Rencontre du non-linéaire 2023

Vertical structure of buoyancy transport by ocean baroclinic turbulence

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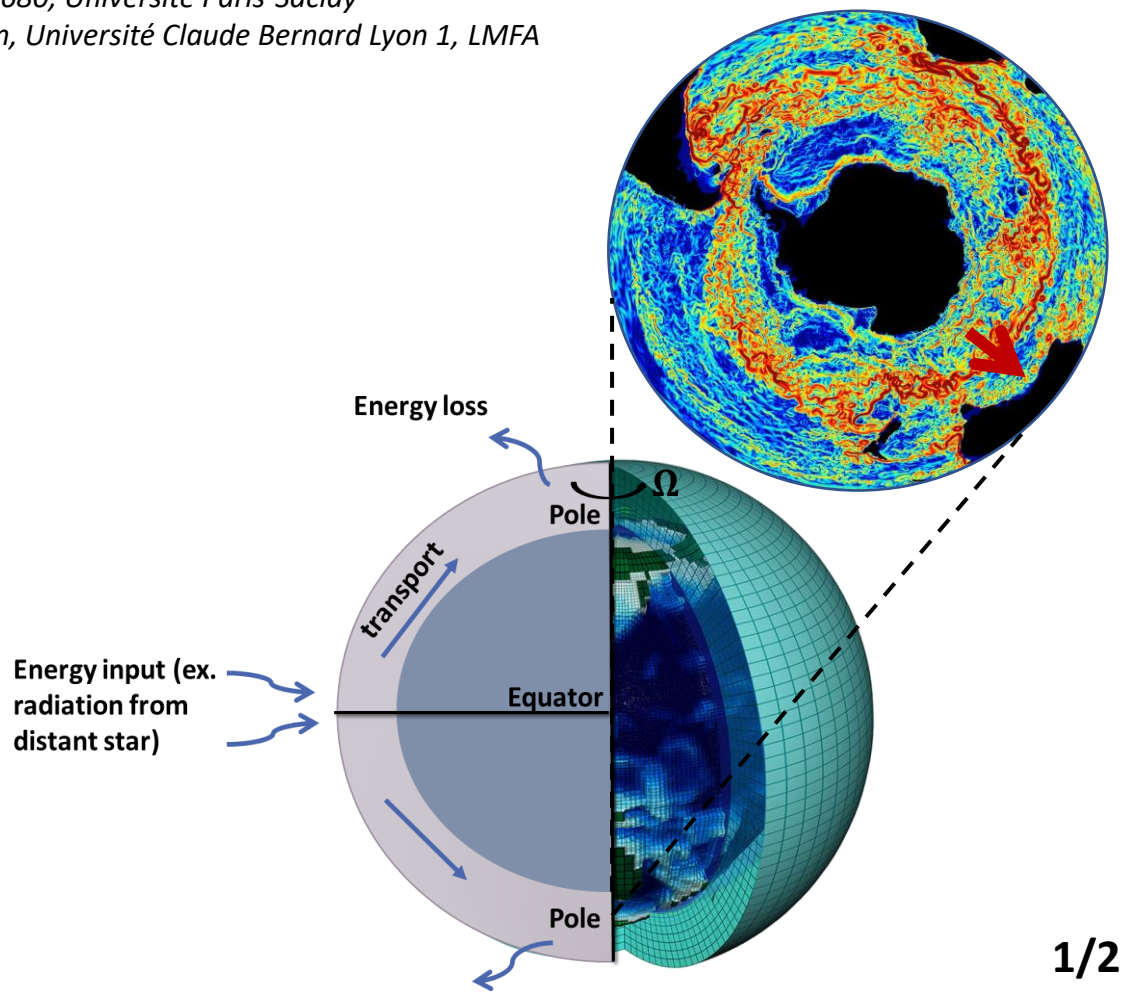
- **Ocean baroclinic instability transports heat from the equator to the poles**
- **Forms mesoscale turbulent structures (20-80km)**
- **Associated heat transport has to be parameterized for Global Climate Models (coarser grid)**

Physically-based parametrization of heat fluxes

- Amplitude
- Vertical structure

From Patara et al. GRL 2016



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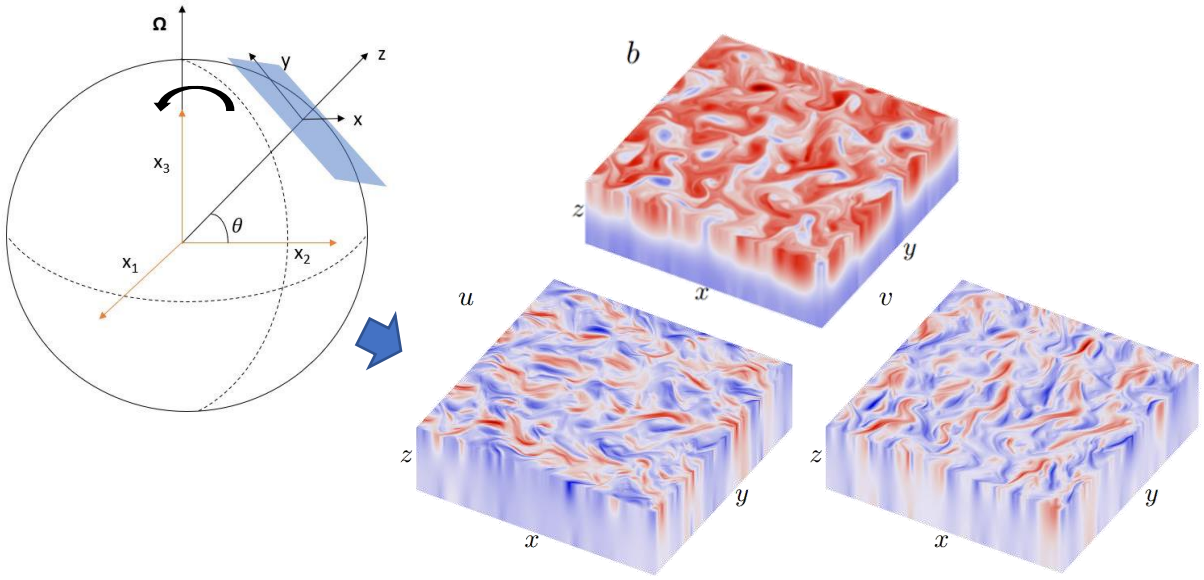
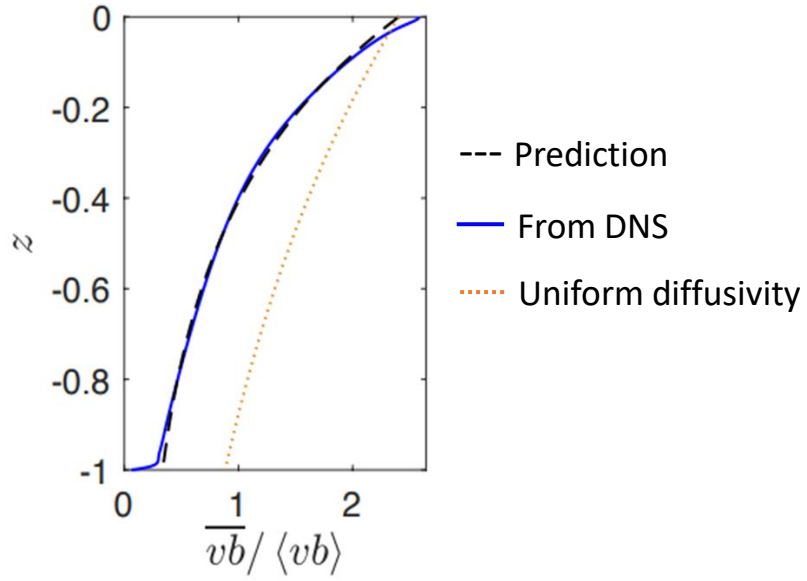
1. **Scale separation ⟹ effective diffusivity linking fluxes and background gradients**
2. **Find additional constraints on effective diffusivity**
3. **Solve for the vertical structure of the heat flux**



4. Compare to DNS of a patch of ocean



Prediction of heat flux vertical dependence