Rossby Wave Eq. (same as before)

$$\frac{\partial_{1}}{\partial t} - \frac{\mathbf{R}^{2}}{\partial t} \frac{\partial}{\partial x^{2}} \left( \frac{\partial^{2}_{1}}{\partial x^{2}} + \frac{\partial^{2}_{1}}{\partial y^{2}} \right) - \beta_{0} \mathbf{a}^{2} \frac{\partial}{\partial x} = 0$$

$$\frac{1}{2}\omega - R^2 \left(\frac{1}{2}\omega\right)\left[\left(il^2\right)^2 + \left(im^2\right)^2\right] - \beta_0 R^2 il = 0$$

Rossby
Wave
Dispersion
$$\omega \left[1-\mathbf{Q}^{2}_{(-)}(\ell^{2}+m^{2})\right] + \beta \cdot \mathbf{Q}^{2} \ell$$

$$\omega = -\beta \cdot \mathbf{Q}^{2} \ell$$

$$1+\mathbf{Q}^{2}(\ell^{2}+m^{2})$$

$$\frac{-\beta_{0}l}{a^{-2}+(l^{2}+m^{2})} = \frac{-\beta_{0}l}{a^{-2}+l^{2}}$$

$$C_{X} = \omega = -\beta_{o} Q^{2}$$

$$\ell = \frac{1 + Q^{2} (\ell_{+\mu}^{2})}{\ell_{-\mu}^{2}}$$

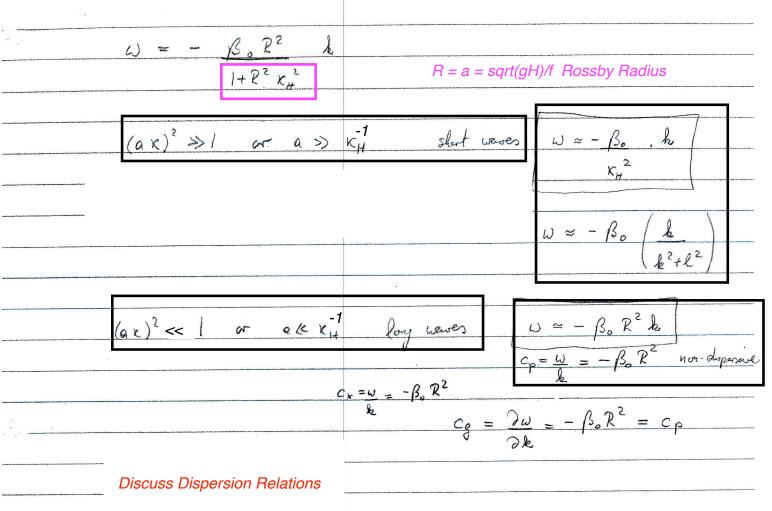
always negative
that is westward place
propagation ALWAYS

fastist possible phase speed for 
$$(\mathbf{Q}^{2}\mathbf{K}_{H})^{2}$$
 «  $\mathbf{I}$  or  $\mathbf{Q}^{2}$   $\mathbf{K}_{H}^{-2}$  long waves

$$C_{max} = -\beta_0 Q^2 = -\beta_0 gH son parallel = 10 m/s in 1000 m of where for 25 R sixty$$

$$\beta_0 = 2.2 \cos \phi = \frac{7.292 \cdot 2 \cdot \cos \phi}{6300 \cdot 10^3 \text{ m/s}} \approx \frac{f_0}{6 \times 10^6} \approx \frac{10^{-11} \text{ m/s}^{-1}}{10^{-11} \text{ m/s}^{-1}}$$

$$\frac{\beta_{o}}{f_{o}^{2}} = \frac{10^{-4} \text{ m}^{-1} \text{ s}^{-1}}{10^{-3} \text{ m}^{-1} \text{ s}} = \frac{10^{-3} \text{ m}^{-1} \text{ s}}{10^{-4} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-1} \text{ s} \cdot 10^{4} \text{ m}^{2} \text{ s}^{-2}}{10^{-8} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-1} \text{ s} \cdot 10^{4} \text{ m}^{2} \text{ s}^{-2}}{10^{-3} \text{ m}^{-1} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-1} \text{ s} \cdot 10^{4} \text{ m}^{2} \text{ s}^{-2}}{10^{-3} \text{ m}^{-2} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-2} \text{ s}^{-2}}{10^{-3} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-2}}{10^{-3} \text{ s}^{-2}} = \frac{10^{-3} \text{ m}^{-2}}$$



- 1. All Rossby waves propagate their phase to the West;
- 2. Mexican Hat for omega=omega(k,l)
- 3. omega=omega(k,l=0)
- 4. For each frequency omega, there exists both a short and a long wave;
- 5. Long waves are non-dispersive, i.e., phase velocity is the same for all such waves;
- 6. Short waves are dispersive, i.e., phase velocity varies with wave numbers;
- 7. A maximal frequency exists at which the eastward component of the group velocity is zero;
- 8. Long waves propagate their energy to the West (negative group velocity);
- 9. Short waves propagate their energy to the East (positive group velocity);
- 10. Group and phase velocities can always have components to the North or South.