25th EGS General Assembly
Nice, France, 24-29 April, 2000

Geophysical Research Abstracts
Vol. 2

CRUSTAL ACCRETION AT THE 9°03'N OVERLAPPING SPREADING CENTER, EAST PACIFIC RISE

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A 3-D seismic reflection and tomographic survey was conducted at the 9°03'N overlapping spreading center (OSC) to better understand the relationship between ridge-axis discontinuities and magmatic segmentation along the East Pacific Rise. Travel-time data from 19 ocean bottom hydrophones were analyzed by three-dimensional tomographic modelling. Areas of thick Layer 2A seem to correlate with the distribution of relict overlap basins and ancient propagating ridge tips. A low velocity zone underlies the ridge axis discontinuity and a strong axial melt lens reflector is detected both limb and the northern part of the overlap basin. The eastern melt lens, 4 km wide to the north of the basin, narrows significantly towards the south and finally plunges by 500 meters before disappearing. 3-D reflectivity images reveal that this feature is partly fed through pathways of magma emerging from beneath the overlap basin. In contrast, the western melt lens has a geometry more typical of the EPR - narrow width and constant depth. Wide-angle and vertical incidence Moho reflections indicate a crustal thickness normal on average however it is about 2 km thinner at the two relict basins located west of the ridge axis. We take advantage of the new seismic model and pre-existent geochemical data to investigate the origin of strong magnetic signal observed at the OSC.