

the ground motion distribution of the 2016 Mw 6.2 Amatrice, Italy earthquake using remote infrasound observations

The Mw 6.2 Amatrice earthquake that struck central Italy on 24 August 2016 was recorded by 7 infrasound arrays in the Euro-Mediterranean region at distances up to 1260 km, recording long lasting coherent wave trains characterized by large back-azimuth variations. The back projection of the stratospherically ducted infrasound illuminates radiating regions over ~600 km along the Apennines from Po basin to Gulf of Naples. A comparison between acoustic surface pressure derived from infrasound records and the seismic source pressure derived from measured seismic ground motion shows first order agreement in the attenuation with the epicentral distance. From these observations, seismic quality factors in Central Italy are estimated. The northernmost reconstructed source region comprises the Po Valley where seismic amplification occurred within plain alluvial sediments. These results show that infrasound records at hundreds of kilometers from a shallow moderate-magnitude devastating earthquake can provide ground shaking information as well as local amplification caused by topographic and geological features. Overall, these results give evidence of the surplus of the International Monitoring System for addressing issues being relevant for civil purposes and scientific research as well as for providing additional information as a complementary multi-technology network on potential natural hazards, especially in remote areas.

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