The 6 April 2009, M_w 6.3, L'Aquila (Central Italy) earthquake: characteristics of near-fault strong ground motions.

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On April 6, 2009, 01:32:40 UTC, a M_w 6.3 earthquake struck the Abruzzo region (Central Italy), close to L'Aquila, a town of 68,500 inhabitants. About 300 people died because of the collapse of many residential and public buildings and widespread damages were surveyed in L'Aquila and its neighboring municipalities.

The earthquake occurred at 9.5 km depth along a NW-SE normal fault with SW dip, located below the city of L'Aquila. This event represents the third largest earthquake recorded by strong-motion instruments in Italy, after the 1980, M_w 6.9, Irpinia and the 1976, M_w 6.4, Friuli earthquakes.

The available data set is composed of more than 300 digital three-components strong-motion records from $M_w \geq 4$ events recorded by Italian Strong-Motion Network (*Rete Accelerometrica Nazionale*, RAN) and by temporary stations managed by INGV MI-PV, with about 90 records within 50 km of the corresponding epicenters. This high-quality data set has been integrated in the new Italian strong motion database ITACA (ITalian ACcelerometric Archive, http://itaca.mi.ingv.it).

The mainshock was recorded by 56 strong-motion stations in the distance range from 0 to 250 km, characterized by different site conditions. Five recording stations (one station belonging to the MedNet broadband network), are within the surface projection of the inferred rupture plane, providing a set of near-fault strong motion recordings never obtained in Italy before. The horizontal peak ground accelerations recorded at these stations vary significantly ranging from 281 to 647 cm/sec^2.

This contribution presents an overview of the strong motion data set, discusses the dependence of the strong-motion parameters on source-to-site distance and azimuth and investigates the characteristics of near-fault records. Source-related velocity pulses are present on all the near-fault records, and, to a larger extent, on the AQK record, due to a combined effect of the seismic source radiation and the interaction with deep lacustrine sediments.