Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Spatial distirbution of Antarctic mass flux due to iceberg transport DARIN COMEAU, ELIZABETH HUNKE, ADRIAN TURNER, Los Alamos National Laboratory — Under a changing climate that sees amplified warming in the polar regions, the stability of the West Antarctic ice sheet and its impact on sea level rise is of great importance. Icebergs are at the interface of the land-ice, ocean, and sea ice systems, and represent approximately half of the mass flux from the Antarctic ice sheet to the ocean. Calved icebergs transport freshwater away from the coast and exchange heat with the ocean, thereby affecting stratification and circulation, with subsequent indirect thermodynamic effects to the sea ice system. Icebergs also dynamically interact with surrounding sea ice pack, as well as serving as nutrient sources for biogeochemical activity. The spatial pattern of these fluxes transported from the continent to the ocean is generally poorly represented in current global climate models. We are implementing an iceberg model into the new Accelerated Climate Model for Energy (ACME) within the MPAS-Seaice model, which uses a variable resolution, unstructured grid framework. This capability will allow for full coupling with the land ice model to inform calving fluxes, and the ocean model for freshwater and heat exchange, giving a complete representation of the iceberg lifecycle and increasing the fidelity of ACME southern cryosphere simulations.

Darin Comeau
Los Alamos National Laboratory

Date submitted: 11 Nov 2016 Electronic form version 1.4