

Schwenk, J. T., Miller, R. D., Ivanov, J., Peterie, S. L., and Sloan, S. D., 2012, Analysis of synthetic seismograms for the detection of voids using the surface-wave backscatter-analysis technique [Abs.]: 2012 AGU Fall Meeting, San Francisco, California, December 3-7.

We use the surface-wave backscatter-analysis technique to optimize the location of a void within a low-velocity-layer earth model. The synthetic seismograms are a product of previous research that sought to match V_p and V_s characteristics of a site located on the Yuma Proving Ground (YPG), Arizona. The YPG site utilizes an emplaced tunnel to further tunnel-detection research. Source offset, spread length, and frequency bandwidth were the primary processing parameters analyzed for optimization of the method. The superpositioning of forward-propagating and backscattered wavefields, along with the presence of higher-mode contamination, make interpretation and processing non-trivial. The translation of this research to real-world data sets may aid the detection of voids and tunnels in environmental, engineering, and defense applications.