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C053-07 - Future mass loss of Thwaites Glacier, West Antarctica and its sea level contribution

 Tuesday, 15 December 2020

 21:24 - 21:28

Abstract

The sensitivity to the ocean melt parameterization under ice shelf of future mass loss of Thwaites Glacier, West Antarctica and its sea level contribution is investigated. 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. Linear, PICO(Potsdam Ice-shelf Cavity mOdel), and PICOP(PICO and a plume model) melt parameterizations are implemented and compared. The future projections forced by changes in atmospheric and oceanic forcings based on both idealized and IPCC RCP(Representative Concentration Pathway) scenarios from CMIP5 climate models are carried out upto 2300. For idealized

scenarios, far ocean temperature and salinity are prescribed in certain values, while they come from climate models forced by RCP scenarios in cases of realistic scenarios. The quantitative and qualitative changes in ice velocity, ice mass, and sea level contribution are analyzed and the different characteristics induced by melt parameterizations are compared. PICOP projects more vigorous basal melting and ice mass loss than PICO, but the sea level contribution is not linear to the ice mass loss all the time implying the certain role of ocean properties. It also shows that the changes in regional ice velocity show unique characteristics for each melt parameterization.

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Summa

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