Objectives
Study the seasonal to inter-annual variability of the on-shelf heat transport around Antarctica, its driving mechanisms, and its circumpolar structure.

Approach
- Evaluate model realism (POP2/CiCE4** global 0.1° simulation) using observed water mass structure* along the Antarctic continental slope.
- Calculate the net cross-isobath heat transport (HT) as a function of time, across- and along-isobath distance, and separate HT in its time-mean and eddy components.
- Correlate the variability in HT with wind stress, surface buoyancy fluxes and climate indices (SAM and Niño 3.4).

*Temperature and salinity profiles from animal-borne instruments (Marine mammals Exploring the Oceans Pole-to-pole, MEoP).
**Parallel Ocean Program 2/Community sea-Ice CodE 4.

Impact
1) The data-model comparison demonstrates the usefulness of block-averaged (in time and space) sparsely-available in situ observations as a metric for evaluating model biases (see figure above).
2) The seasonal and inter-annual variability of the mean and eddy circumpolar on-shelf heat transport and its potential drivers are described for the first time in a realistic global model.
3) The convergence of the along-shelf heat transport rivals the ocean-shelf heat exchange (both are in the ~1 TW-10 TW range), highlighting the potential importance of the along-shelf circulation for the Antarctic shelf's heat budget.