Geophysical Research Abstracts
Vol. 15, EGU2013-3710, 2013
EGU General Assembly 2013

Along ridge variation of the seafloor cooling and subsidence

Po-Ju Huang and Ling-Yun Chiao
National Taiwan University, Oceanography, Taipei, Taiwan (r00241309@ntu.edu.tw)

Bathymetry is linearly proportional to the square root of the seafloor age according to decades of observations. It is well explained by the essentially one-dimensional thermal contraction such as that demonstrated in the classical half-space cooling model and the subsequent 2-D modifications such as the plate model, GDH1 model, PSM model etc. However, much less efforts have been undertaken on study of variation of seafloor cooling along the ridge axis. We carefully examine corridors in the spreading direction that avoid seamounts and other some secondary structures, in addition to the sediment correction. We find that subsidence rates vary along major mid-ocean ridges. It would require a range of 400 to -600°C difference if the subsidence rate variations are attributed entirely to sub-ridge mantle temperature anomalies. Pronounced anomalies include the noticeable lows at the equator in the mid-Atlantic ridge and the northern section of East Pacific Rise that might be attributed to the close by continental lithosphere. The eastern section in mid-Indian ridge is also significantly cooler within regions of the Australian-Antarctic Discordance (AAD), which has been attributed to an ancient slab stalled beneath the present-day Southeast Indian Ridge (SEIR). Further researches that take into account of trends of geoid data is underway to make consistent interpretations.