

**Measuring Primary and Secondary Wave Velocities on a Geotechnical Centrifuge Using Bender Elements**

by

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## **ABSTRACT**

Bender elements are piezoceramic transducers that generate and measure mechanical waves in soil. A system to measure in-situ compression and shear waves was developed for models on a geotechnical centrifuge. The compression wave velocity is used to determine the degree of saturation of a granular soil and the shear wave velocity is utilized to calculate the small-strain shear modulus. In this study, the logistics of a bender element system for a soil centrifuge are discussed. Voltage followers correct for impedance mismatch between the data acquisition system and transducers. Algorithms and software methods for improving signal quality and analysis are also described.