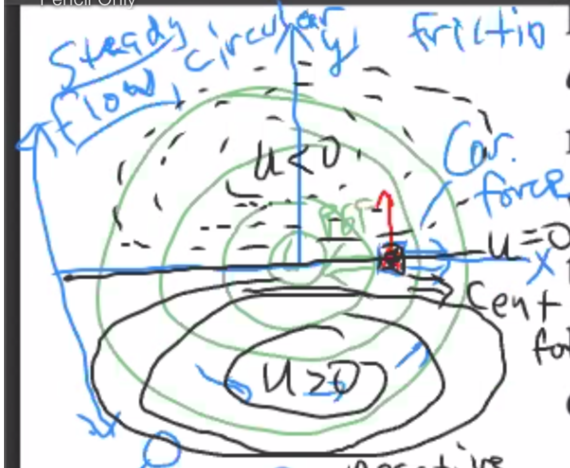


parcels as they move downstream. Hence, when $d\mathbf{V}/dt$ is large, its scalar magnitude can be approximated by the centripetal acceleration V^2/R_T, where R_T is the local radius of curvature of the air trajectories.[8] Hence, the horizontal equation of motion reduces to the balance of forces in the direction transverse to the flow, i.e.,

$$\frac{\partial u}{\partial t} + \frac{\partial u}{\partial x}u + \frac{\partial u}{\partial y}v = -\frac{\partial \Phi}{\partial x} + fv$$

$$\frac{V^2}{R_T} = -\boxed{\nabla\Phi} - \boxed{f\mathbf{k} \times \mathbf{V}} \tag{7.16}$$

u=0 at point , v>0 , $\frac{\partial u}{\partial y} < 0$

advection of u is positive there.
"centrifugal force" is to the right

The signs of the terms in this three-way balance depend on whether the curvature of the trajectories is cyclonic or anticyclonic, as illustrated in Fig. 7.12. In the cyclonic case, the outward centrifugal force (the mirror image of the centripetal acceleration) reinforces the Coriolis force so that a balance can be

and so... Fig. 7.12... fied as po... tive if th... anticyclo...

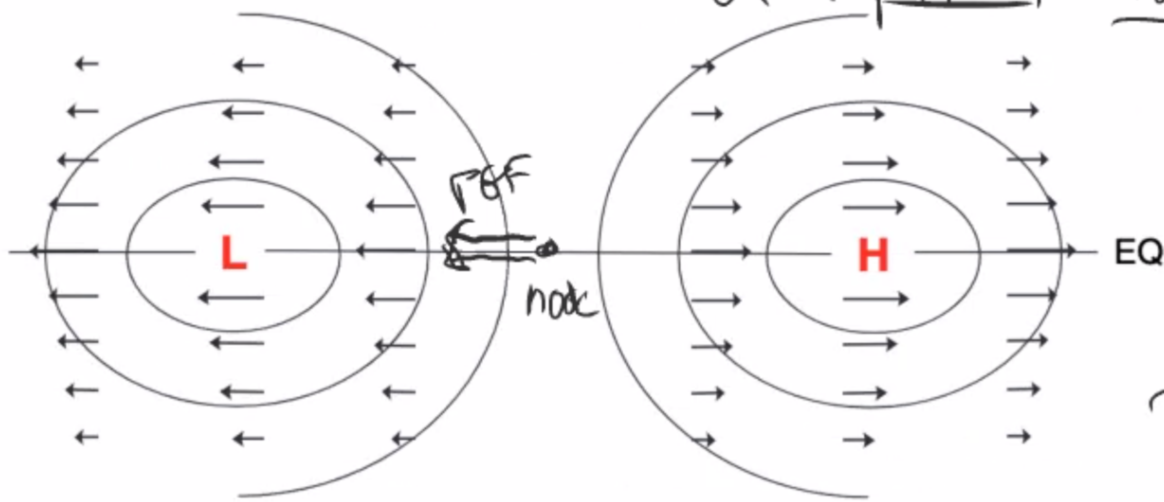
7.2.7 T...

Just as th... ship to ∇... bears a ... geostroph... sure surf...

(sinusoidal) (wave)

"Propagation" - motion of a pattern not due to "transport".

$$\boxed{\frac{\partial u}{\partial t} = -\frac{\partial \Phi}{\partial x}} + \cancel{fv = 0}$$



At node point, PGF is westward and unopposed.

Therefore, $\frac{\partial u}{\partial t} < 0$.

The wind becomes more like the part of the pattern to its west

Thus, pattern propagates eastward.

Fig. 7.31 Distribution of wind and geopotential height on a pressure surface in an equatorial Kelvin wave in a coordinate system moving with the wave.

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Hypothesis - Web & PDF Annotation | chrome-extension://bjfhmglciegochdpefhhlphglcehb...

Pencil Only 310 (40 of 42) 240%

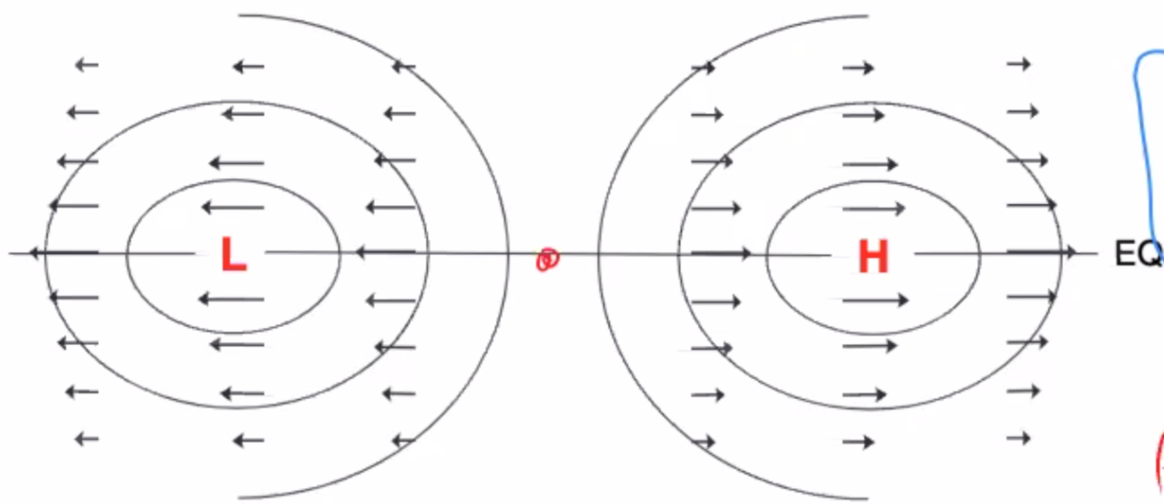


Fig. 7.31 Distribution of wind and geopotential height on a pressure surface in an equatorial Kelvin wave in a coordinate system moving with the wave.

How about height pattern?

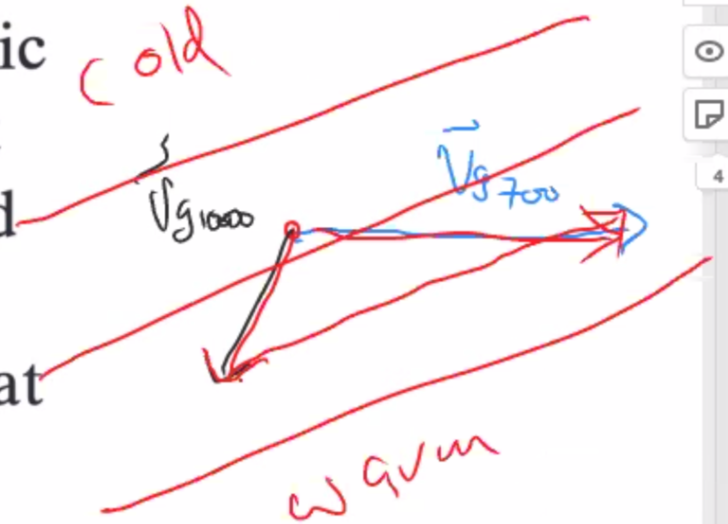
where wind converges (di), height rises. (falls)

At nodal point, winds diverge, height tendency is negative.

the Low moves east

Pen Highlighter Line Arrow Rectangle Oval Text Color Eraser Undo Redo Clear

At a certain station, the 1000-hPa geostrophic wind is blowing from the northeast (050°) at 10 m s^{-1} while the 700-hPa geostrophic wind is blowing from the west (270°) at 30 m s^{-1}. Subsidence is producing adiabatic warming at a rate of 3 °C day^{-1} in the 1000 to 700-hPa layer and diabatic heating is negligible.



$$\frac{\partial T}{\partial t} = \underbrace{\text{hor. adv. of } T}_{\boxed{-\vec{V}\cdot\vec{\nabla}T}} + \underbrace{(\text{subsidence warming})}_{\boxed{3^\circ C/d}} + \cancel{\text{diabatic heating}}^{\,0}$$

have need, from $\vec{V}_T$

$$\boxed{V_T \cdot \nabla T = 0}$$