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3D Architecture and evolution of the Po Plain-Northern Adriatic Foreland basin during Plio-Pleistocene time

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The Pliocene-Pleistocene tectonic and sedimentary evolution of the eastern Po Plain and northern Adriatic Foreland Basin (PPAF) (extended ca. 35,000 km2) was the consequence of severe Northern Apennine compressional activity and climate-driven eustatic changes.
According with the 2D seismic interpretation, facies analysis and sequence stratigraphy approach by Ghielmi et al. (2013 and references therein), these tectono-eustatic phases generated six basin-scale unconformities referred as Base Pliocene (PL1), Intra-Zanclean (PL2), Intra-Piacenzian (PL3), Gelasian (PL4), Base Calabrian (PS1) and Late Calabrian (PS2).
We present a basin-wide detailed 3D model of the PPAF region, derived from the interpretation of these unconformities in a dense network of seismic lines (ca. 6,000 km) correlated with more than 200 well stratigraphies (courtesy of ENI E&P).
The initial 3D time-model has been time-to-depth converted using the 3D velocity model created with Vel-IO 3D, a tool for 3D depth conversions and then validated and integrated with depth domain dataset from bibliography and well log.
Resultant isobath and isopach maps are produced to inspect step-by-step the basin paleogeographic evolution; it occurred through alternating stages of simple and fragmented foredeeps.
Changes in the basin geometry through time, from the inner sector located in the Emilia-Romagna Apennines to the outermost region (Veneto and northern Adriatic Sea), were marked by repeated phases of outward migration of two large deep depocenters located in front of Emilia arcs on the west, and in front of Ferrara-Romagna thrusts on the east.
During late Pliocene-early Pleistocene, the inner side of the Emilia-Romagna arcs evolved into an elongated deep thrust-top basin due to a strong foredeep fragmentation then, an overall tectono-stratigraphic analysis shows also a decreasing trend of tectonic intensity of the Northern Apennine since Pleistocene until present.