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Dynamics of grounded meridional abyssal flow.

On the planetary scale, Earth's ocean circulation is composed of the wind-driven surface-intensified currents that transport warm equatorial water toward the Polar Regions and the buoyancy-driven deep or abyssal currents that transport cold/dense water produced by atmospheric cooling in the high latitudes back toward the equator and beyond. This circulation pattern corresponds to the global scale convective overturning of the oceans. From the perspective of climate dynamics, this large scale flow plays an important role in how equatorial heat is transported poleward. In this talk I will try to explain the underlying dynamical balances at play in the meridional flow of grounded abyssal currents including source-driven equatorward flow (Stommel-Arons dynamics), topographic-steered geostrophic flow (Nof dynamics), baroclinic instability and western intensification (planetary shock-wave balance) within the context of multilayer shallow water theory. (Received September 14, 2007)