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Projections of the contribution of the Greenland Ice Sheet to sea level rise for the next 100 years

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Results from simulations with a state-of-the-art ice sheet model (Parallel Ice Sheet Model, PISM) for Greenland ice sheet forced with a number of climate forcings for the next century are presented. PISM bridges the gap between the applied SIA ice sheet models and the yet to come "next generation ice sheet models" by implementing a hybrid stress balance scheme, an enthalpy based conservation of energy framework and improved marine ice dynamics. The resolution of the ice sheet model is high enough (2-5km) to resolve the narrow outlet glaciers in Greenland where most of the ice discharge to the ocean occurs. The climate forcings come from the EU FP7 project ice2sea where 3 regional climate models (HIRHAM5, MAR and HadRM3P) were used to dynamically downscale two scenario runs (A1B and E1) from two GCMs (ECHAM5 and HadCM3). This model setup addresses a number of limitations in the sea level rise projections identified in the IPCC AR4. These include the low resolution of the climate forcing and the lack of representation of fast flowing ice streams.