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The Southern Ocean frontal system during the middle Miocene - first results from an innovative modeling study

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The middle to late Miocene glaciation of Antarctica is characterized by abrupt cooling steps and geochemical reorganization in the circum-antarctic realm. Here, we will report first results of a modeling study in which we aim to identify the driving mechanisms behind reconstructed changes in the Southern Ocean frontal system during the late Neogene. For this purpose we employ a global ocean circulation carbon cycle model with a curvilinear grid focussing on the Southern hemisphere; i.e., the Southern Ocean is investigated at higher resolution than the rest of the world. This innovative modeling approach circumvents some typical problems of common models in regional modeling studies, such as the specification of proper boundary conditions if using stand-alone regional models, or the rather coarse resolution of global circulation models.