

**OIB sources - mantle domains: the incompatible trace element ratio (Th/La,Nb/La) tool analysis**

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The Nb/La vs Th/La diagram displays interesting properties allowing to constrain the magma sources compositions, to identify intra-mantle magmatic differentiation trends and to evaluate the residual characteristics of the mantle sources induced by Continental Crust (CC) differentiation.

These properties allow to interpret the trends formed by the MORB's with associated OIB's in the Mid Atlantic Ridge – East Pacific Ridge (MAR-EPR) and in the Indian Ocean (IO) which distinguish one another in these two oceanic realms (in the  $^{208}\text{Pb}/^{204}\text{Pb}$  vs  $^{206}\text{Pb}/^{204}\text{Pb}$  as the Nb/La vs Th/La diagram, identifying the DUPAL anomaly (Hart 1984)), to a genesis of these OIB's from an assemblage mainly composed of residual peridotitic mantle and recycled oceanic crust differentiated from these domains. The distinct compositions of these two domains can be related to distinct residual characteristics relatively to CC differentiation.

Distinguishing from the previous OIB's, the OIB's associated to the two superplumes evidenced from tomographic studies rising from the lowermost mantle within the Mid Pacific and below South Africa, show compositional characteristics indicating sources displaying less intense residual characteristics relatively to CC differentiation than the respective previous upper domains. These sources may thus represent materials composed by recycled oceanic crust derived from less depleted mantle (older oceanic crust) and also partly enriched in recycled CC material. This analysis therefore evidences two large oceanic domains with distinct global compositions but similar material sources assemblages located in opposed earth hemispheric areas, and at the base of the mantle, domains sampled by the two superplumes with estimated source compositions displaying respectively less residual characteristics than the upper intruded domains.