



Determining the sensitivity of the amplitude source location (ASL) method through active seismic sources: An example from Te Maari Volcano, New Zealand

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Using active seismic sources on Tongariro Volcano, New Zealand, the amplitude source location (ASL) method is calibrated and optimized through a series of sensitivity tests. By applying a geologic medium velocity of 1500 m/s and an attenuation value of $Q=60$ for surface waves along with amplification factors computed from regional earthquakes, the ASL produced location discrepancies larger than 1.0 km horizontally and up to 0.5 km in depth. Through the use of sensitivity tests on input parameters, we show that velocity and attenuation models have moderate to strong influences on the location results, but can be easily constrained. Changes in locations are accommodated through either lateral or depth movements. Station corrections (amplification factors) and station geometry strongly affect the ASL locations laterally, horizontally and in depth. Calibrating the amplification factors through the exploitation of the active seismic source events reduced location errors for the sources by up to 50%.