Shatsky and Hess Rise in the NW Pacific: Genetically-related twins or just neighbors?

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The NW Pacific hosts two large oceanic plateaus of volcanic origin: Shatsky and Hess Rise located ~1200 km apart. Shatsky Rise volcanism started 145 my ago at the Pacific-Farallon-Izanagi triple junction [1]. Its geochemical composition is consistent with involvement of a mantle plume, although no ultimate evidence for a deep mantle origin could be provided. Much less is known about Hess Rise. Based on DSDP drilling results, the igneous basement of Hess Rise most likely formed between ~110-100 Ma [2], about 35 my later than the Shatsky Rise, which would reflect a similar time lag as suggested for the two main volcanic pulses detected at Ontong Java, the largest known oceanic plateau [3]. The inferred age progression along Shatsky and Hess Rise would be consistent with the idea that both plateaus formed over the same hotspot [4], with Hess Rise representing a second pulse of the Shatsky plume. Both plateaus seem to be connected by two features: 1) a broad belt of seamounts, the Ojin Rise Seamounts, and 2) Papanin Ridge, a narrow ridge that turns from a SSW-NNE-oriented extension of Shatsky Rise into a SE-oriented structure pointing towards Hess Rise. Both features could represent time-progressive hotspot tracks but no age information is available from these structures thus far. Here we present new trace element and isotopic data from Ojin Rise Seamounts, northern Shatsky Rise dredge, and Hess Rise DSDP drill core samples. We compare our results with recently published Shatsky Rise data sets, in order to evaluate a possible genetic relationship among them. Interestingly, our preliminary Hess Rise data show a similar isotopic spread to Shatsky Rise, with Nd isotope ratios trending towards an Enriched Mantle (EM) composition. A similar trend is also suggested for some late stage Shatsky and Ojin Rise seamount samples.

[1] Geldmacher et al. (2014) *Int. J. Earth Sci.* **103**, 2351-2357. [2] Vallier et al. (1983) *Geol. Soc. Am. Bull.* **94**, 1289-1307. [3] Tejada et al. (2002) *J. Petrol.* **43**, 449-484. [4] Sager (2005) *Spec. P. Geol. Soc. Am.* 388, 721-733.