

Lost primordial continent

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We investigate bulk density variations of several compositions based on the pressure-volume-temperature equation of state of constituent mineral phases in the lower mantle. The density variations of pyrolite, hartzburgite, mid-ocean ridge basalt (MORB), tonalite-trondhjemite-granodiorite (TTG), and anorthosite are studied at a temperature of 300 K but at pressures in the lower mantle. The density of MORB is larger than that of pyrolite in the whole lower mantle, while the density of hartzburgite is slightly less than that of pyrolite. The density of anorthosite is comparable to that of pyrolite in the lower mantle and larger in the lowermost mantle, while the density of TTG is lower than pyrolite in the whole lower mantle. The result could imply the fate of the lost primordial continents, TTG and anorthosite crust. While the subducted TTG could be stagnant in the mantle transition zone, the lowermost mantle could be composed of the subducted anorthosite crust.