



ALERT-ES EEWS in Southwest Iberia: feasibility and lead-time estimations.

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Earthquake Early Warning Systems (EEWS) should provide quick earthquake information and predict ground motion prior to the destructive S-waves arrive. One objective of the Spanish ALERT-ES project (CGL2010-19803-C03) is to study the feasibility of an EEWS for the SW of Iberian Peninsula, selecting two test sites (the S. Vicente cape area and the Gulf of Cádiz). These regions are characterized by the occurrence of large and damaging earthquakes such as the 1755 Lisbon ($M_{max}=X$) or 1969 S. Vicente Cape ($M_s=8,1$) shocks. In this work, we have used three different software packages (Earthworm, Seiscomp3 and PRESTo) to compare the efficiency of their different modules (picking, binder and location modules) in order to be used as an EEWS (new modules for Earthworms and Seiscomp3 are being developed, mainly a quick magnitude estimation module based in the analysis of the first few seconds of the the P-wave arrival). This pilot experience was carried out on four previously selected events (two in each test site). We analyse the origin time and location error using several software and seismic net configurations. A study about the blind zone and the available lead-time to selected targets (Huelva, Seville, Cádiz in Spain and Faro and Portimao in Portugal) was also performed. The results, using the existing seismic BB stations in the area, shown a blind zone in SW Portugal for earthquakes in S. Vicente and a blind zone in the Huelva and Cádiz (SW Spain) region for earthquakes in the Gulf of Cádiz. A 6 station binder provided the best compromise between the location error and available lead- time to targets, mainly due to the bad azimuthal coverage. For S. Vicente earthquakes, the lead-time time is 30/40 seconds for Huelva, 50/60 seconds for Cádiz, 60/70 seconds for Seville, about 10 seconds for Faro and Portimao follows inside the blind zone. For the Gulf of Cádiz earthquakes, Huelva, Cádiz and Faro are inside the blind zone, and lead-time is around 10/15 seconds for Seville, and 10 seconds for Portimao.