
S054-0012 - Source Spectra of Intermediate-depth and Deep Earthquakes in the Tonga Subduction Zone



Tuesday, 15 December 2020



07:00 - 23:59

Live Chat with Presenter Ended 15 December 17:00

Abstract

The physical mechanism governing the faulting of deep-focus earthquakes are still enigmatic. The Tonga subduction zone, which hosts about two-thirds of the world's deep-focus earthquakes, is one of the best places to study the mechanism. In this study, we focus on the source spectra and stress drops of the deep-focus earthquakes in the Tonga subduction zone region. We apply the spectral decomposition method to analyze seismic data recorded by a one-year (2009-2010) deployment of ocean-bottom seismographs in the Lau Basin and temporary seismic stations on islands of Tonga and Fiji. We isolate the source spectra and estimate corner frequencies and stress drops of ~800 earthquakes, with moment magnitudes ranging from 2.8 to 4.8. We divide the earthquakes into two groups, intermediate-depth (70-350 km) and deep (>350 km) earthquakes and explore how corner frequency and stress drop vary with respect to magnitude and depth. Our results show that the stress drops of intermediate-depth are statistically higher than that of deep earthquakes, implying different mechanisms for these two groups of earthquakes.

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