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Ocean bottom pressure and circulation in the South Atlantic

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In order to obtain a better understanding of ocean mass variations and the circulation in the South Atlantic an analysis of ocean bottom pressure (OBP) fluctuations has been performed. For this purpose we utilize a global ocean circulation model and compare the simulated monthly mean OBP anomalies with *in situ* data measured by bottom pressure recorders (e.g. PIES) and data derived from gravity field anomalies provided by the GRACE satellite mission. The ocean model is a 1.5° global version of the 3D Finite Element Sea Ice-Ocean Model (FESOM) which has been developed at the Alfred Wegener Institute for Polar and Marine Research (AWI). *In situ* data of two PIES in the South Atlantic, which were deployed by the AWI in 2002 and recovered in 2005, are available. First results indicate a strong correlation between FESOM and GRACE OBP anomalies on a global and regional scale. On smaller, synoptic scales the correlation weakens. Due to spurious elongated meridional patterns in the monthly gravity field anomalies, gravity fluctuations on a scale less than 1000 km are difficult to detect. Since the *in situ* measurements are point measurements by nature, it is essential to identify the area for which their time series are representative. A spatial cross-correlation analysis of FESOM data indicates that regions of spatially coherent patterns of OBP are separated by features of bottom topography. Averaging GRACE data over these patterns improves agreement with the *in situ* data. Time series of simulated volume transports between the two PIES positions are compared to total ACC transport variations. Furthermore, the representation of the Southern Annular Mode in simulated bottom pressure variations along oceanographic sections, e.g. along the Greenwich Meridian and along a line between Cape Town and the Scotia Sea, is studied.