

On the 2016-2017 Central Italy Seismic Sequence: Uncertainty for Source Parameters of Mainshocks and Revised Catalogue of Moment Tensors

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The Central Italy seismic sequence began on August 24th, 2016, and was marked by three mainshocks in two months culminated with the Mw 6.5, October 30th, 2016, event. Location, depth and prevalent normal faulting mechanisms indicate that the sequence originated in the shallow crust of the Apennine chain where the current extensional regime overprints contractional structures. Structural complexity plays a major role in fault segmentation and interaction in this region, with important consequences on seismic behavior and mechanics of earthquake faulting. This complexity is evidenced by the co-existence of fault planes with different focal mechanisms in the same area.


Here we analyze the robustness of moment tensor solutions for the three mainshocks of the 2016-2017 Central Italy sequence. In particular, we study the effect of number and distribution of the inverted stations and employed wave speed model (1D and 3D) with the goal of providing more reliable estimates of the source parameters (strike, dip, rake and M_w) and corresponding uncertainties. The latter are estimated by performing a bootstrap analysis on hundreds of solutions computed by varying the distribution of stations for 1D and 3D velocity models. Moreover, we report on reviewed source geometries of the Central Italy sequence as retrieved by moment tensor analysis by integrating the actual TDMT revised catalogue (<http://terremoti.ingv.it/tdmt>) for M4+, with new updated solutions based on a new Italian 3D wave speed model. The realization of a complete moment tensor catalogue, in addition to the estimate of uncertainties associated to the computed focal planes and M_w for the three mainshocks, can contribute to explain the complexity of the seismogenic processes active in the Central Apennines and help in understanding the main features of this seismic sequence.

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 Feedback/Corrections?