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Kinetics and detectability of the bridgmanite to post-perovskite transformation in the Earth's D" layer

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Brigmanite, the dominant lower mantle mineral, crystallizes in the perovskite structure (Pv) and transforms into post-perovskite (pPv) at pressure and temperature conditions relevant for the Earth's D" layer. The Pv-pPv transformation can affect the dynamics of the Earth's lowermost mantle and provides an explanation for a range of seismic observations in the region. Questions remain, however, as to whether boundaries detected using seismic waves are due to the Pv-pPv transition. Here, we study the kinetics of the brigmanite to post-perovskite transition in-situ using diamond anvil cell experiments. We then model the kinetics of the Pv-pPv transition in D" and its effects on its detectability using seismic waves.