

The role of deep water cycle on the core-mantle interaction

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The deep water cycle to the bottom of the mantle via subduction of water-rich minerals in the cold plates may cause an interaction between water and liquid iron at the core mantle boundary. In this seminar, I show the experimental results on the reaction mechanisms and kinetics between hydroxides and metallic iron under pressure. A multi-anvil apparatus was used to achieve homogeneous temperature distributions within large sample volumes. The growth kinetics of the reaction rim show that the interaction between mantle and core would be enhanced by the presence of water. Based on the experimental data, I discuss the fate of water delivered to the deep mantle and the potential incorporation of water into the outer core.