

**Morphological characteristics of off-axis volcanism in the vicinity of the easternmost segment of the Australian-Antarctic Ridge**

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**Abstract Text:**

The Australian-Antarctic Ridge (AAR) is an intermediate spreading system positioned to the east of the Southeast Indian Ridge (SEIR) and extending to the Macquarie Triple Junction (MTJ) of Australian-Antarctic-Pacific plates. The KR1 and KR2, the easternmost segments of the AAR system, are separated by the Balleny Fracture Zone (FZ) stretching NNW-SSE direction. During the recent oceangoing surveys of R/V *Araon*, we identified 3 volcanic seamount chains aligned roughly perpendicular to the KR1 ridge axis. The high-resolution shipboard bathymetric data show that each seamount chain consists of several isolated volcanic constructs. Height of the seamounts varies from a few hundreds of meters up to ~2 km; the largest seamount has a volume of ~300 km<sup>3</sup>. The seamounts situated in the western and eastern ends of the KR1 are significantly larger in height and volume compared to the seamounts stretching southward in the central KR1. In addition, we estimated the age of seamount formation using the forward magnetic modeling. As a result, the seamount chains were formed within the last ~3 Myrs; each edifice of the seamounts had been constructed by volcanic activity lasted approximately for 250~600 kyrs. As we can assume a seamount is constructed after the seafloor is formed at ridge axis, comparison of the geomagnetic polarity of the given seamount with the polarity of the pre-existing seafloor can be used to constrain its formation age. The forward magnetic model shows that each seamount chain has at least one seamount having the polarity reversed from that of the pre-existing seafloor. Furthermore, the model indicates that the formation of all the seamounts surveyed in the area appears to be concentrated on ~0.52 Ma, ~1.02 Ma, ~1.86 Ma, and ~2.45 Ma. Here we present the morphological characteristics of these seamounts and discuss their tectonic implications based on their magnetic properties.

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