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Modeling of a 1960'th Chilean tsunami in Pacific Ocean within nonlinear-dispersive theory of long waves

A. Chernov (4), A. Korytko (3), I. Kostenko (3), E. Pelinovsky (1), A. Yalciner (2), A. Zaytsev (1,3,4)

(1) Department of Nonlinear Geophysical Processes, Applied Physics Institute, Nizhny Novgorod, Russia (Pelinovsky@hydro.appl.sci-nnov.ru, 007 8312 365976), (2) Department of Civil Engineering, Ocean Engineering Research Center, Middle East Technical University, Ankara, Turkey (yalciner@metu.edu.tr), (3) Special Research Bureau for Automation of Marine Researches, Uzhno-Sakhalinsk, Russia (aizaytsev@mail.ru), (4) Department of Applied Mathematics, Nizhny Novgorod State Technical University, Nizhny Novgorod, Russia

1960 Chilean centered Pacific Ocean tsunami and 2004 North West Sumatra centered Indian Ocean Tsunami are two important tsunamis of long distance propagation and impacts of tsunamis. Recent international studies on the propagation and dispersion effects of Indian Ocean tsunami showed that dispersion is one of the important parameters of numerical solutions of tsunami propagation.
May 23, 1960 earthquake with the approximate magnitude 9.0 caused approximately 750km rupture and generated tsunami at offshore Chilean Coast. Tsunami has reached 15-20m height at Chilean coast. The effects of this tsunami were observed not only near Chilean Coast but also in Japan after 22 hours propagation. Chilean tsunami was also felt in Kuril Islands and tsunami height reached to 4.7m near Severo-Kurilsk (Paramushir Island). Houses near the coast, warehouses and mooring facilities have been flooded. In Malokurilsk (Shikotan Island), the height of tsunami reached 4m, flooded the moorings facilities and some buildings, and damaged the bridge on a land. Many vessels became stranded because of broken anchors. Tsunami was also observed on all islands of the Kuril Ridge. The maximal height of rising of water was 4m at Shikotan Islands and 2.2m at on Kunashir Island, 2.5m at Iturup Island, and 1.3-1.5m at Matua Island. Tsunami entered the Sea of Okhotsk. In Magadan the height of rising of water was 2.2 m. the weak tsunami also was observed near Sakhalin Island.
The dispersion effect of 1960 Chilean tsunami and its long distance effects on Kuril Ridge have not been studied yet. In this study we developed the numerical model solving the long distance propagation of 1960 Chilean tsunami in Pacific Ocean and the assessment of its far field effects at Kuril Ridge. According to the modeling efforts, we made comparisons between the results of the numerical solutions using dispersive and non-dispersive long wave equations. The dispersion effects of long distance propagation of 1960 Chilean tsunami are discussed by comparing the results with the observations at Kuril Ridge.