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Influence of Antarctic ice sheet on seismic waveform observations at intra-Antarctic region

TOYOKUNI, Genti[1*], TAKENAKA, Hiroshi[2], KANAO, Masaki[3]

[1]RCPEVE, Tohoku University, [2]Kyushu University, [3]NIPR

Recently, a lot of temporal broadband seismic stations had been installed on the intra-Antarctic region by the projects related to the International Polar Year (IPY) 2007-2008. Antarctica is known as a window toward the Earth's deep interior since it is the seismically quietest location on the Earth, it has wide extent enough to cover large epicentral distances needed to detect various seismic phases, and seismic waves observed at Antarctica cross regions within the Earth that previously have been sampled only poorly. We have been working to construct an accurate and efficient technique to model global seismic wave propagation. Our numerical scheme solves wave equations in spherical coordinates using the finite-difference method (FDM) based on the "2.5-D approach" which calculates 3-D seismic wavefields on a 2-D cross section of the Earth (e.g., Toyokuni et al., 2005, *GRL*).

This time, our method is applied to investigate influence of Antarctic ice sheet on observed seismograms obtained at intra-Antarctic region. We calculate synthetic seismograms for both a spherically symmetric Earth model PREM (Dziewonski & Anderson, 1981, *PEPI*) and a laterally heterogeneous model with a simplified ice sheet. In order to reduce equations and calculate synthetics up to higher frequency, only *SH* wave is simulated by using a torque source assigned at a depth of 600 km. The ice sheet model has a constant thickness of 3 km and single values of the density (0.914 g/cm^3) and the S-wavespeed (2 km/s). In the presentation we will show several results obtained for source time functions with various pulse widths (4 s-30 s).

Keywords: seismology, synthetic seismogram, finite-difference method (FDM), global modeling, IPY2007-2008, Antarctica