

M9 Tohoku Earthquake Hydro- and Seismic Response in the Caucasus and North Turkey

Tamaz L. CHELIDZE¹, Ia SHENGELIA², Natalya ZHUKOVA¹,
Teimuraz MATCHARASHVILI^{1,2}, George MELIKADZE¹,
and Genady KOBZEV¹

¹M. Nodia Institute of Geophysics, Javakhishvili Tbilisi State University,
Tbilisi, Georgia; e-mail: tamaz.chelidze@gmail.com

²Ilia State University, Tbilisi, Georgia

Abstract

Presently, there are a lot of observations on the significant impact of strong remote earthquakes on underground water and local seismicity. Teleseismic wave trains of strong earthquakes give rise to several hydraulic effects in boreholes, namely permanent water level changes and water level oscillations, which closely mimic the seismograms (hydroseismograms). Clear identical anomalies in the deep borehole water levels have been observed on a large part of the territory of Georgia during passing of the *S* and Love-Rayleigh teleseismic waves (including also multiple surface Rayleigh waves) of the 2011 Tohoku *M*9 earthquake. The analysis carried out in order to find dynamically triggered events (non-volcanic tremors) of the Tohoku earthquake by the accepted methodology has not revealed a clear tremor signature in the test area: the Caucasus and North Turkey. The possible mechanisms of some seismic signals of unknown origin observed during passage of teleseismic waves of Tohoku earthquake are discussed.

Key words: Tohoku earthquake, Caucasus, hydroseismic response, teleseismic waves, multiple Rayleigh waves, local seismic response.