



## **The 27 February 2010 Tsunami triggered by the Mw 8.8 Maule earthquake (Chile): evidence for tsunami resonances at various scales**

S. Allgeyer (1,2), H. Hébert (2), R. Madariaga (1), F. Boudin (3), and P. Bernard (4)

(1) Laboratoire de Géologie, ENS, 75230 Paris Cedex 5, France (sebastien.allgeyer@cea.fr), (2) CEA, DAM, DIF, F-91297 Arpajon, France, (3) Géosciences Montpellier UMR 5243, 34095 Montpellier Cedex 5, France, (4) IPGP, UMR 7154, 75252 Paris Cedex 5, France

The 27 February 2010 tsunami was generated by the Mw 8.8 earthquake off Maule, 115 km NNE of Concepcion. This event is probably the strongest tsunami in the Pacific Ocean since 1960, when a Mw 9.5 in the southernmost part of the Chilean subduction triggered a transoceanic tsunami which caused casualties as far as in Japan. The 2010 tsunami is also one of the most extensively recorded events of the Pacific Ocean, on various sensors (tide gauges in harbours, pressure sensors in the deep ocean). In South America (on the Chilean and Peruvian coasts), there are more than ten tide gauges available, which exhibit amplitudes from 0.3 to 3.5 meters (peak to trough). We combine this observations with near field GPS and seismic data to constrain the size of the source. There is a substantial difference between the size of the rupture zone determined by local observations and the area of the aftershock zone determined by far field seismic data. We use different tide gauges to evaluate some characteristics of the earthquake source and/or tsunami initial deformation. In a second time, we use the same tide gauges to show some resonant characteristics, not only along the Chilean and Peruvian coasts, but also at the more distant coastlines of the Marquesas Islands (French Polynesia). Finally, we show preliminary modelling results of the inundations at several places in South America.