

ILP task force group VIII - baby plumes in central Europe: Their origin and their seismic appearance

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The most important result of the seismic investigations in the French Massif Central at the beginning of the 1990' (French-German co-operative project Limagne 91/92) was the proof of an ascending material stream from larger depth (deeper than 250km), which due to its geochemical and petrological characteristics and its appearance was classified as a plume and which confirmed an already 20 years earlier expressed hypothesis. The really new of the results were that for the first time the exact size and shape of this plume at upper mantle depths was determined, as well as the fact that no plume head ('mushroom') could be found.

This led to the expression of 'baby plume' for this kind of feature in order to differentiate it from the classical idea of a plume (such as suggested by Shilling). The results from the Massif Central triggered similar seismic experiments in other regions of Central Europe with variscan basement and recent volcanism (such as the Eifel plume project and TRACK) and led to the proof of another such structure beneath the Eifel volcanic region.

Recent investigations let assume that the origin of these baby plumes lies in the mantle transition zone rather than at the CMB and that they might be connected to a fossil slab.

In this lecture an overview will be given of the current state of affairs concerning the seismic research on baby plumes, as well as possible causes for their presence will be discussed.