

PRELIMINARY RESULTS OF MARINE HEAT FLOW MEASUREMENTS ACROSS THE EASTERN FLANK OF THE ADARE TROUGH, ANTARCTICA: POSSIBILITY OF HOTTER THAN NORMAL ASTHENOSPHERE?

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ABSTRACT

The Adare Trough, one of the West Antarctic rift system, is known to form with seafloor spreading on a limb of a ridge-ridge-ridge triple junction between the Australia, East Antarctica and West Antarctic plates based on magnetic anomaly pattern. It was active from some time before chron 20 (43 Myr) to chron 8 (26 Myr), and is currently a fossil rift valley. Spreading rate since chron 20 is different in the eastern and western flanks (7 and 5 mm/yr, respectively), however, we do not know reason for an asymmetric spreading. In the ridge setting, marine heat flow measurement could be the first step to resolve this issue because it can directly show the current state of thermal regime of the asthenosphere. During the recent Korean RVIB Araon's Antarctic Expedition (ANA05B; Dec 12th 2014-Feb 25th 2015), we made an attempt to measure heat flow using 5-m long Ewing-type heat probe at five stations across the eastern flank of the Adare Trough along with the RVIB Palmer 9702 line, however have collected data only at three stations due to harsh conditions. As a preliminary result, observed heat flow values are significantly higher than estimated ones with the GDH1 model, suggesting that various possibilities of the asthenosphere including hotter than normal asthenosphere below at least the eastern flank of the trough. It is certain that more observations and analysis are required to attest hypotheses, and thus we plan to collect supplementary data in the upcoming Araon's Antarctic expedition in 2016.