



Source parameters of the 2013, Ms 7.0, Lushan earthquake and the characteristics of the near-fault strong ground motion

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The April 20, 2013 Ms 7.0, earthquake in Lushan city, Sichuan province of China occurred as the result of east-west oriented reverse-type motion on a north-south striking fault. The source location suggests the event occurred on the Southern part of Longmenshan fault at a depth of 13km. The maximum intensity is up to VIII to IX at Boxing and Lushan city, which are located in the meizoseismal area. In this study, we analyzed the dynamic source process with the source mechanism and empirical relationships, estimated the strong ground motion in the near-fault field based on the Brune's circle model. A dynamical composite source model (DCSM) has been developed to simulate the near-fault strong ground motion with associated fault rupture properties at Boxing and Lushan city, respectively. The results indicate that the frictional undershoot behavior in the dynamic source process of Lushan earthquake, which is actually different from the overshoot activity of the Wenchuan earthquake. Moreover, we discussed the characteristics of the strong ground motion in the near-fault field, that the broadband synthetic seismogram ground motion predictions for Boxing and Lushan city produced larger peak values, shorter durations and higher frequency contents. It indicates that the factors in near-fault strong ground motion was under the influence of higher effect stress drop and asperity slip distributions on the fault plane.

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