# Antarctic ice-shelf melt and cavity circulation processes in E3SM

Irena Vaňková, Los Alamos National Laboratory | FAnSSIE

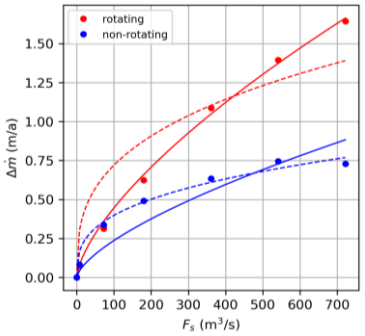
**Goal**: Understand the influence of subglacial discharge on Antarctic melt rates and continental shelf ocean properties

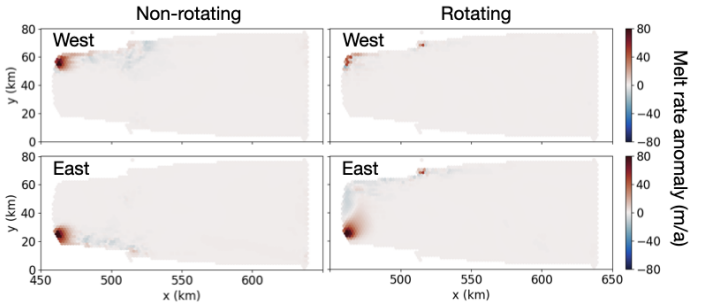
**Results from idealized simulations**:

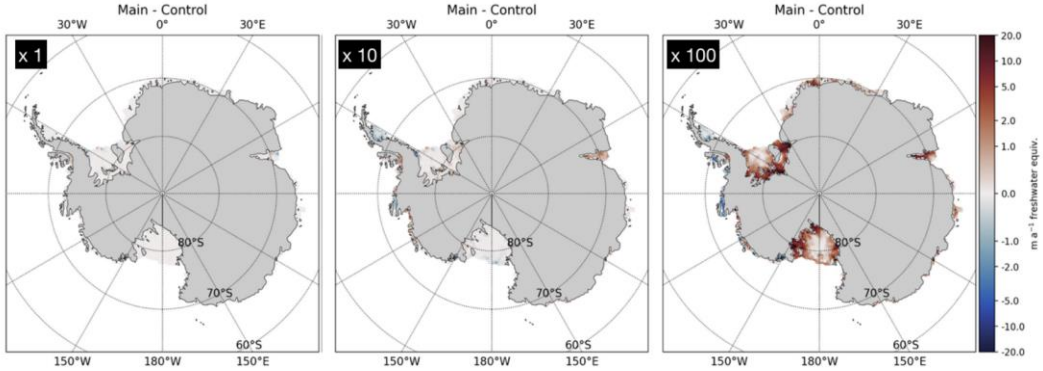
- Melt rate scaling with discharge is stronger than in previously studied non-rotating cases
- Melt-rate response is sensitive to the location of subglacial discharge along the grounding line

**Preliminary results from global simulations**:

- Present-day levels of subglacial discharge result only in relatively minor changes in ice-shelf melt rates and continental shelf properties
- Significant oceanic changes would require at least an order of magnitude stronger subglacial discharge



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**Goal**: Understand resolution effects on heat transport into Antarctic ice-shelf cavities and its effects on basal melting

**Regionally refined configurations**:

- A sequence of global, regionally refined configurations with nominal resolutions of 12, 8, 4, 2, and 1 km in the southern Weddell Sea

**Preliminary results**:

- Basal melt rates near ice stream grounding lines increase with resolution
- Cavity circulation intensifies with resolution