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Numerical modeling of abyssal T-wave excitation from mid-oceanic interplate tectonic/magmatic activities

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Abyssal T-waves recorded on autonomous underwater hydrophone (AUH) arrays can be used to more accurately locate mid-oceanic interplate tectonic and magmatic activities than teleseismic phases detected by land-based seismic stations. AUH's small location error is important to constrain mid-ocean low-level seismicity characteristics associated with plate motions. T-wave excitation mechanism and the physical meaning of AUH hypocenter, however, are not well understood. Park et al. (2001) used the modal scattering theory (Park and Odom, 1999) to explain the T-wave excitation mechanism. They found that scattering from the rough seabottom converts the acoustic energy of seafloor earthquakes into the propagating acoustic modes of T-waves. We modify the computer program of Park et al. (2001) and present numerical results for T-waves generated from submarine earthquakes and volcanic sources as we derive a moment-tensor representation of a volcano-seismic source.