Improving Future Projections of Antarctica: Observations and Modeling

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New modeling activity is initiated to predict the tipping point for the irreversible Antarctic melting and unstoppable sea level rise in KOPRI. Our goal is to reduce uncertainties and enhance predictability of future sea level rise by improving the ice sheet model by intensifying our understanding on the ice sheet processes and dynamics based on field observations. At first, the impact of high-resolution bed geometry data through airborne radar on the performance of ice sheet model is investigated targeting the David Glacier-Drygalski Ice Tongue, East Antarctica. The 2-dimensional (2-D) shallow shelf approximation model (MacAyeal, 1989), which is implemented in the Ice Sheet System model (ISSM) (Larour et al., 2012) is used. Sensitivity experiments are conducted to verify the significant differences induced by changes in model. A series of projected simulations are compared to explore the role of improved geometry to the grounding line migration, surface mass balance and sea level contribution based on various forcing scenarios including atmospheric forcing, floating ice melting rate, and ice front position.