Summary of Ocean0_COM_POP2x Results

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1 Model Details

- Model and version: Parallel Ocean Program v. 2x (POP2x)
- Repository: not publicly available.
- Vertical coordinate: z level with partial top and bottom cells.
- Horizontal mixing: harmonic (del2) along geopotentials.
- Vertical mixing: del2 with COM constant viscosity and diffusivity.
- Advection schemes: momentum: centered, tracers: flux limited Lax-Wendroff.
- Equation of state: linear with ISOMIP+ coefficients.
- Convection parameterization: enhanced vertical mixing (ISOMIP+ values of ν_{unstab} and κ_{unstab})
- Melt parameterization: T_w and S_w are computed by averaging T and S with 20 m of the ice draft. u_w is averaged over 4 "horizontal" neighbors (at the ice–ocean interface) from the velocity to the tracer grid but is not averaged vertically.
- Modifications to Topography: Interpolated to 2-km grid with conservative interpolation scheme, smoothed with a Gaussian filter with half-width of 2 km. A minimum thickness of 2 grid cells (40 m) was maintained by deepening bathymetry near the grounding line. Partial top cells thinner than 5 m are either thickened or removed. Ice draft and bathymetry are automatically adjusted to ensure required connectivity between neighboring cells (e.g.removing or horizontally expanding cells with no horizontal neighbors).
- Maintaining sea level: Using virtual salt fluxes, so sea-level change is negligible.
- Deviations from COM: none.
- Parameter values:

Γ_T	0.11
Γ_S	3.14286×10^{-3}
$C_{D,\text{top}}$	2.5×10^{-3}

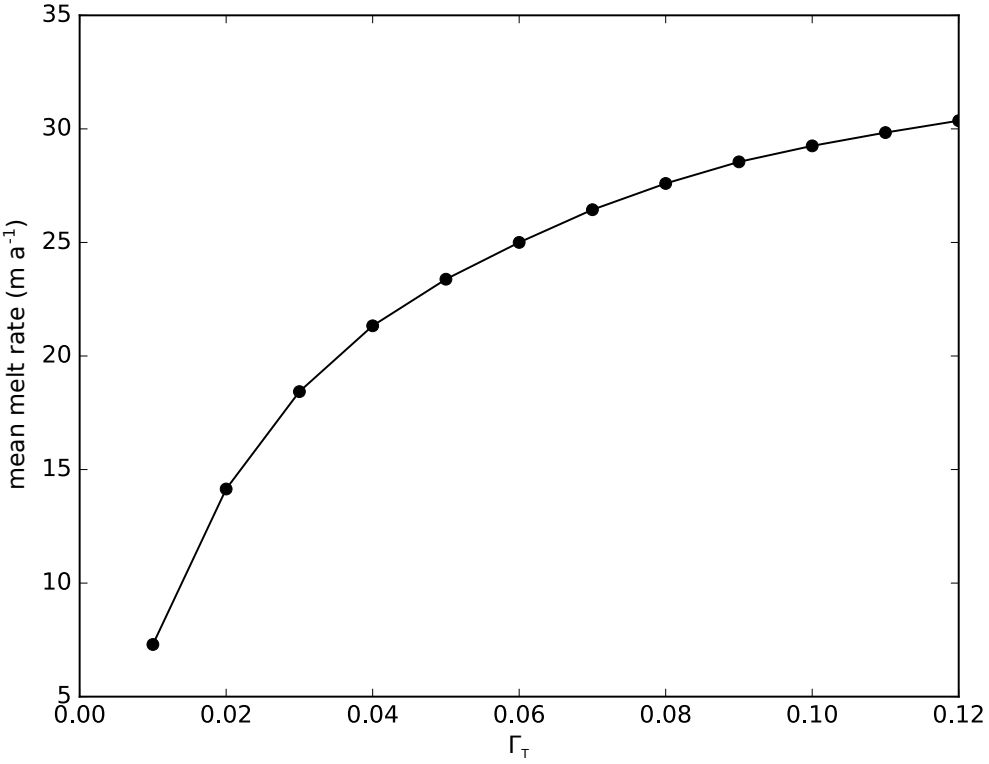

Figure 1: The dependence of the mean melt rate averaged over locations below $z_d = -300\,\mathrm{m}$ and over the final six months of the simulation for various values of the turbulent heat-transfer coefficient Γ_T. Based on these results, the value $\Gamma_T \approx 0.11$, corresponding to a mean melt rate $m_w \approx 30\,\mathrm{m\,a^{-1}}$, was used for subsequent ISOMIP+ and MISOMIP1 simulations.