

## Pressure Gradient Acceleration

The acceleration that results from the unequal distribution of pressure along each of the coordinate axes is called the “pressure gradient acceleration.”

Conceptually, it is strongest in areas in which the isobars are closest together.

Here are the pressure gradient accelerations on each of the coordinate axes. But usually, we partition this acceleration into a “horizontal” and a “vertical” pressure gradient acceleration.

$$a_x = -\frac{1}{\rho} \frac{\Delta p}{\Delta x}$$

$$a_y = -\frac{1}{\rho} \frac{\Delta p}{\Delta y}$$

$$a_z = -\frac{1}{\rho} \frac{\Delta p}{\Delta z}$$

The pressure gradient acceleration acts to accelerate air parcels from higher values of pressure to lower values of pressure, at right angles to the isobars, with a greater magnitude where the isobars are closest together. As in the case for all accelerations, the unit for pressure gradient acceleration is  $\text{m s}^{-2}$ .