Geochemical mapping of North Fiji Basin: Evidence for the source heterogeneity and distribution of mantle domains

JIHYE OH[1], JONGUK KIM[1] AND JAI-WOON MOON[1]

[1]Deep-sea and Seabed Resources Research Division, Korea Institute of Ocean Science & Technology, Ansan, Korea (glauxo@kiost.ac)

The North Fiji Basins (NFB) is a mature back arc basin having several segmented active spreading centers. In here, we present major, trace element and Sr-Nd-Pb isotopic data of basaltic glasses sampled along the Central Spreading Ridge (CSR) of the NFB to decipher the source heterogeneity and its spatial distribution.

The "MORB-like" basaltic samples of the CSR can be divided into calc-alkaline series in the northern segments and low-K tholeiite series in the southern segments by major element composition. Combined trace and isotopic data suggest these two distinct magmatic series cannot be produced only by magma differentiation or partial melting, indicating source heterogeneity beneath the NFB. The basaltic samples in the northern spreading ridge, characterized by enrichment in incompatible elements, show E-MORB composition possibly affected by mantle plume (i.e. Samoan plume). Conversely, samples from the southern segments show depleted N-MORB composition with arc signature (i.e. negative Nb anomaly). Both enriched and depleted magmas erupted bimodally at the 16°50' triple junction located between the northern and southern segments.

Previous studies suggested that the Indian-MORB Mantle (IMM) is dominant in whole CSR and the occurrence of the Pacific-MORB Mantle (PMM) is restricted to the Vanuatu Arc within the NFB (i.e. [1]). However, basalt samples form the southernmost segment, separated by an offset of ~80 km, show isotopic composition of the PMM signature, which suggests an extension of PMM domain to further north than in previous work. Therefore the offset can be a possible boundary between the PMM and IMM domains.

[1] Pearce *et al* (2007) *Earth and Planetary Science Letters*, **260**, 98-114