

GHz ultrasonic measurement in DAC: preliminary measurement on KCl

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We have been developing an experimental technique of GHz ultrasonic measurements in diamond anvil cell (DAC). It is advantageous to measure elasticities of opaque materials and P wave velocities of silicate minerals under very high pressure (~100 GPa), comparing with Brillouin scattering in DAC.

Recently, we found a conventional way to transmit GHz acoustic wave into diamond anvil from GHz buffer rod. It was to place metallic thin foils (aluminum, copper, brass, etc.) between the buffer rod and the diamond anvil. Through the technique, we succeeded to get signal from KCl sample embedded in stainless steel (SUS) gasket.

The preliminary analysis shows two signals at around 10 ns and 20 ns. Here are two interpretations; (1) those correspond to SUS and KCl, or, (2) single and double reflection in sample or gasket. We hope that the succeeding analysis will soon reveal the question.

Keywords: elasticity, high pressure, KCl