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Testing the global capabilities of the Antelope software suite: fast location and Mb determination of teleseismic events using the ASAIN and GSN seismic networks

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The Italian National Institute for Oceanography and Experimental Geophysics (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, OGS) is running the Antarctic Seismographic Argentinean Italian Network (ASAIN), made of 5 seismic stations located in the Scotia Sea region in Antarctica and in Argentina: data from these stations are transferred in real time to the OGS headquarters in Trieste (Italy) via satellite links. OGS is also running, in close cooperation with the Friuli-Venezia Giulia Civil Defense, the North East (NI) Italy seismic network, making use of the Antelope commercial software suite from BRTT as the main acquisition system.

As a test to check the global capabilities of Antelope, we set up an instance of Antelope acquiring data in real time from both the regional ASAIN seismic network in Antarctica and a subset of the Global Seismic Network (GSN) funded by the Incorporated Research Institution for Seismology (IRIS). The facilities of the IRIS Data Management System, and specifically the IRIS Data Management Center, were used for real time access to waveform required in this study.

Preliminary results over 1 month period indicated that about 82% of the earthquakes with magnitude M>5.0 listed in the PDE catalogue of the National Earthquake Information Center (NEIC) of the United States Geological Survey (USGS) were also correctly detected by Antelope, with an average location error of 0.05 degrees and average body wave magnitude Mb estimation error below 0.1.

The average time difference between event origin time and the actual time of event determination by Antelope was of about 45': the comparison with 20', the IASPEI91 P-wave travel time for 180 degrees distance, and 25', the estimate of our test system data latency, indicate that Antelope is a serious candidate for regional and global early warning systems.

Updated figures calculated over a longer period of time will be presented and discussed.