



Seismoacoustic Coupled Signals From Earthquakes in Central Italy: Epicentral and Secondary Sources of Infrasound

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In this study we analyze infrasound signals from three earthquakes in central Italy. The Mw 6.0 Amatrice, Mw 5.9 Visso, and Mw 6.5 Norcia earthquakes generated significant epicentral ground motions that couple to the atmosphere and produce infrasonic waves. Epicentral seismic and infrasonic signals are detected at I26DE; however, a third type of signal, which arrives after the seismic wave train and before the epicentral infrasound signal, is also detected. This peculiar signal propagates across the array at acoustic wave speeds, but the celerity associated with it is 3 times the speed of sound. Atmosphere-independent backprojections and full 3-D ray tracing using atmospheric conditions of the European Centre for Medium-Range Weather Forecasts are used to demonstrate that this apparently fast-arriving infrasound signal originates from ground motions more than 400 km away from the epicenter. The location of the secondary infrasound patch coincides with the closest bounce point to I26DE as depicted by ray tracing backprojections.