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THE OPENING OF DOVE BASIN: NEW DATA ON THE SCOTIA ARC DEVELOPMENT

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Dove Basin is a small oceanic basin developed in southern Scotia Sea. It is located in between the continental Pirie Bank, to the west, and Bruce Bank, to the east. Southwards, an E-W elongated depression separates the basin and the South Orkney microcontinent, while to the north it is connected to Central Scotia Sea. The NNE-SSW elongated ridge, observed in its central part, suggests that an oceanic spreading producing the separation of Pirie and Bruce Bank took place in ESE-WNW direction.

During the SCAN2004 cruise carried out by the R/V Hesperides, new geophysical data have been recorded along four sections, orthogonal to the central ridge that roughly coincides in most of the profiles with the spreading axis. Magnetic profiles provide new data on the basin opening. Comparison of magnetic anomaly profiles evidence a poor correlation in some cases, possibly due to the presence of transform faults or other post-spreading processes. While along the northern profiles, oceanic spreading axis coincides with a maximum, in the southern profiles is located in a minimum, with local minor maxima, suggesting that end of spreading is not synchronous along the basin.

The most complete set of magnetic anomalies is identified in the central profiles and the best fit is found for anomalies ranging from C5B (15Ma) to C5E (18.7 Ma). The spreading was probably asymmetrical for some periods, being the western part faster than in the eastern part. In the southern profile demagnetisation processes as consequence of late intrusions or tectonic deformations related to the Scotia-Antarctic plate boundary can be involved.

These new ages constraint the opening of the Central Scotia Sea, and they should be taken into account together the age of other small basins in the region, to reconstruct the motion of small continental blocks during the Scotia Arc development. Dove basin opening had to have an important impact in the local recirculation of the water masses in this region of the Scotia Sea, where the voluminous Circumpolar Deep Water interacts with the Weddell Sea Deep Water.