



Seismic tomography of the Massif Central - The plume story revisited

Michel Granet (1), Ulrich Achauer (1), and Guilhem Barruol (2)

(1) EOST-IPG Strasbourg, UMR 7516 CNRS - Université de Strasbourg, France (ulrich.achauer@eost.u-strasbg.fr, 0033-368-850125), (2) Géosciences Montpellier, UMR 5243 CNRS - Université de Montpellier 2, France

Picking up on the earlier ideas from the 70', that there might be a mantle plume beneath the Massif Central, and following extensive seismological and petrological field work in the French Massif Central in the beginning of the 1990's a small-scale plume beneath the volcanic zone in the central part of the Massif Central, ascending from asthenospheric depths was postulated (Granet et al., 1995 a, b). Including Bouguer gravity and petrophysical modelling arguments this fascinating idea was further established and the name "baby-plume" was created for this kind of phenomena (Sobolev et al., 1997). However, the southeastern end and the depth extension of this plume structure could not be properly established, due to the limited aperture of the seismic arrays used at the time. This triggered a new research program, called TRACK, with the aim of tracking the traces of supposed small-scale continental mantle plume structures by integrated seismological methods. Part of Track was a new seismological field experiment carried out in central-southern part of the Massif Central in 1998/99, with seismic tomography and the study of seismic anisotropy at its core.

The joint analysis of both data-sets suggests that the plume deflects to the South-East with depth, in accordance with the flow pattern suggested from SKS-splitting (Barruol and Granet, 2002).

In this paper we will present the new results (size and depth extent) of the mantle plume beneath the Massif Central and discuss the geodynamic implications.