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Measurements of Sound Velocities in Minerals and Implications for Composition of Earth's Interior

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Measurements of the elastic properties and sound velocities in minerals are necessary for using data from seismology to understand the composition and temperature of Earth's interior. In this talk, we briefly describe techniques used for measuring sound velocities and elasticity of minerals at high pressures and temperatures, emphasizing the Brillouin scattering method. We then go on, in the majority of the talk, to discuss the implications of the existing measurements of elasticity for understanding the state of the Earth's mantle. We conclude that there is strong evidence to support a non-uniform mantle that is compositionally layered.