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Spatio-temporal variations of source parameters in the nucleation zone of the 6 April 2009, Mw 6.1 L'Aquila Earthquake

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We present the results of Brune stress drop ($\Delta\sigma$) and apparent stress (τ_a) variability of earthquakes located in a small zone adjacent to the hypocenter of the damaging Mw 6.1 L'Aquila earthquake. Their magnitude ranges between 2.7 and 4.1. Interevent variability of stress drop and apparent stress results in a factor of 10, well beyond the individual event uncertainty. Radiation efficiency $\eta_{sw} = \tau_a/\Delta\sigma$ varies mostly between 0.1 and 0.2, but decreases in the days immediately before and after the main shock to values as low as 0.06. This may be related to the migration of the events occurring in those days into a focal volume with higher dynamic strength. The temporal change of η_{sw} might be interpreted as a spatial variation due to the earthquake migration into the locked portion of the fault originating the main shock. Furthermore, no variation in stress drop and apparent stress can be observed between foreshocks and aftershocks but the smallest and largest $\Delta\sigma$ result in a good correlation with the largest and smallest b -values respectively, as already documented in literature in the rupture nucleation volume of large earthquakes.