

T51G-08

Illumination of the Crustal Structure in the Southern Apennines using Teleseismic Receiver Functions,  
CAT/SCAN Project

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Field geology, well data and seismic imaging have illuminated the upper crustal structure of the Southern Apennines. However, lack of control of the deep structure allows viable competing thin-skin and thick-skin models of the orogen. In thin-skin models the detachment decouples a stack of rootless nappes from the basement. In thick-skin models, basement is involved in the most recent phase of thrusting. To examine the deep crustal structure, we use the teleseismic recordings from the CAT/SCAN array, deployed in southern Italy from Dec. 2003-Oct. 2005. We use receiver functions processed into a Common Conversion Point stack to generate images of the crust. We image three main westward-dipping seismic-velocity discontinuities where P-to-S conversions occur. They correspond to velocity jumps at the Moho, the upper-lower crust boundary and sedimentary interfaces resulting from the contrast between clastic and carbonate strata with basement. The CCP image matches features from both thin-skin and thick skin model. The lateral continuity of the converters favors thin skin, but consistent interpretation across the image favors the thick skin. Overall, the results provide a better fit to the thick-skin interpretation. This suggests a change in structural style as the collision with Apulia halted motion. This model also implies considerably less Plio-Pleistocene shortening across the Apennines and a SE motion of the Calabrian Arc subparallel to the southern Apennines rather than a radial expansion of the Arc.

7205 Continental crust (1219)

8038 Regional crustal structure

8102 Continental contractional orogenic belts and inversion tectonics

8170 Subduction zone processes (1031, 3060, 3613, 8413)

9335 Europe

Tectonophysics [T]

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