

Improvement of Offshore Earthquake Location in Earthquake Early Warning System

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We propose a simple method to improve the accuracy of location estimations for offshore earthquakes in the earthquake early warning (EEW) system. In the Geiger method for earthquake location (Geiger, 1910), a trial epicenter, depth and origin time are required in the location procedure. Usually the trial epicenter is given by the centroid of all triggered stations. The given centroid may far away from the actual epicenter for offshore events. As a result, the Geiger method may lead to a local minimum and the estimated earthquake location may be wrong. Instead of choosing the centroid as trial epicenter, we predefined 20 locations on the offshore area as trial epicenters and concurrently implemented those programs running Geiger method with the predefined ones separately. We assume the best estimation of earthquake location is given by the most timesaving program. The online EEW system has been tested from June of 2016 to January of 2017, detecting 155 earthquakes with magnitude range from 3.1 to 6.0. The results show that using predefined locations as trial epicenters in the Geiger method is able to not only improve the accurate of offshore earthquakes but also reduce the processing time.

Keywords: earthquake early warning, earthquake location, Geiger method

