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Mabahiss Mons, 25.5°N Red Sea Rift: Tectonics and Volcanism of a Large Submarine Dome Volcano

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Only little is known on the geological context of the Mabahiss Deep, located in the northern Red Sea at 25°29'N, 36°04'E. In comparison to the central Red Sea, the flat-bottomed morphology of this deep does not depict organized seafloor spreading (Martinez & Cochran 1988). Previous low resolution bathymetric (>100 m grid cell size) and crude geophysical data were unable to give detailed account on the transition from the central towards the northern Red Sea Rift and the role of the Mabahiss Deep therein.

New high resolution bathymetric datasets of this region, collected during R/V Pelagia cruise 64PE351 in April 2012, reveal numerous details of the volcanism, tectonics and related sedimentary features in and around the Mabahiss Deep with focus on an unusually large, Venusian-type pancake dome volcano (first described by Guennoc et al. 1988). The main volcanic building, the Mabahiss Mons volcano, is about 8 km in diameter and rises to an average height of 450 m above the surrounding seafloor. Mabahiss Mons hosts a 2000 m in diameter and 50 m deep caldera. Satellite volcanoes and small volcanic cones are scattered around the main edifice and towards the SE. Multibeam backscatter data suggest recent eruptive activities at the flanks and within the caldera.

In our first results of tectonic, volcanic and petrological investigations in the vicinity of Mabahiss Mons volcano, based on high-resolution bathymetry, backscatter data and ground truthing, we present terrain analyses, preliminary geochemical data and petrological observations from MOR-basalts. The newly collected data will help to unravel the role of the Mabahiss Deep in the geological setting of the Red Sea and the changeover from the central to the northern Red Sea Rift.

References:

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