

Vertical Velocity Measurements in High Porosity Mudrocks under High Pressure

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ABSTRACT

Vertical velocity measurements are widely used, both in the laboratory and in-situ, in studying soil characteristics such as elastic behavior, pore pressures and stress-porosity-velocity correlations. This study focuses on increasing the stress levels in which vertical velocities are measured in a K_0 consolidated specimen by three times (1-10 MPa to 1-30 MPa). The laboratory testing is performed using piezoceramic technology, continuously measuring vertical shear and compressional velocities in a specimen under constant rate of strain (CRS) consolidation. Test results are provided showing vertical velocities measured in resedimented Gulf of Mexico- Eugene Island and Boston Blue clay, with the RGoM-EI having the higher velocities at all stress levels. The specimens underwent significant vertical strains as a result of increasing vertical stresses and decreasing porosities, and the velocities followed a power correlation with the increasing stresses.

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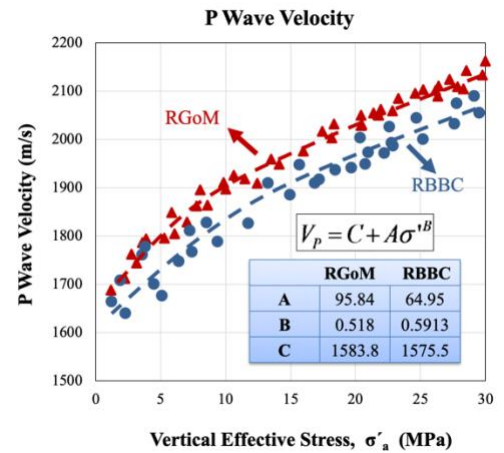


Fig 1: Vertical P Velocities (1-30 MPa)

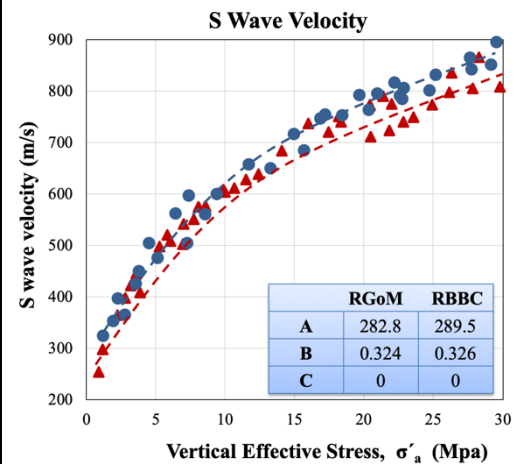


Fig 2: Vertical Shear Velocities (1-30 MPa)

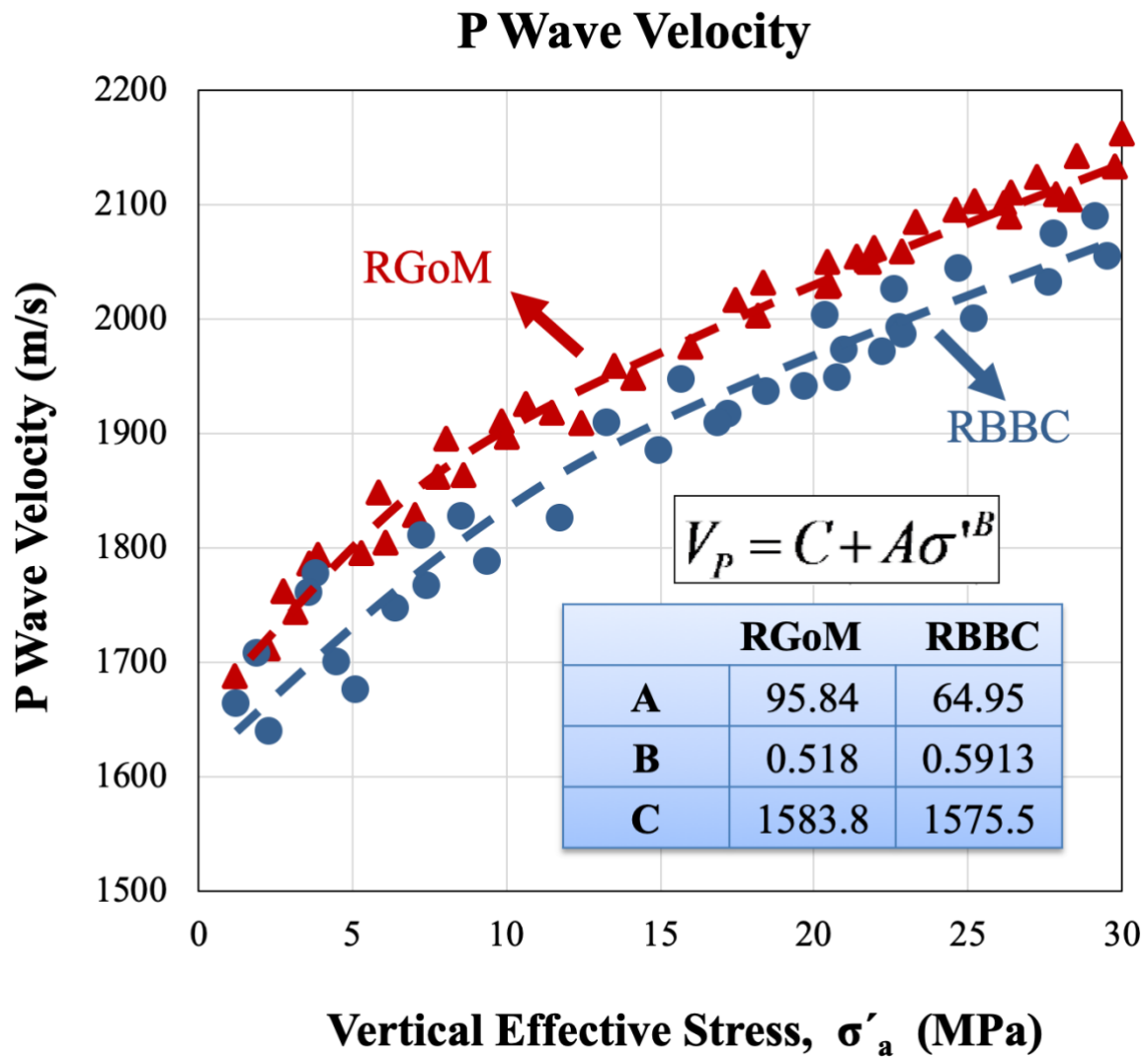


Fig. 1: Vertical P Velocities (1-30 MPa)

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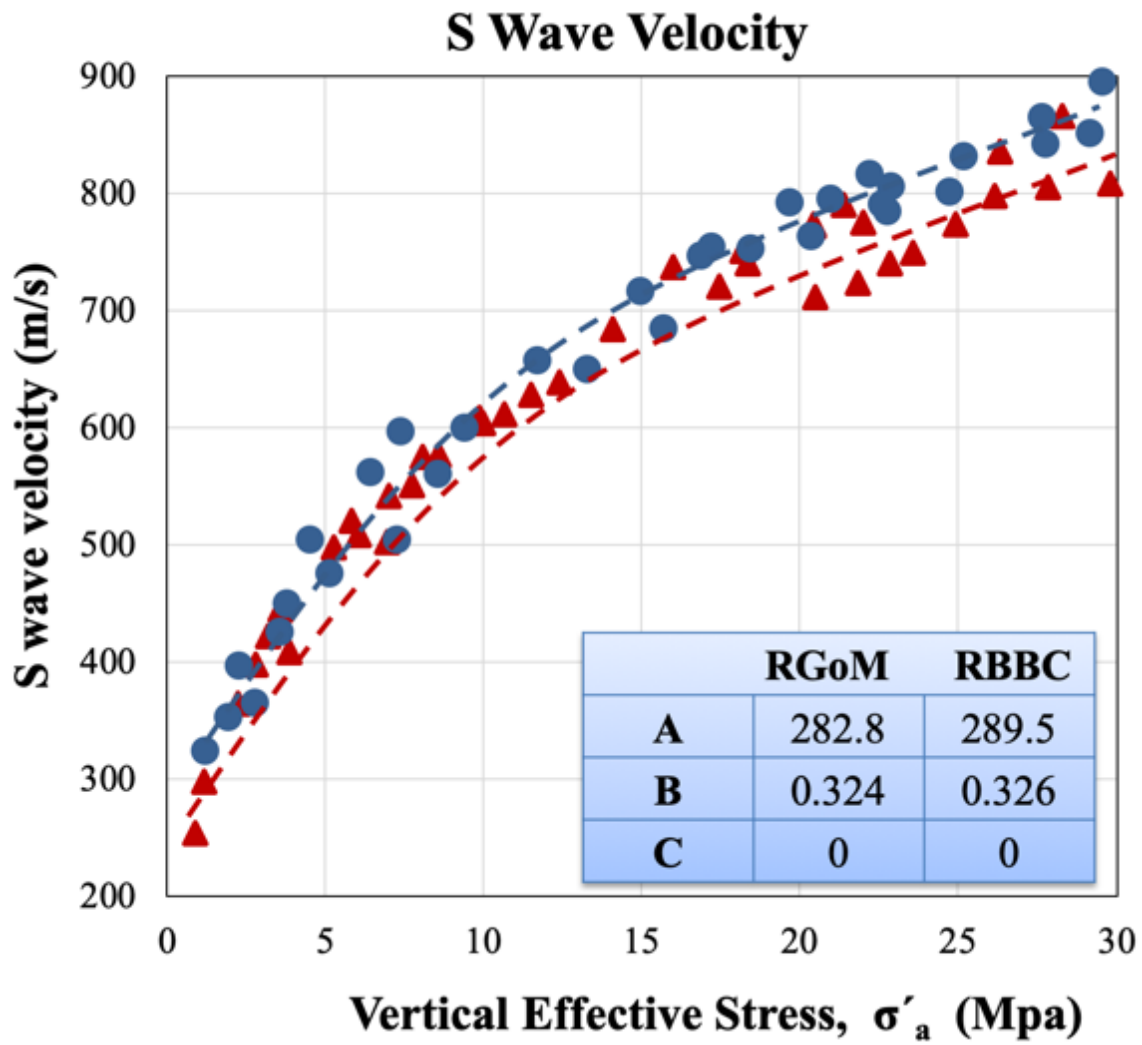


Fig. 2: Vertical Shear Velocities (1-30 MPa)

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