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Real-time ground shaking scenarios for early-warning applications in the Campania Region, Southern Apennines, Italy.

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The rapid development of early-warning systems for real-time applications worldwide requires that new methods for generating rapid scenarios able to represent patterns of potential damage would be formulated. The Campania Region, located in the Southern Apennines, Italy, is now covered by an advanced network that is equipped with highly dynamic and densely spaced instruments that will allow the registration of non-saturated time histories from a broad-band spectrum of magnitude. The network is mainly devoted to early-warning seismic purposes, and due to its geometric characteristics it is designed to provide rapid damage scenarios through the calculation of shake maps. These maps are simple or sophisticated representations of the ground shaking in terms of a selected strong ground-motion parameter that results from large earthquakes. As a consequence, the formulation of a regional attenuation relation along with the development of a method devoted to real-time shake maps generation is of great concern.

In the present study, after developing an *ad-hoc* attenuation relation, for rock site conditions, for the Campania Region, an updating scheme for real-time shake maps generation is presented. In particular, a real-time regression analysis performed on the data acquired during the on-going event is formulated and tested both on real and synthetic data. The updating procedure assumes that some of the coefficients in the attenuation relation remain constant during the occurrence of the earthquake because mainly related to the propagation medium while others can vary due to their dependence on the

characteristics of the particular ongoing event.

Moreover, to introduce site effects in ground motion estimates, a QTM-like classification for the main geological unit characterizing the region of interest, is presented. This allows to modify real-time shake maps that would result too simple to capture the real distribution of ground-motion when generated by using attenuation relations.