AGU Fall Meeting
San Francisco, USA
5–9 December, 2005

Eos Trans. AGU, 86(52)
Abstract T41E-1349

Seafloor generation at a melt-poor ultra-slow-spreading ridge

M. Cannat [1], D. Sauter [2], J. Escartín [1], V. Mendel [2]

[1] CNRS, Institut de Physique du Globe de Paris, 4 place Jussieu, Paris, 75252, France
[2] CNRS, Institut de Physique du Globe de Strasbourg, 5 rue Descartes, Strasbourg, 67084, France

Our study focuses on the melt-poor, easternmost region of the Southwest Indian Ridge. We use a large set of off-axis bathymetry, gravity, and magnetic data (extending up to about 28 myrs-old lithosphere) to analyse accretionary processes and their evolution in time and along the ridge. We show that a significant proportion of the seafloor in our study area formed at a ridge that had no, or little volcanic activity, contradicting the view of all mid-ocean ridges as primarily volcanic systems. Axial volcanism appears controlled by punctuated events of focused magma supply, with dykes shooting out laterally into the “a-volcanic” regions. We also show evidence for large offset normal faulting (locally leading to the formation of corrugated surfaces), and for very persistent and extensive axial tectonic asymmetry (up to 25 myrs in a 100 km-long portion of the ridge). We use a sequence of kinematic reconstructions to discuss fault mechanisms, and the role of melt supply, spreading rate and ridge obliquity on ultra-slow accretion processes.