

## Effect of impurity on the seismic velocities of perovskite and postperovskite

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We calculated the acoustic velocities of perovskite and postperovskite in  $\text{MgSiO}_3$ ,  $\text{Fe}^{2+}\text{SiO}_3$  and  $\text{Al}_2\text{O}_3$  compounds, using the density functional method for a pressure range of the Earth's lower mantle. Both Fe and Al have considerable effects to decrease shear moduli of Mg-phases at deep mantle pressures, though the effects on the bulk moduli are small. We have also found that both Fe and Al influence elasticity of ppv more than that of pv. Therefore velocity contrasts between pv and ppv are expected to decrease with increasing Fe and Al contents. Using these data, we have modelled velocity structures of the deep mantle region. Positive velocity variations are suggested to hardly be produced in pv with the MORB composition.

Research supported by Ehime Univ Project Fund.