regional and local scale.