Geophysical Research Abstracts, Vol. 9, 04521, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04521

Mantle plumes and the Pacific superswell

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We present a model based on mantle plumes that could explain many of the anomalous features of the superswell region. First, long-time subduction around the rim of the Pacific would drive flow in D" toward the center of the 'rim of fire'. This continuous supply of D" would promote the concentration of plumes into the superswell region (and also on the other side of the earth in the African superplume region). This is independent of migration of the subduction zones as the Pacific closes in pace with the opening of the Atlantic and Indian oceans. Second, longterm outward conduction of heat from the plume pipes would heat the mantle between the pipes (it would heat outward ~ 100 km in 100 m.y.; ~ 200 km in 400 m.y.). This heating of the 'background' mantle up to plume temperatures would change the geotherm of the superswell region compared to 'normal' regions - this hotter geotherm could disturb the equilibrium of the 660-400 km region of the mantle from its normal pattern. This would lead to many short-term instabilities, which could provide an explanation for the many short-lived features of this region.