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## Catalog of morphology of thermochemical plumes for seismic imaging in deep mantle

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Dynamics of thermochemical plumes from deepest part of mantle plays an important role in pattern dynamics and temporal evolution of mantle. We have conducted series of laboratory experiments on plume formation in density stratified layered system(Kurita & Kumagai 2004) and reported various types of thermochemical plume formed depending on the relative density contrast between the layers. The purpose of this study is to provide catalog of variety of thermochemical plumes in terms of seismic velocity structure.

In labo. experiments on layered system localized heat source produces various types of thermochemical plumes. When the density contrast between the layers is high enough thermal plumes are generated with minor amount of entrainment. The interface is characterized by cusp-shaped one. When the density contrast is small well-developed thermochemical plumes are generated. At intermediate range of the contrast thermal plume can separate from chemical one, which results in complicated structure and complicated temporal evolution. So-called failed plume appears here. Chemical plume in this range is characterized by dome-shaped structure. Considering these thermochemical structural images obtained in laboratory experiments we reconstruct seismic velocity structure of plumes with deep mantle situations. The velocity structures seem to be largely different from pure thermal model. This catalog would be useful in the interpretation of seismic images of the deep mantle.