

EAST ANTARCTIC VOLCANIC MARGIN: CRUSTAL STRUCTURE AND TECTONIC EVOLUTION

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Volcanic passive margins are formed where continents breakup causing flood volcanism during prerift and/or synrift stages of the continental separation. The significant magmatism are caused by the rising of the mantle plume which had penetrated the lithosphere of central Gondwana.

The early stage of Gondwana break-up is marked by significant flood basalt volcanism in the Karoo (SE Africa) and WDML (East Antarctica) from the initial expression of a mantle plume around 179-162 MA.

This work is focused on the study of the crustal structure and evolution of East Antarctic volcanic continental margin. It aims to generalize the knowledge on East Antarctica volcanic passive margins, and to characterize crustal architecture of the East Antarctic volcanic margin in terms of volcanostratigraphy and to compare it with the existing models.

This study will integrate different available data, including published articles, books, and seismic surveys acquired by PMGRE expeditions within 2011-2013.

Seismic data collected on the East Antarctic margin (in the eastern Weddell Sea and Lazarev Sea) show typical characteristic of volcanic margins. Following volcanostratigraphy concepts, the main volcanic facies (Outer SDR, Outer High, Inner SDR) were identified, mapped and analyzed. An attempt to reconstruct conjugate margins which were formed as a result of Gondwana break-up. The crustal transects obtained in the current study outlines the crustal structure of the central Lazarev Sea and Falkland Plateau and the eastern part of the Weddell Sea and Central Mozambique Ridge accordingly.

Differences in the estimation of the age formation of Explora wedge (Middle Jurassic) and the East Weddell Sea crust based on magnetic anomalies (Late Jurassic) can be explained by the changes in strain localization which controlled by in depth magma distribution and causing the shift in the axis of the spreading. Similarly to North and South Atlantic excess magmatism at rifted margins, rifting in the East Antarctica probably occurred with the excess magmatism while opening has happened from the Risser-Larsen to the Weddell Sea.