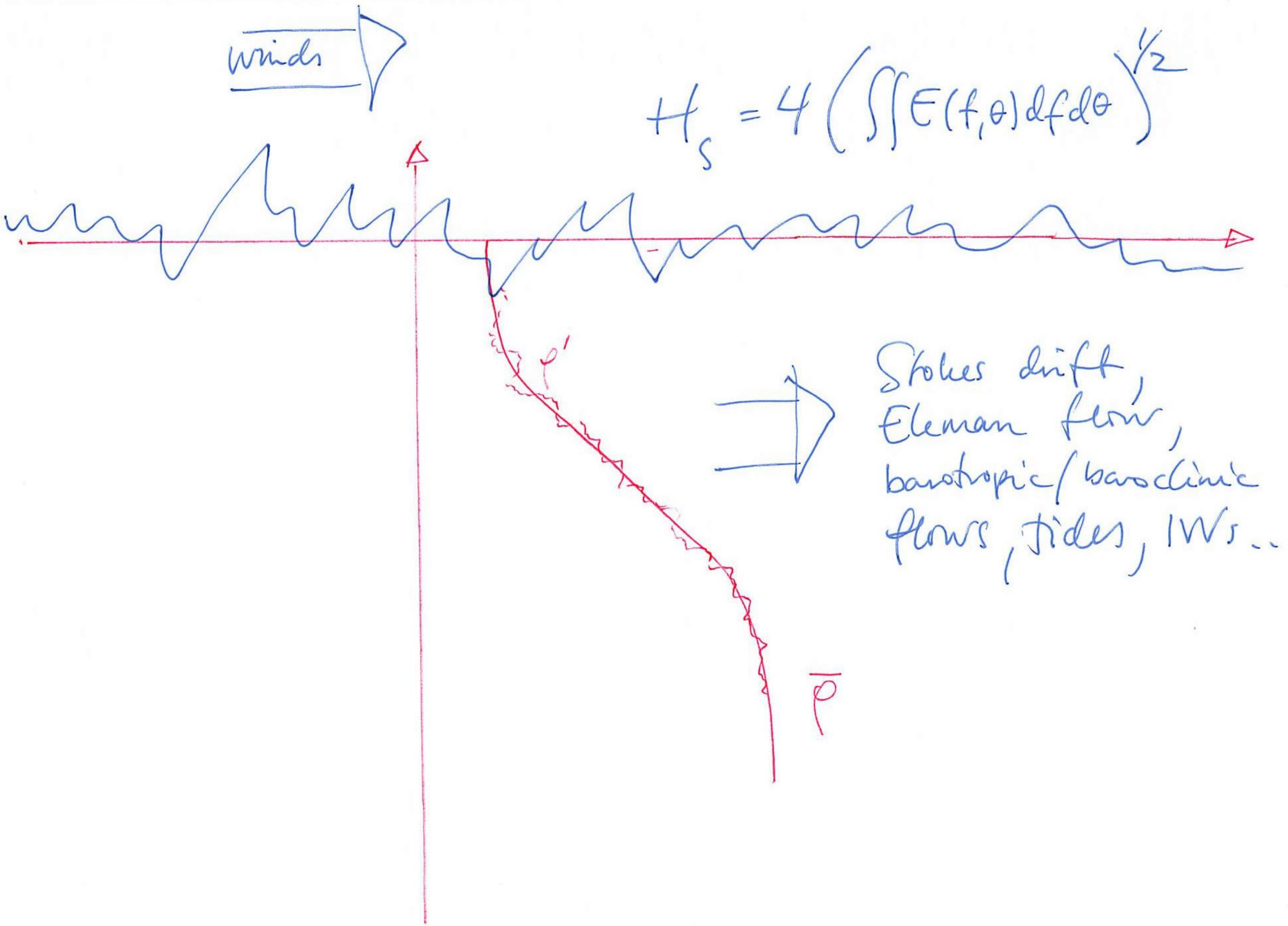
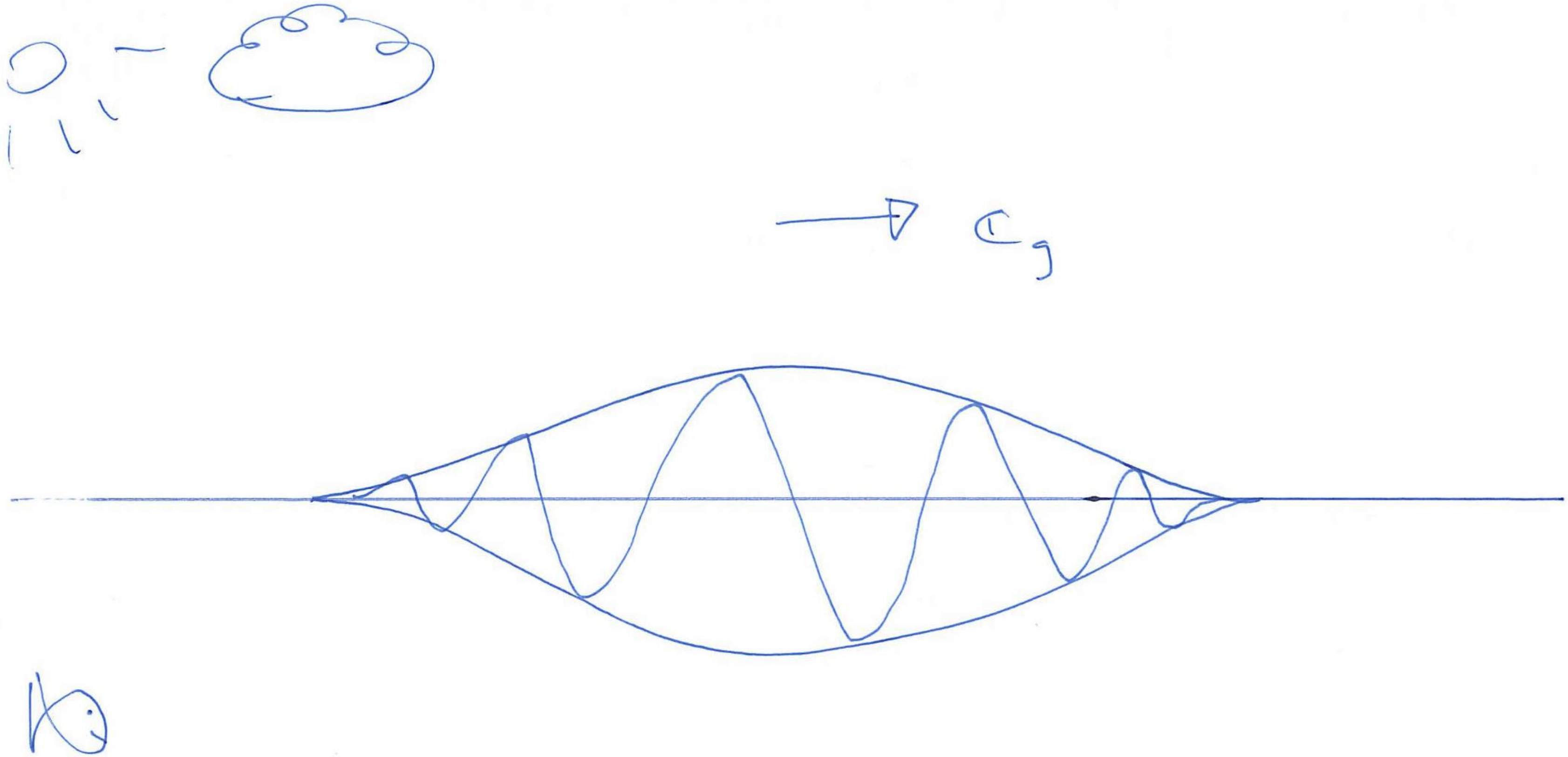
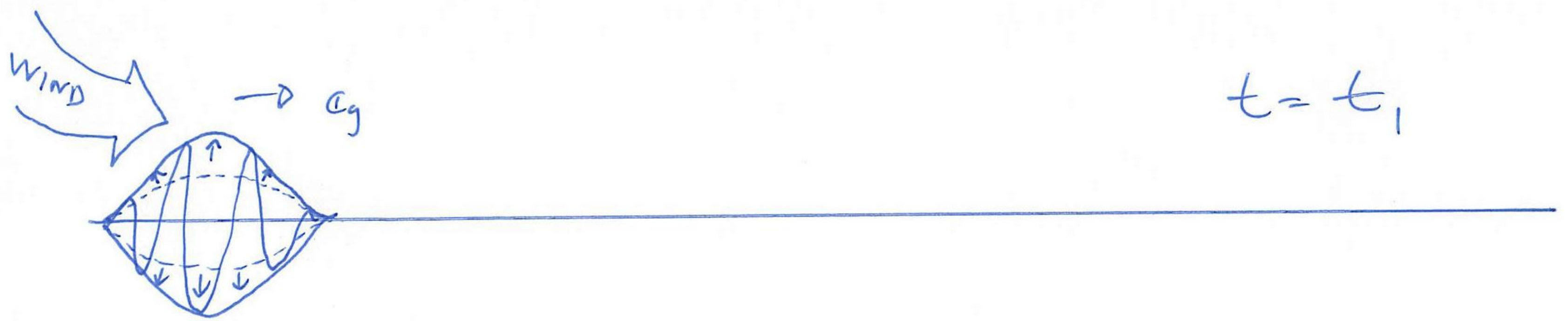
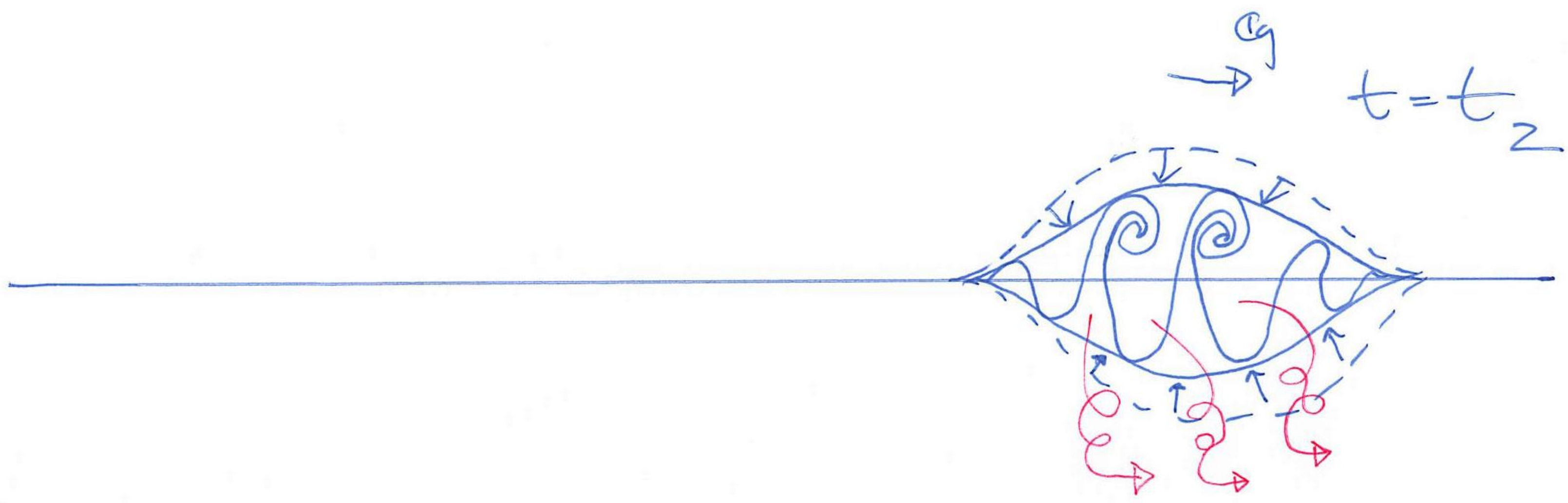
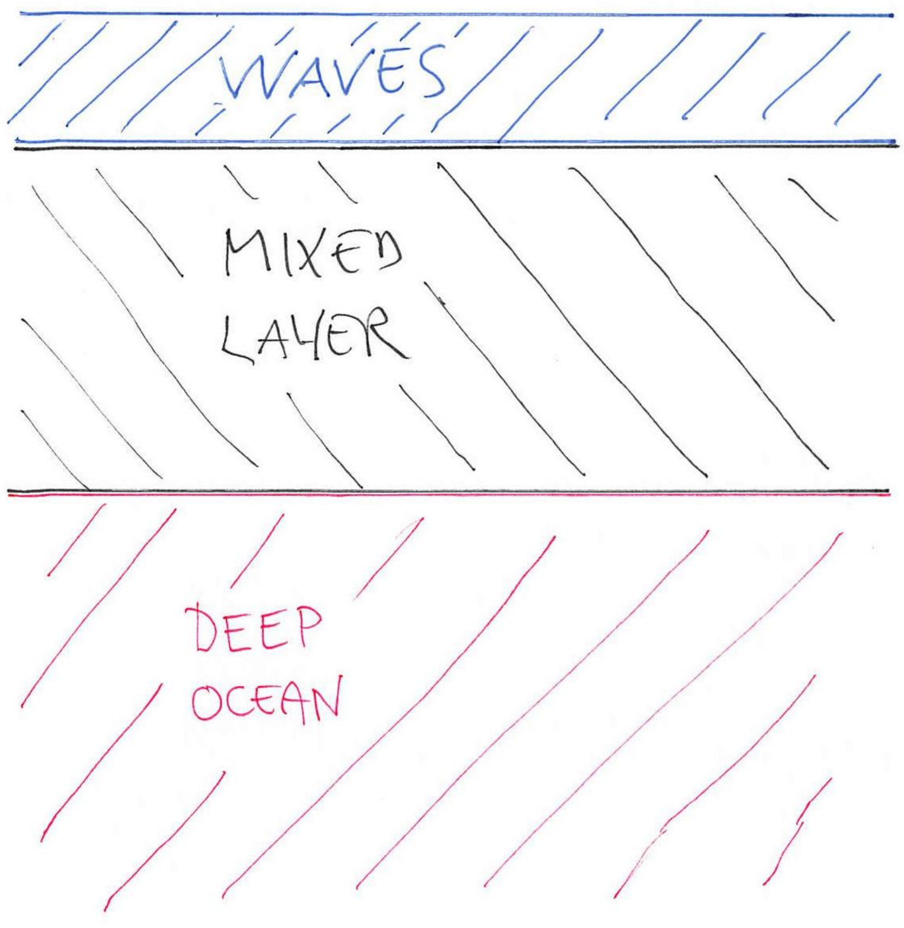


winds
$H_s = 4\left(\iint E(f,\theta)\,df\,d\theta\right)^{1/2}$
ρ'
Stokes drift,
Ekman flow,
barotropic/baroclinic
flows, tides, IWs...
$\bar{\rho}$


c_g

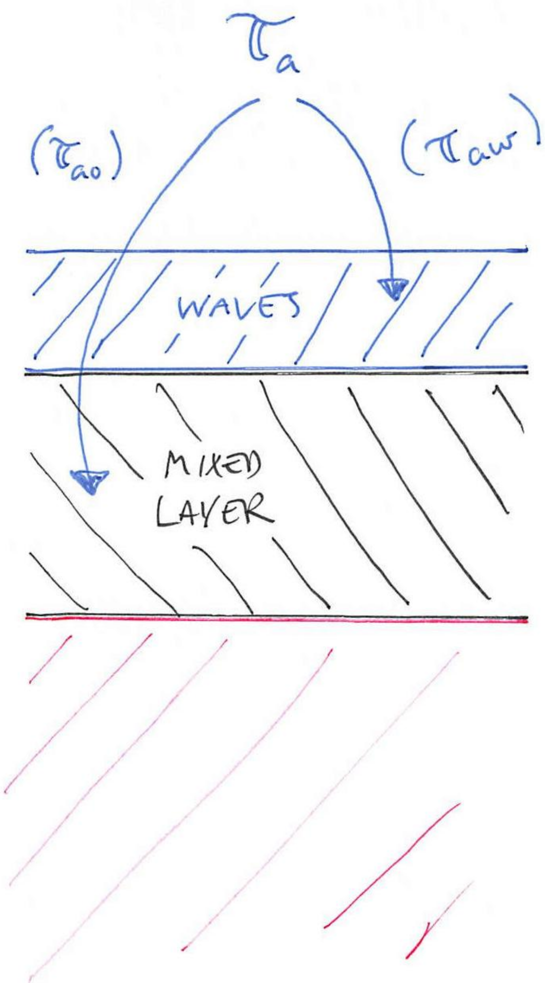

WIND
c_g
$t = t_1$


c_g
$t = t_2$



$$U_S = \int u_S \, dz$$

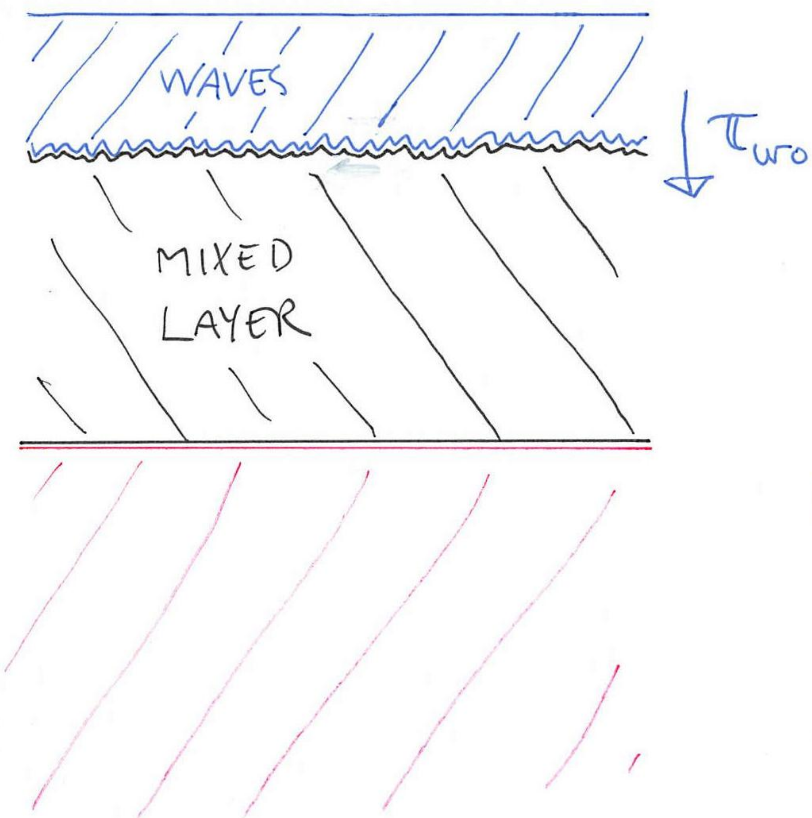
$$U_E = \int \overline{u} \, dz$$



$$\frac{\partial M_w}{\partial t} = \frac{\partial}{\partial t}(\rho U_s) > 0$$

$$\frac{\partial M_E}{\partial t} = \frac{\partial}{\partial t}(\rho U_E) > 0$$

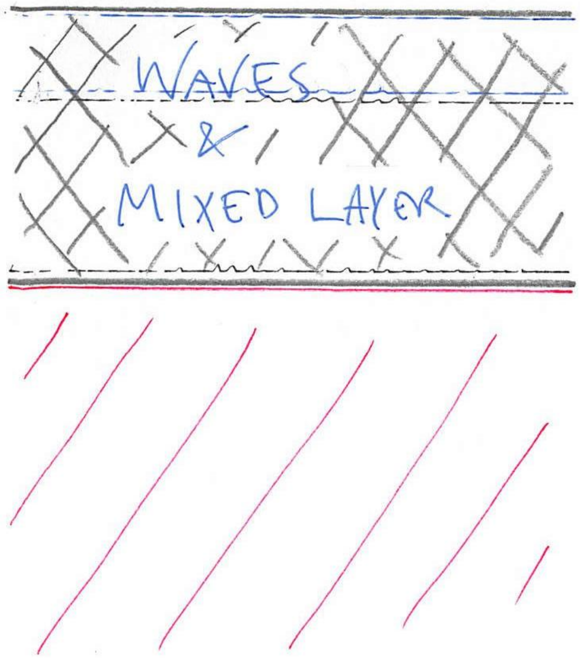
ATMOSPHERIC FORCING,
NO WAVE DISSIPATION.



$$\frac{\partial \mathbb{M}_w}{\partial t} < 0$$

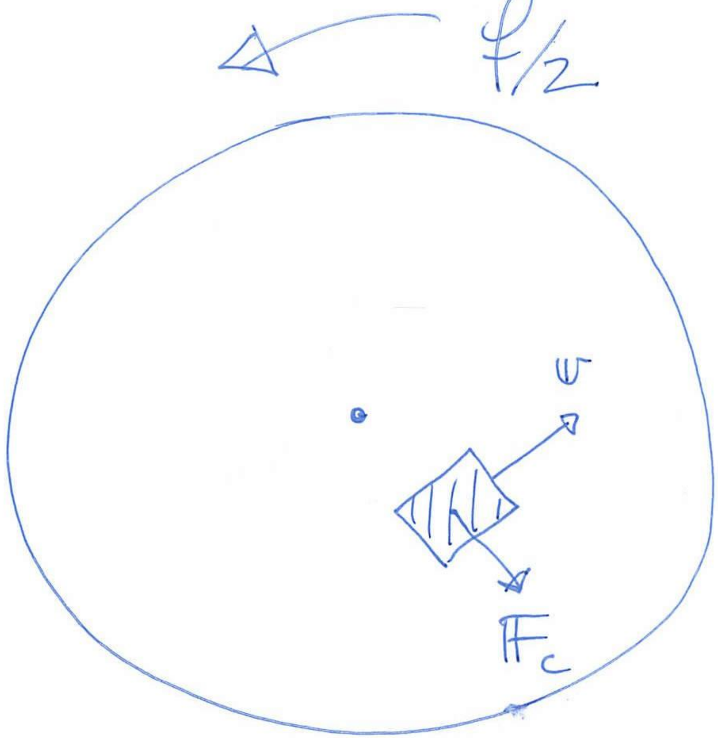
$$\frac{\partial \mathbb{M}_E}{\partial t} > 0$$

NO ATMOSPHERIC FORCING,
WAVE DISSIPATION

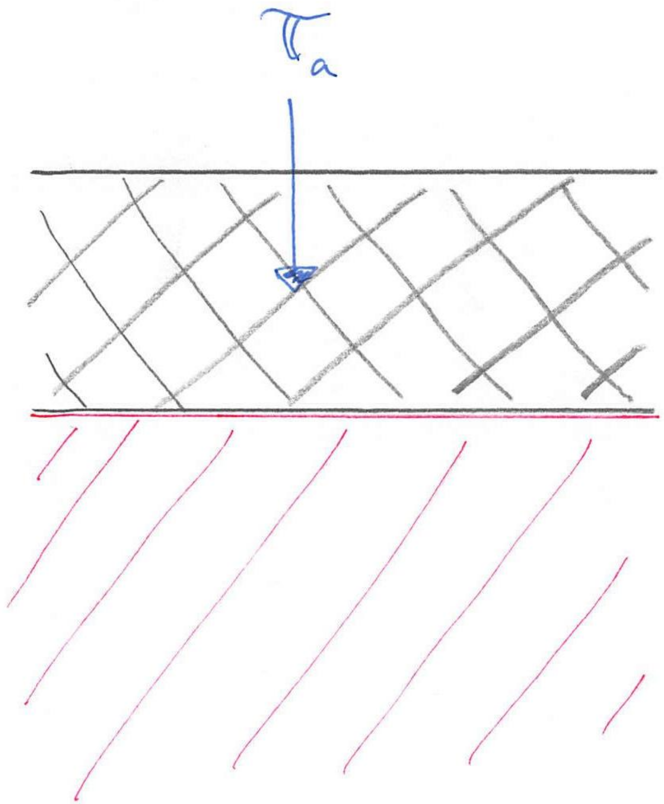


$$\mathbb{M}_W + \mathbb{M}_E = \mathbb{M}_L$$

ROTATING OCEAN



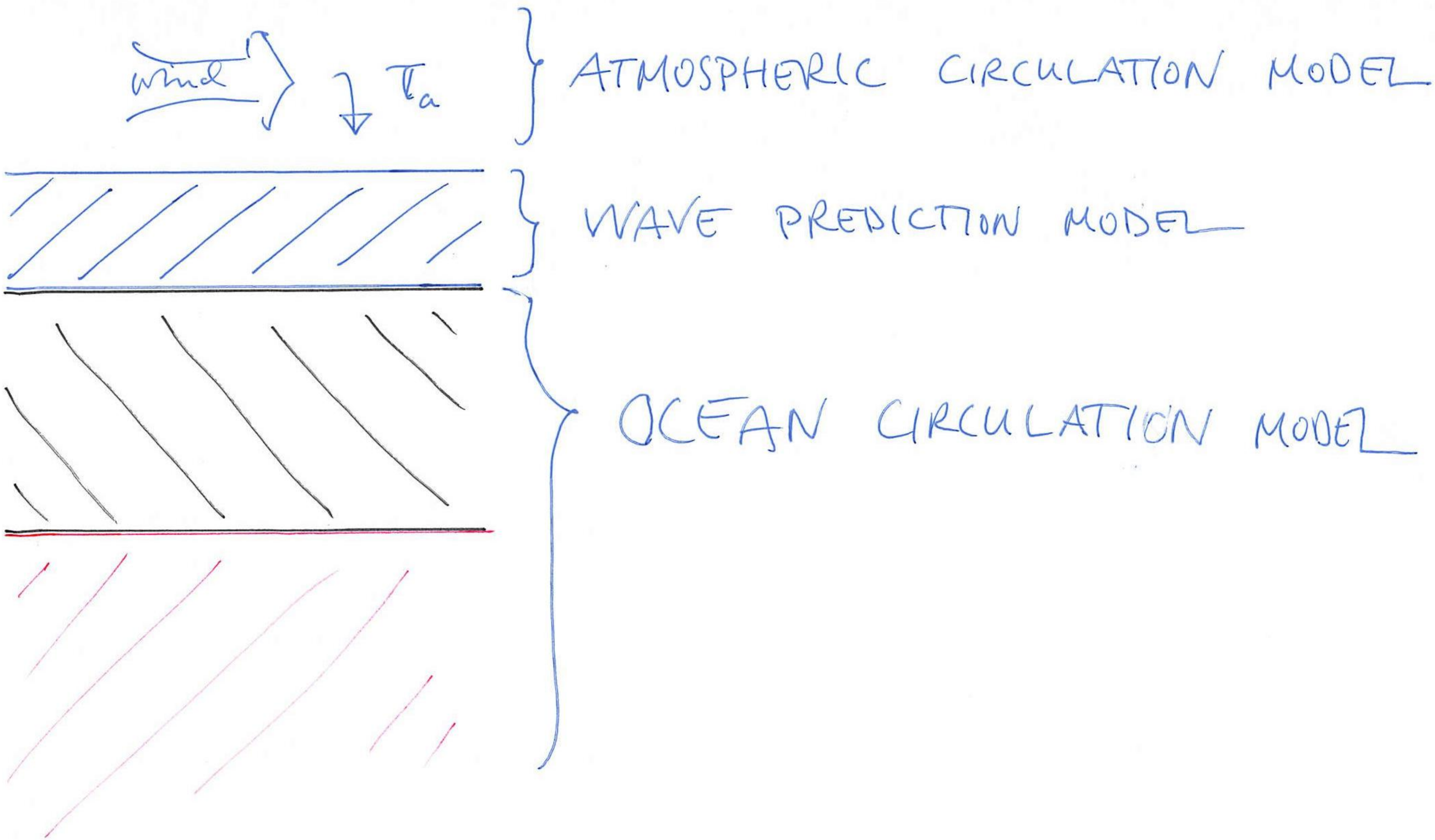
$$\frac{\partial \mathbf{v}}{\partial t} = f\mathbf{k} \times \mathbf{v}$$

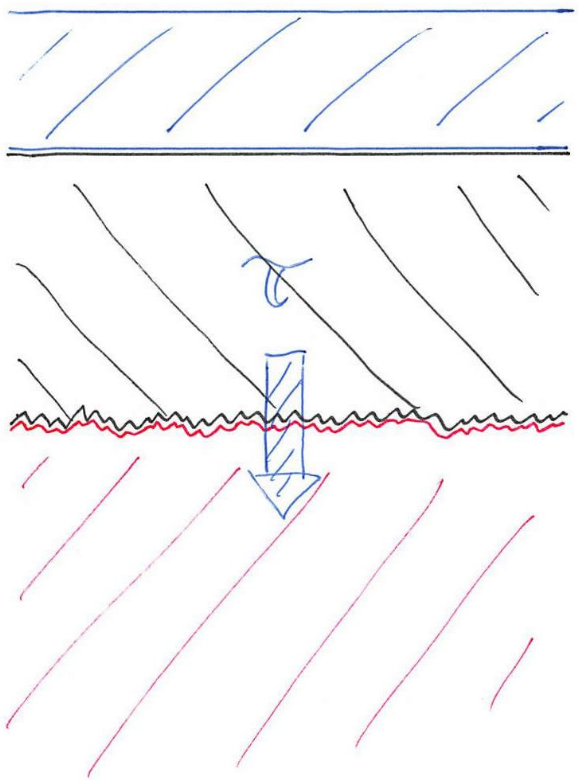


ROTATING OCEAN

$$\frac{\partial \mathbb{M}_L}{\partial t} = f \mathbb{k} \times \mathbb{M}_L + \tau_a$$

If $\tau_a = 0$ we get inertial oscillations in a Lagrangian sense.


wind
τ_a
ATMOSPHERIC CIRCULATION MODEL
WAVE PREDICTION MODEL
OCEAN CIRCULATION MODEL



UPPER OCEAN LOSING MOMENTUM E.G. THROUGH GENERATION OF NEAR INERTIAL WAVES