



Hotspot motion, paleomagnetic tests of plate circuits, and coherency of the Pacific plate

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Paleomagnetic studies, analyses of plate circuits and geodynamic modeling results have all pointed toward the motion of the Hawaiian hotspot during formation of the Emperor Seamounts. Here we examine standard plate circuits that transfer data to the Pacific basin through West Antarctica (e.g. Cande et al., 1995) and a new circuit that uses a path through the Lord Howe Rise (Steinberger et al., 2004). We find that both circuits pass paleomagnetic consistency tests and yield hotspot motion rates that are compatible with Pacific data based on rigorous rock magnetic and paleomagnetic analyses. Similarities between the Hawaiian-Emperor and Louisville tracks of the Pacific plate suggest that the hotspot motion may reflect basin-wide flow. New age data, however, also point toward the possibility of intra-basin hotspot motion or lithospheric control on hotspot tracks. We also test coherency of the Pacific plate since the Late Cretaceous to evaluate the degree to which intra-plate deformation could have affected hotspot tracks.