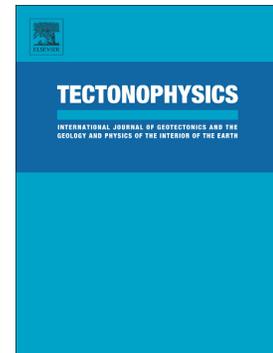


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The structural hinge of a chain-foreland basin: Quaternary activity of the Pede-Apennine Thrust front (Northern Italy)

Daniele Maestrelli ^{1,2}, Marco Benvenuti ², Marco Bonini ³, Stefano Carnicelli ², Luigi Piccardi ³,
Federico Sani ^{2,3}

¹ Università degli Studi di Pisa, Dipartimento di Scienze della Terra, Via S. Maria, 53, 56126, Pisa, Italy

² Università degli Studi di Firenze, Dipartimento di Scienze della Terra, Via G. La Pira, 4, 50121 Firenze, Italy

³ Consiglio Nazionale delle Ricerche (CNR), Istituto di Geoscienze e Georisorse (IGG), SS Firenze, Via G. La Pira, 4, 50121 Firenze, Italy

Corresponding author: Daniele Maestrelli, daniele.maestrelli@for.unipi.it , +39 3297265206, Università degli Studi di Firenze, Dipartimento di Scienze della Terra, Via G. La Pira, 4, 50121 Firenze, Italy

Abstract

The Pede-Apennine margin (Northern Italy) is a major WNW-ESE-trending morpho-structural element that delimits the Po Plain to the southwest and consists of a system of southwest dipping thrusts, generally referred to as Pede-Apennine Thrust (PAT). The leading edge of the chain lies further north-east and is buried beneath the Plio-Quaternary marine and fluvial deposits of the Po Plain. Whereas the buried external thrust fronts are obvious active structures (as demonstrated by the 2012 Emilia earthquakes; e.g. Burrato et al., 2012), ongoing activity of the PAT is debated. Using a multidisciplinary approach that integrates structural, seismic, sedimentological and pedological field data, we describe the recent activity of the PAT structures in a sector of the Pede-Apennine margin between the Panaro and the Enza Rivers (Emilia-Romagna). We found that the PAT is emergent or sub-emergent and deforms Middle Pleistocene deposits. We also infer a more recent tectonic phase (~60-80 ka) by Optically Stimulated Luminescence (OSL) dating of soil profiles that have been deformed by a recent reactivation of the PAT. Furthermore, we show evidence that the PAT and its external splay thrusts strongly influenced the drainage pattern, causing fluvial diversions and forcing paleo-rivers to develop roughly parallel to the margin. Finally, numerical Trishear

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