Thermal conductivity of lower mantle minerals from *ab initio* anharmonic lattice dynamics

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Determination of lattice thermal conductivity () of lower mantle minerals is a key to understanding the dynamics of the Earth's interior. Although determination of $\kappa$was impractical in the deep Earth *P, T* condition for a long time, recent experimental and computational developments have been extending the accessible *P* and *T* ranges (e.g. H. Dekura, T. Tsuchiya and J. Tsuchiya, Phys. Rev. Lett. 110, 025904, 2013). *Ab initio* prediction of κrequires understanding of the phonon-phonon interaction associated with the lattice anharmonicity. We recently succeeded in developing an efficient method to calculate it based on the density-functional perturbation theory combined with anharmonic lattice dynamics theory, and applying to $MgSiO_3$ perovskite in the whole lower mantle *P, T* range for the first time. Next we extend our techniques to other lower mantle minerals such as $MgSiO_3$ post-perovskite, and now calculations of more realistic Fe-bearing systems are also started. In this presentation, we introduce the current situation of our research on κ.

キーワード：地球下部マントル、フォノン輸送特性、第一原理計算
Keywords: Earth's lower mantle, Phonon transport property, First-principles calculation

