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# Ocean bottom pressure variability: Which part can be reliably modeled?

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Ocean bottom pressure (OBP) variability serves as a proxy of ocean mass variability, the knowledge of which is needed in geophysical applications. On short time scales a large part of the signal is directly forced by the atmosphere. A question how well we can model the signal by the present general ocean circulation model on time scales beginning from 5 days is addressed here. It is shown that ocean general circulation models simulate consistent patterns of bottom pressure variability on monthly and longer scales except for areas with high mesoscale eddy activity, where high resolution would be required to capture the variability due to eddies. The simulated variability is compared to a new data set obtained with an array of PIES (pressure - inverted echo sounder) gauges deployed along the transect through the Southern Ocean. We present a brief description of PIES data and shown that while the STD of monthly averaged variability agrees well with observations except for the locations with high eddy activity, models lose a significant part of variability on shorter time scales. Furthermore, despite good agreement in the amplitude of variability, the OBP from the PIES and simulation show almost no correlation, albeit both consistently correlate with the atmospheric sea level pressure. Our findings point to limitations in geophysical background models required for space geodetic applications. We argue that major improvements in OBP modelling require data assimilation in order to increase the coherence between modelled and observed signals.