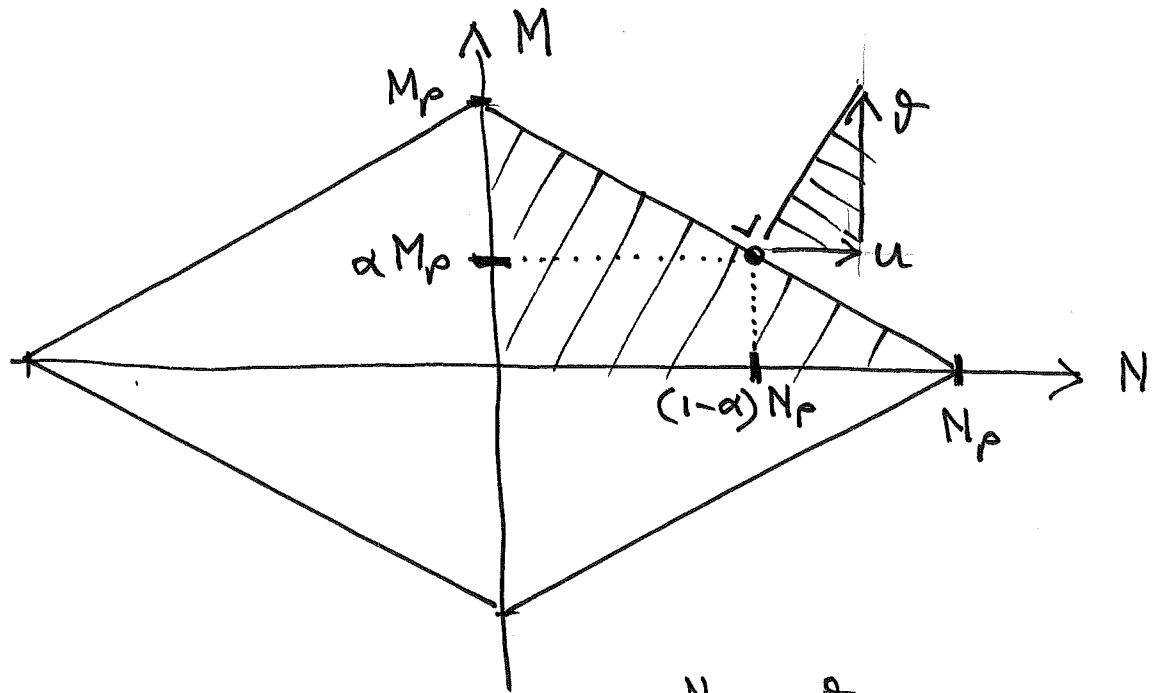
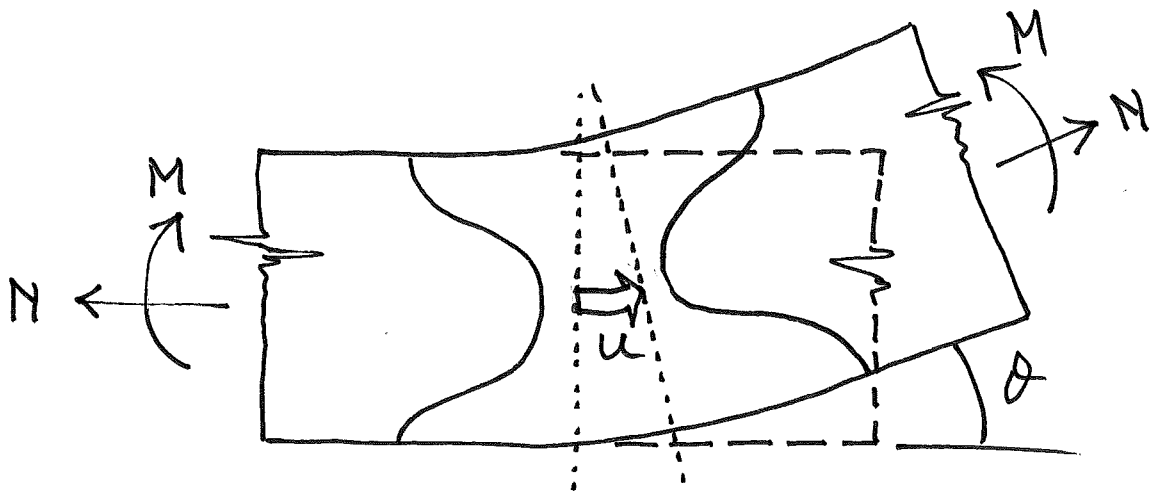


Virtual work in a plastic hinge



$$\frac{N_p}{M_p} = \frac{\theta}{u}$$



internal virtual work

$$E = M \theta + N u$$

$$= \alpha M_p \theta + (1-\alpha) M_p u$$

$$= \alpha M_p \theta + (1-\alpha) M_p \frac{\theta}{u} u$$

$$\boxed{E = M_p \theta}$$