Geophysical Research Abstracts
Vol. 20, EGU2018-10767, 2018
EGU General Assembly 2018

Performances of the New Real Time Tsunami Detection Algorithm applied to tide gauges data

Francesco Chierici (1,2), Davide Embriaco (2), and Sara Morucci (3)

(1) Istituto di Radioastronomia, Istituto Nazionale di Astrofisica, Bologna, Italy (chierici@ira.inaf.it), (2) Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy, (3) Istituto Superiore per la Protezione e la Ricerca Ambientale, Roma, Italy

Real-time tsunami detection algorithms play a key role in any Tsunami Early Warning System.
We have developed a new algorithm for tsunami detection based on the real-time tide removal and real-time band-pass filtering of seabed pressure time series acquired by Bottom Pressure Recorders.
The algorithm greatly increases the tsunami detection probability, shortens the detection delay and enhances detection reliability with respect to the most widely used tsunami detection algorithm, while containing the computational cost. The algorithm is designed to be used also in autonomous early warning systems with a set of input parameters and procedures which can be reconfigured in real time. We have also developed a methodology based on Monte Carlo simulations to test the tsunami detection algorithms. The algorithm performance is estimated by defining and evaluating statistical parameters, namely the detection probability, the detection delay, which are functions of the tsunami amplitude and wavelength, and the occurring rate of false alarms.
In this work we present the performance of the algorithm applied to tide gauge data.
We have adapted the new tsunami detection algorithm and the Monte Carlo test methodology to tide gauge records. Sea level data acquired by coastal tide gauges in different locations and environmental conditions have been used in order to consider real working scenarios in the test. We also present an application of the algorithm to the tsunami event generated by Tohoku earthquake on March 11th 2011, using data recorded by several tide gauges scattered all over the Pacific area