

Looking for Mantle Plumes by *Humphreys and Schmandt, Physics Today, August 2011, p.34-39.*

Mantle plumes as a precursor or a cause to 'hotspot' volcanism within plates as opposed to those commonly prevalent on plate margins both at the divergent, mid-oceanic ridges and collisional, subduction zones, often leading to large igneous provinces (e.g. Siberian, Karroo, Deccan and others) was first put forward by Morgan during the early 1970s. The origin and evolution of plumes, however, has been debated intensively during the last three

decades. In this recent article under review, Humphreys and Schmandt evaluate the plume concept, its origin at the thermal boundary layer (liquid outercore- lower mantle), and evidences that support and contradict taking examples from Hawaii, Yellowstone and Siberia. The powerful tool of seismic images, based on travel-time delays or early arrivals of S waves from distant earthquakes provides information about mantle properties (temperature and

melt fractions at a given depth) as to how existing plume traces manifest as also the complications that arise from other asthenospheric attributes such as crystallographic phase transitions between 410-660 km depths besides compositional stratifications, that complicate convective flow of a vertical plume regimes. Subducting oceanic plate seem to influence the Yellowstone plume and drift it from its vertical ascent.