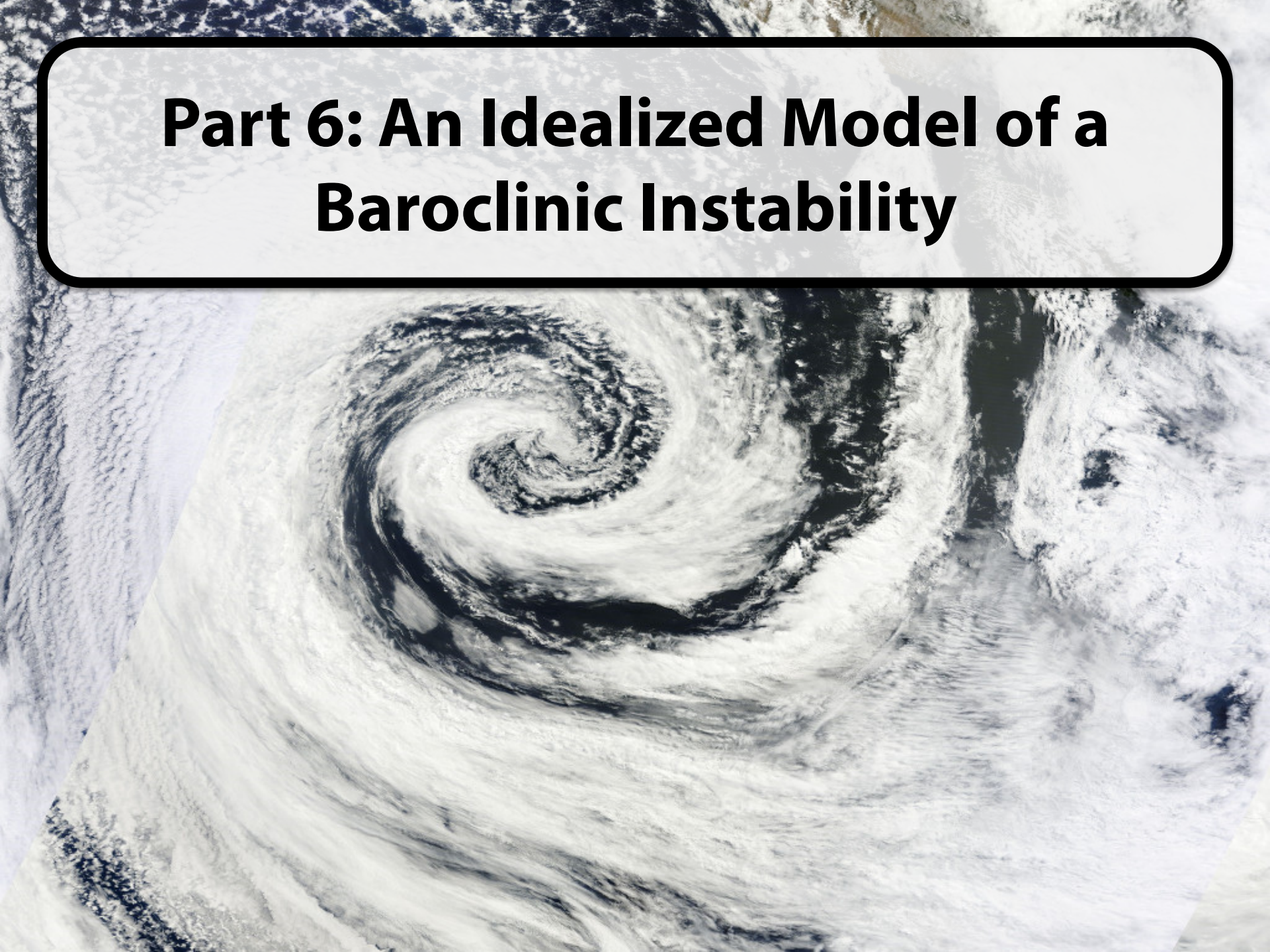


Quasi-Geostrophic Theory

Chapter 4

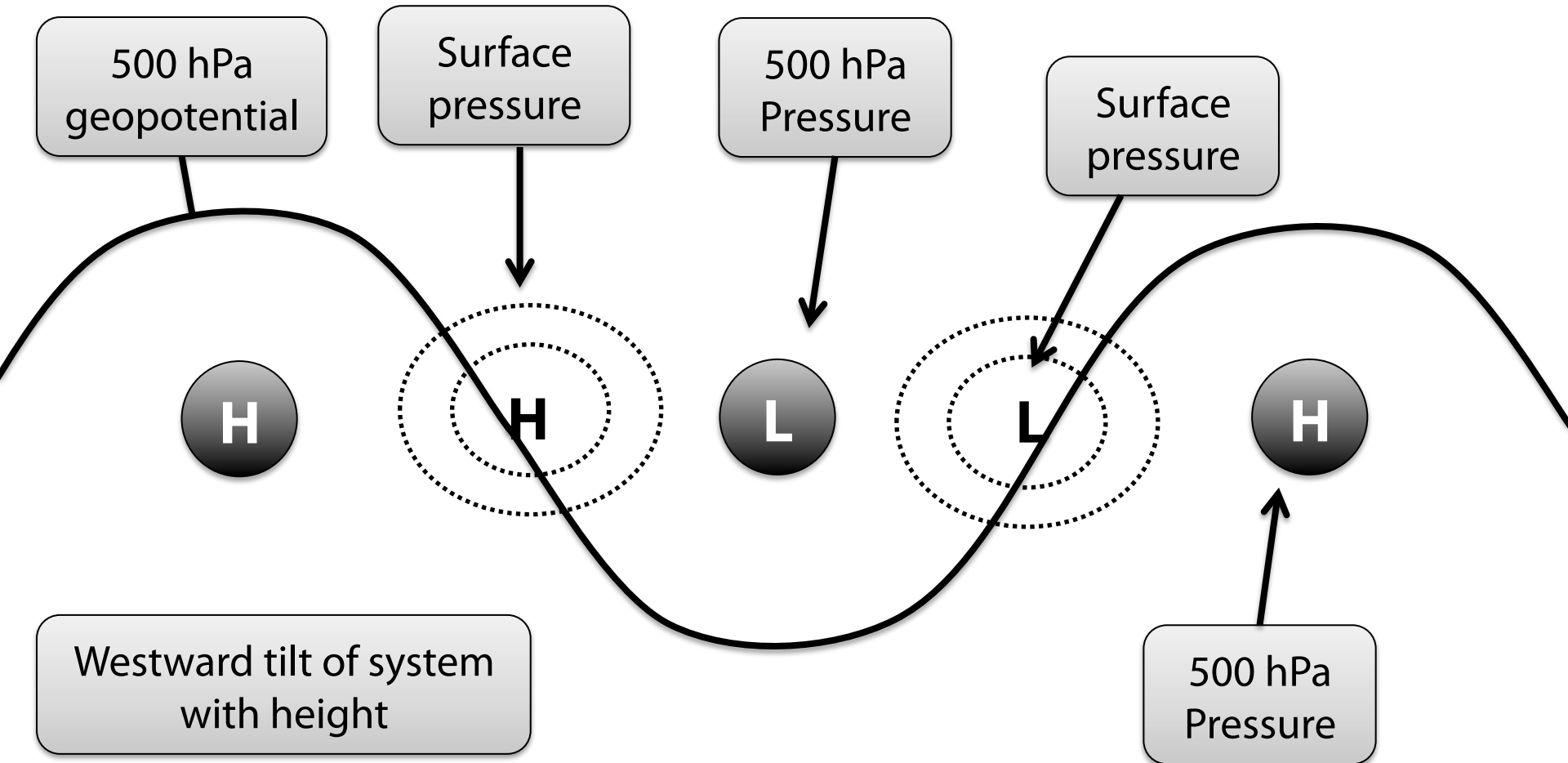
Paul A. Ullrich
paulrich@ucdavis.edu

Part 6: An Idealized Model of a Baroclinic Instability



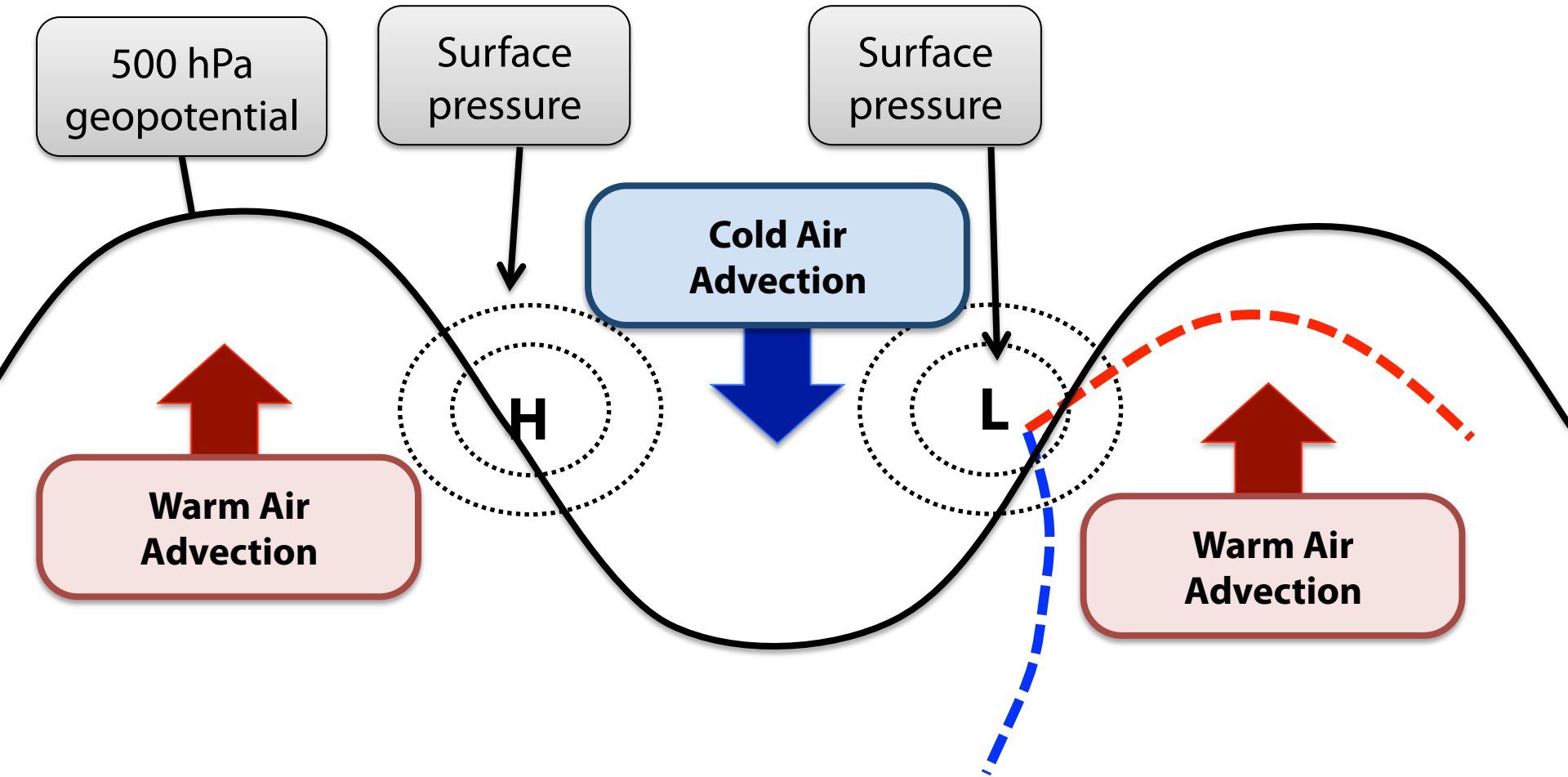
QG Baroclinic Disturbance

Northern Hemisphere



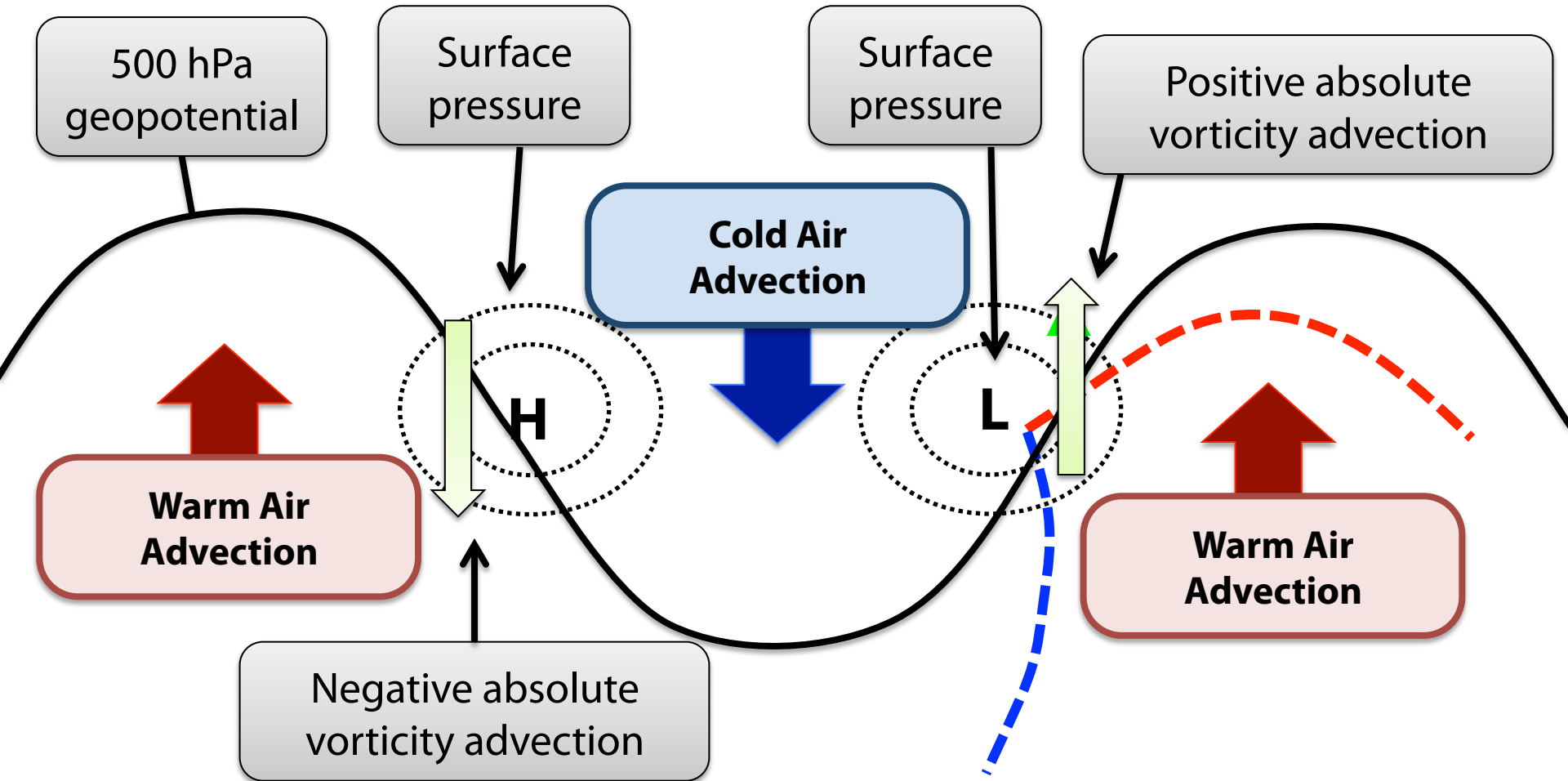
QG Baroclinic Disturbance

Northern Hemisphere



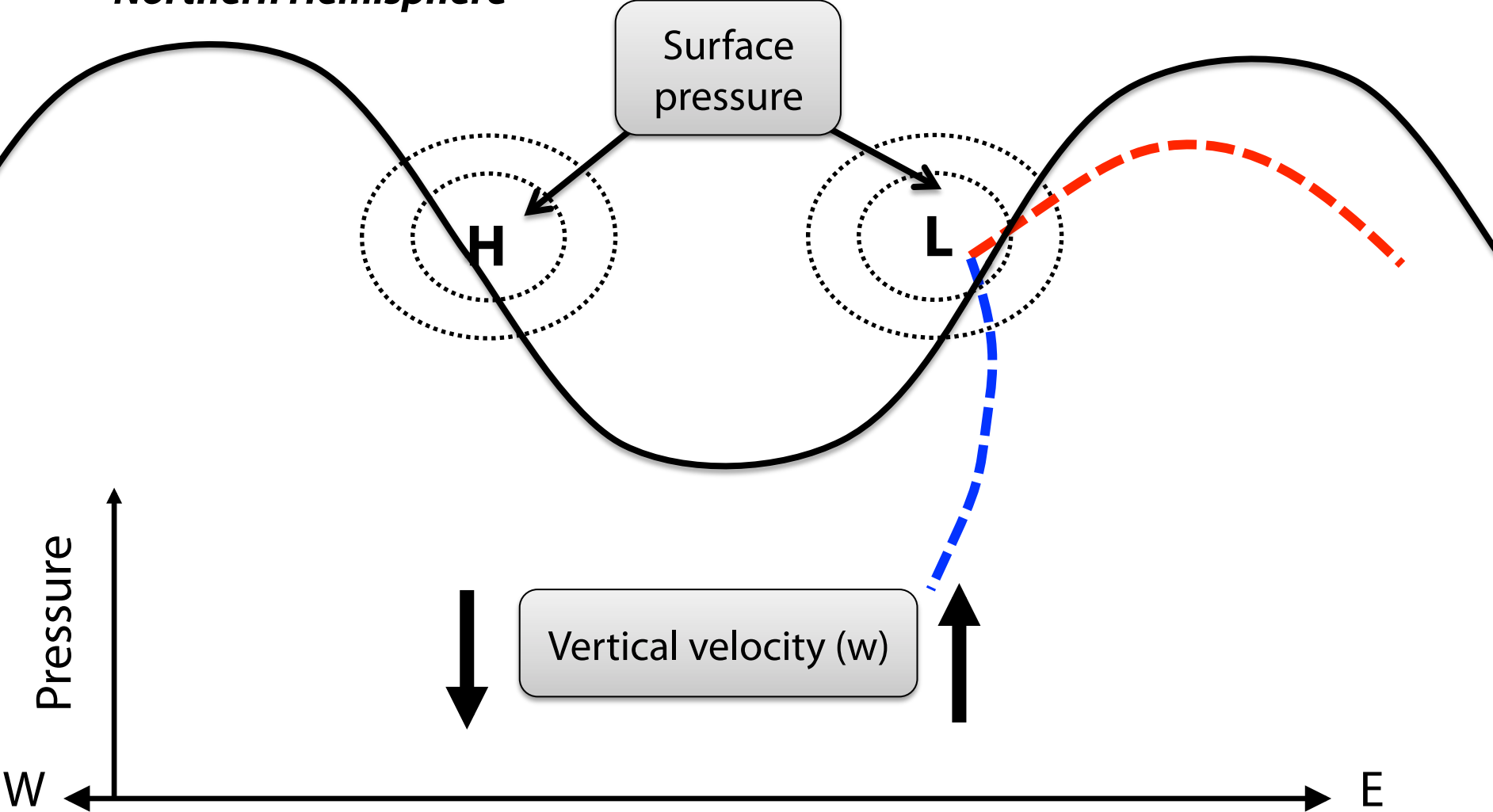
QG Baroclinic Disturbance

Northern Hemisphere

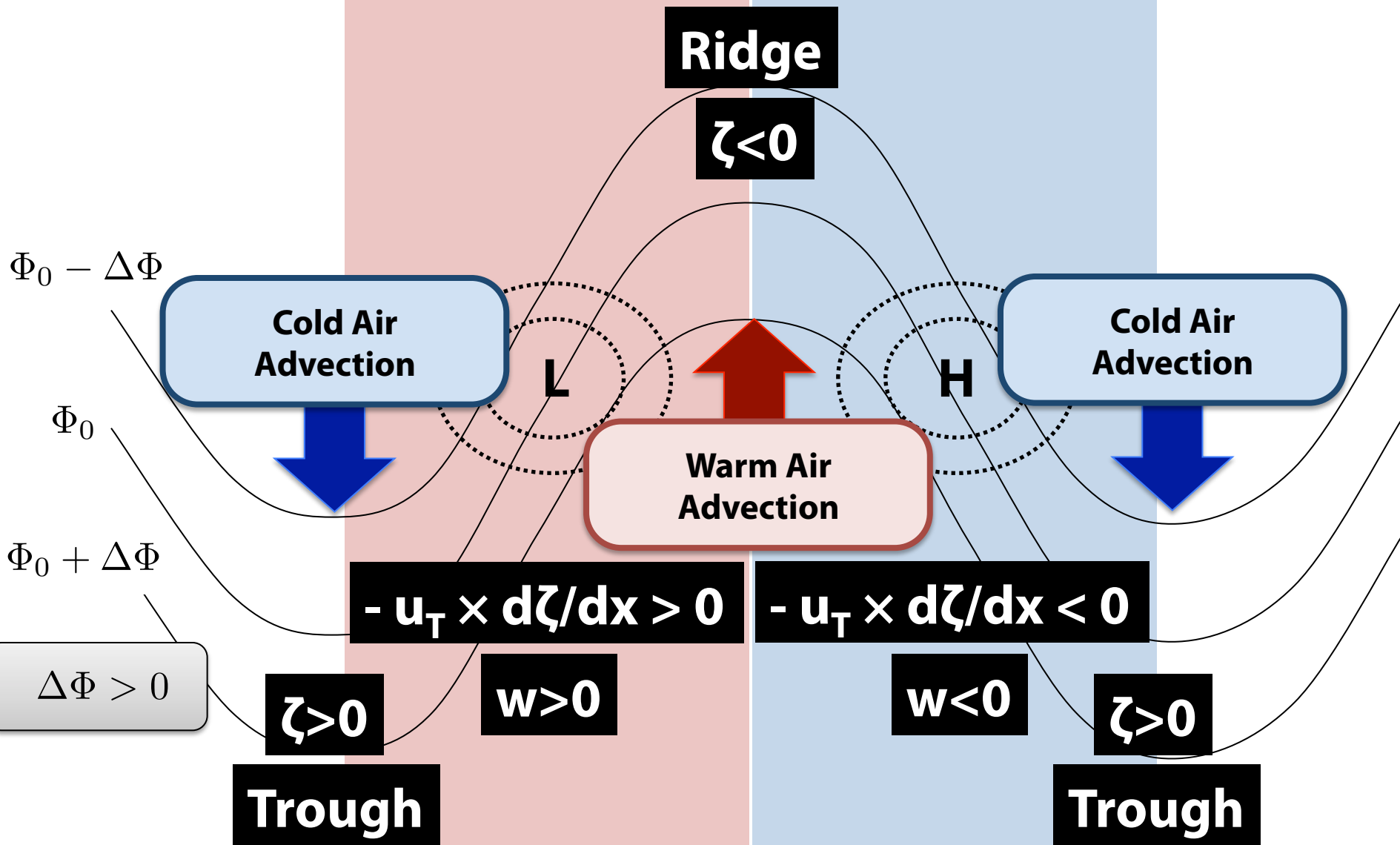


QG Baroclinic Disturbance

Northern Hemisphere

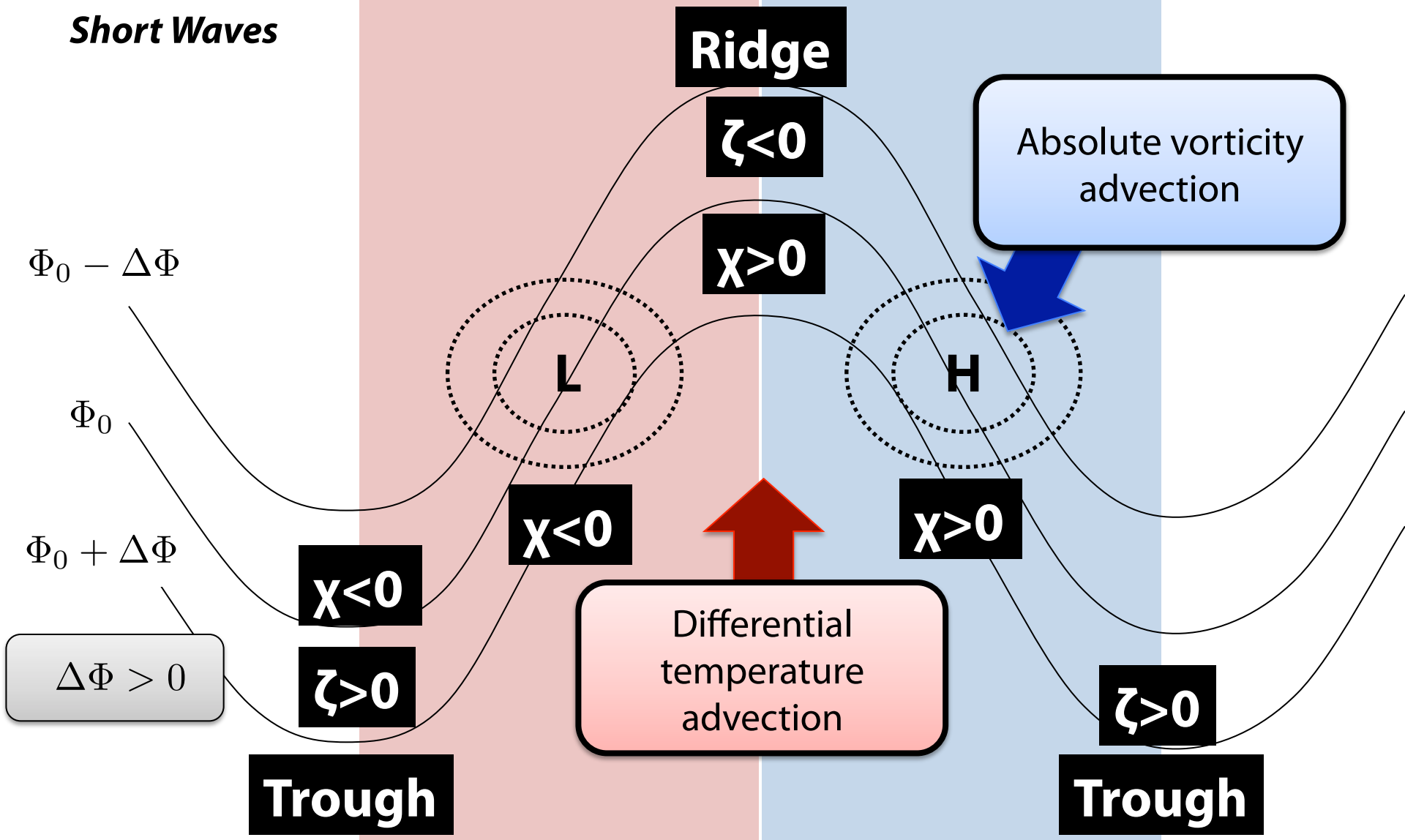


An Upper Tropospheric Wave



An Upper Tropospheric Wave

Short Waves



An Upper Tropospheric Wave

$\zeta < 0$; anticyclonic

→ Short waves, advection of relative vorticity is larger →

$\Phi_0 - \Delta\Phi$

Φ_0

Φ_0

$\Delta\Phi > 0$



B

H



A

C

$\zeta > 0$; cyclonic

$\zeta > 0$; cyclonic

← Long waves, advection of planetary vorticity is larger ←