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Review of a model for the response of a buried landmine to an
airborne acoustic signal

Doru Velea^a, Roger Waxler^b and James Sabatier^b

^aQinetiQ North America, Technology Solutions Group, 12030 Sunrise Valley Dr., Suite 400, Reston, VA
20191, USA

^bUniversity of Mississippi, NCPA, 1 Coliseum Drive, University, MS 38677, USA

Buried landmines can be found acoustically by insonifying the ground and detecting a contrast between the vibratory motion of the ground surface directly above the mine and a short distance away from the mine. Experiments have revealed a short-ranged spatial response and a frequency response that peaks around 100-200 Hz for anti-tank mines. The peak is believed to be a response to mechanical resonances of the mine itself. A model was developed to explain these experimental observations and to predict how the mine's resonance is influenced by the surrounding soil. In the model the soil was assumed to be an effective fluid while the mine was modeled as a right cylinder with a compliant top. The response of the top of the mine was modeled by an impedance condition. Predictions of the model are presented and compared with the phenomena observed in the field.