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Morphodynamics of the structural barrier between the Scotia Sea and the Weddell Sea.

Ekaterina Kurbatova and Evgeny Dubinin
Russian Federation (katkakurbatova@gmail.com)

The study area Scotia Sea lies between Antarctica and South America near the Falkland Islands. The structural barrier between the Scotia Sea and the Weddell See represent region with heterogeneous crust and dissected (may be rough) topography. The major part of this barrier is the South Scotia Ridge, which devided South Scotia Sea and North-West Weddell Sea.
Intense deep processes in this area reflect general geodynamic settings of the South Atlantic region. The main processes are strike slip zones and different faults activation, they formed relief‘s contrast as we know at present. There are fault blocks forming the ridge, abyssal plain of the small spreading basins, microcontinental blocks, volcanic Island arc and deep oceanic trenches. However the major type of the relief in the study region can be characterize as tectonical.
Thus Structural barrier between the Scotia and Weddell Seas is a complex system of uplifts and depressions. The occurrence of which is associated with a variety of processes occurring at the boundary of the Scotia and Antarctic plates. We present in this study analysis of the topography and the geodynamic situation of the area, and show the results of analogue experimental modeling.
Compound heterogeneous structure of the barrier between Scotia Sea and Weddell Sea involves Bransfield and Phillip Straits, small basins with ocean crust formed as a result of rotation of microblocks (Powell, Jane, Protector), small pull-apart basins along south boundary of Scotia Plate, South Orkney microcontinent, rises Bruce, Discovery, Pirie, Jane, Irizar. Moreover evolution of the East Scotia Ridge has had an influence on the morphology of the study region.
Bottom topography, distribution of gravity and magnetic anomalies fields show heterogeneity of the crust in the study area. As a result of complicated structure of this region there are a lot of evolutional versions especially for Central Scotia Sea and South Scotia Sea.
Analogue modeling includes two types of experiments: 1) evolutional modeling of the barrier between Scotia and Antarctic plates: 2) detailed modeling of some barrier‘s part. Experiments show that the evolution of the study area constrained by the major plates movement (South American and Antarctic) and evolution of the eastern, western and central parts of the Scotia Sea.