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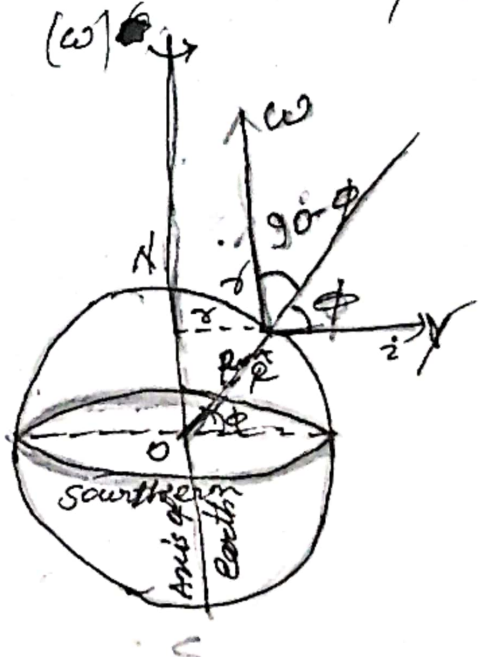
Coriolis force.

Coriolis force ($-2m\omega \times V$) is a fictitious force which act on a Particle only if it is moving with respect to the rotating frame. Thus in the rotating frame if a particle moves with velocity V_r then it always experiences a force ($-2m\omega \times V_r$) perpendicular to its path opposite to the direction of vector product $\omega \times V_r$. Due to the coriolis force a moving particle in the northern hemisphere is deflected the right of its path. In the Southern hemisphere, the deflection is towards the left of the path. The effect of the coriolis forces is appreciable when it act horizontally or has a horizontal component because in the vertical direction it effect is masked by the large gravitational force. Since this force is a comparatedly small force, its effect is observable only when a particle travels large horizontal distance. When the velocity V_r of the moving particle the ~~the~~ rotating frame is horizontal.



The horizontal component of coriolis force will be only due to the ~~Vertical~~ Vertical component $\omega \sin\phi$ of angular velocity ω where $\sin\phi$ is the latitude of the place. Hence the magnitude of horizontal coriolis force is

~~$2m\omega \sin\phi$~~

is $2\omega v \sin\phi$ and is zero for $\phi = 0$, i.e., at the equator. An important effect of the coriolis force is that the freely falling bodies deviate from there true vertical path. This deviation is always towards East in ~~eco~~ either of the hemisphere of the earth. In such a case the vertical fall means a velocity along vertical direction. Due to the horizontal component to earth's angular velocity, coriolis force starts to act on it in the horizontal direction and deviates the freely falling particle from the true vertical direction. The derivation of an expression for this ~~dev~~ deviation is given in next section.