



A revised model of oceanic core complex structure? Indications from IODP expeditions 304-305, Mid-Atlantic Ridge, 30°N, and previous ocean drilling results

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IODP expeditions 304-305 results at the Mid-Atlantic Ridge 30°N (Atlantis Massif), taken together with recent results from seafloor mapping and ODP drilling in the Atlantic as well as on the SWIR, suggest that a revised model of oceanic core complex (OCC) development should be considered. The 18 ODP/IODP boreholes (from 15 to 1508 meters below sea floor) drilled on the summits of 4 different core complexes and/or inside corner highs so far have recovered only gabbroic sections, whereas the flanks of these structures have commonly yielded serpentinite instead. Here we explore aspects of a possible revised model for oceanic core complex development where significant intrusive activity is episodic beneath a slow-spreading ridge segment end. Exposure of the gabbroic body(ies) is enabled by deformation that localized predominantly within the serpentinitized peridotite that initially surrounded the intrusion(s). The development of a detachment fault system on the central dome of Atlantis massif may have occurred relatively late in its evolution, controlling the exposure along a domal high via mostly brittle faulting. Many questions arise when considering such a model that will require further investigations. In this presentation we review the evidence (including composition, estimates of depth of intrusion, paucity of high temperature deformation) that lead us to suggest a revised model and we discuss some of the implications for spreading processes, noting how they differ from the concepts upon which

previous models of oceanic core complex formation are based.