

Effect of horizontal acceleration on a body moving in N-hemisphere

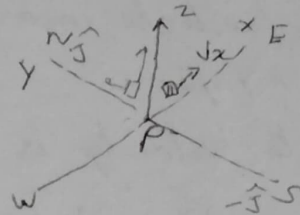
① Body is moving along x axis (East)

$$\vec{a}_h = 2\omega \sin \lambda (v_y \hat{i} - v_x \hat{j})$$

$$v_y = 0$$

$$\vec{a}_h = -2\omega \sin \lambda v_x \hat{j}$$

$$\vec{F}_h = m\vec{a}_h = -2m\omega \sin \lambda v_x \hat{j}$$



② Body is moving along North, y axis

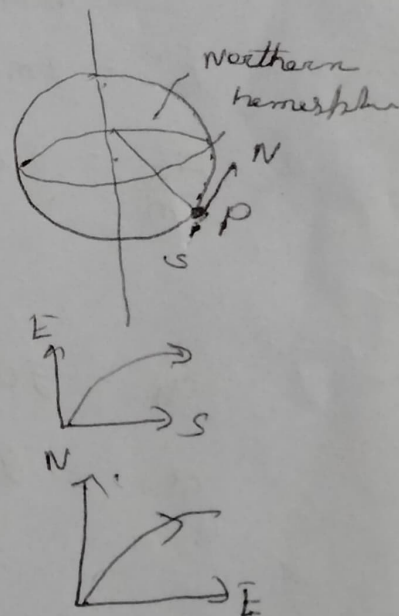
$$v_x = 0$$

$$\vec{a}_h = 2\omega \sin \lambda v_y \hat{i}$$

$$\vec{F}_h = m\vec{a}_h = 2m\omega \sin \lambda v_y \hat{i}$$

Note \rightarrow Southern hemisphere

If the particles moving in S-hemisphere of earth, it will be deflected towards left side



Effect vertical component of acc^m due to coriolis force

$$\vec{a}_v = 2\omega \cos \lambda v_x \hat{k}$$

$$\vec{F}_v = m\vec{a}_v = 2\omega m \cos \lambda v_x \hat{k}$$

It will reduce weight of the body