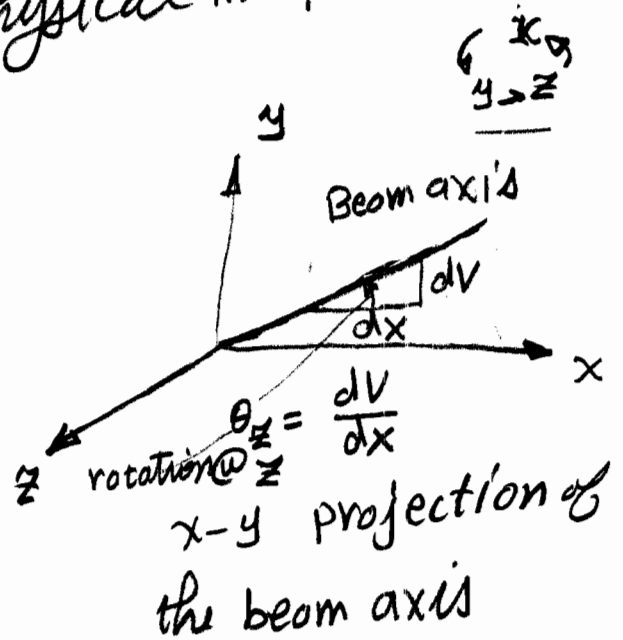
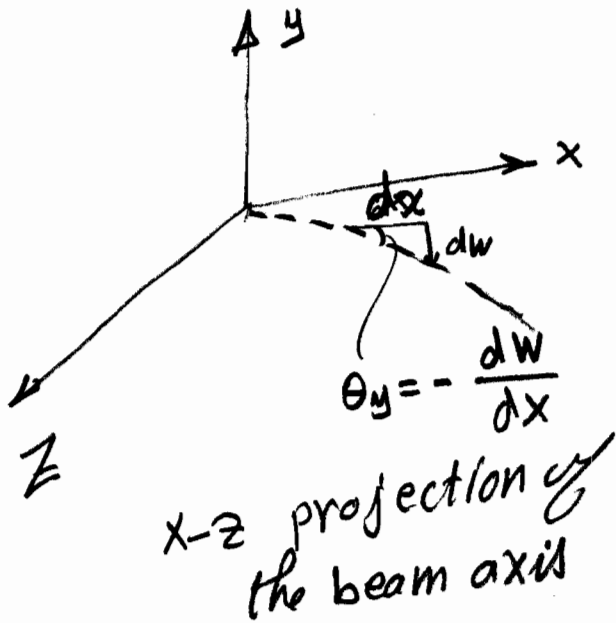


# Displacement in the Euler Bernoulli Beam

$$U = \underbrace{v(x)j + w(x)k}_{\text{pure rotations}} + \underbrace{\theta(x)x(yj + zk)}_{\text{rigid body rotation}}$$

# The derivation of this equation is given in the text book with some assumptions, the most important one is that the deflection and hence the rotation (slopes) are small  $(\frac{dv}{dx}, \frac{dw}{dx}) \ll 1$

Here, I will give you some physical interpretation of the above equation



∴ Total rotation (assume  $\theta_z$  &  $\theta_y$  are small)

$$\theta = \theta_y j + \theta_z k = -\frac{dw}{dx} j + \frac{dv}{dx} k$$

