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Sound wave propagation within granular packings. LIAM SMITH, DANYAL MAGNUS, WILLIAM PROUD, Institute of Shock Physics, Imperial College London — The propagation of pressure waves in 3-dimensional mono-disperse and poly-disperse samples of soda-lime glass and sand were investigated. Packing density and confining pressure were varied. A preconditioning routine was developed to increase sample consistency. Piezoelectric transducers were used to both produce and record the passing of pressure pulses with time-of-flight and amplitude measurements allowing the analysis of attenuation, hysteresis and sound speeds. Times-of-flight were recorded from first deviations, giving greater repeatability due to the near isotropic propagation of initial wave fronts within packings. Sound speed measurements in mono-disperse packings under increasing pressures showed an initial non-Hertzian response preceding a distinct transition to a Hertzian response at higher confining pressures. A similar response was not observed in poly-disperse packings. Variations in packing dimensions showed a dependency of transition pressure on packing size.

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