

EGU21-5062

<https://doi.org/10.5194/egusphere-egu21-5062>

EGU General Assembly 2021

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Efforts toward automatic aftershock sequences processing at the International Data Centre

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The number of aftershocks after a large main shock may increase the daily number of seismic events by an order of magnitude for a few days or even weeks. The large number of incoming arrivals reduces the effectiveness of automatic bulletin generation and significantly increases the work of the analysts. In the verification context such aftershocks may delay the production of the CTBTO Reviewed Event Bulletin, as well as mask clandestine nuclear tests. Consequently, the CTBTO has been investigating ways to improve the performance of the automatic processing during aftershock sequences.

In line with this investigation, the PTS launched a project with the objective to evaluate three algorithms that could address this issue, namely the Empirical Matched Field developed at NORSAR, the SeisCorr developed at Sandia National Labs and XSEL developed at the IDC. In this abstract we present comparisons on the performance of the three methods on the aftershock sequences of four very strong earthquakes: the Tohoku earthquake in Japan (March 2011), the Gorkha earthquake in Nepal (April 2015), the Illapel earthquake off the coast of Chile (September 2015) and the devastating earthquake in Papua New Guinea (February 2018).