Geophysical Research Abstracts
Vol. 12, EGU2010-10842, 2010
EGU General Assembly 2010

Modeling of the hydro-acoustic signal and tsunami wave generated by sea floor motion including a porous seabed

Francesco Chierici (1), Luca Pignagnoli (2), and Davide Embriaco (3)

(1) Istituto di Radioastronomia, Istituto Nazionale di Astrofisica, sezione Bologna, via Gobetti, 101 - 40129 Bologna, Italy, (2) Istituto di Scienze Marine, Consiglio Nazionale delle Ricerca, sezione Bologna, via Gobetti, 101 - 40129 Bologna, Italy, (3) Istituto Nazionale di Geofisica e Vulcanologia, sezione Roma 2, via Pezzino Basso, 2 - 19025 Portovenere (SP), Italy

In the framework of a 2-D compressible tsunami generation model with flat porous seabed (Chierici et al., 2009), acoustic waves are generated and travel outside the source area: these waves carry relevant information as to seafloor motion which can be recovered from their first arrival.
The effects of the porous seabed, during tsunami generation and propagation processes, are wave amplitude attenuation and low pass filtering of both hydro-acoustic signal and tsunami wave.
The semi-analytical solution of the compressible water layer model overlying a porous seabed is presented, together with some results concerning the acoustic waves induced by seafloor motion in the water column.
Furthermore to include the effects generated by the coupling between compressible porous sediment and water layer, a simplified two layers model with the sediment modeled as compressible viscous fluid is presented. Results concerning the application of this model to the real case of 2003 Tokachi-Oki tsunamigenic event are also shown.