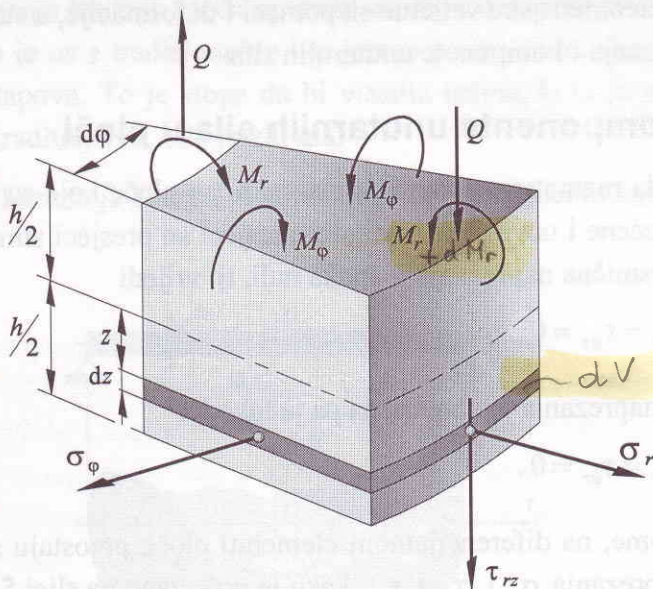


$$Q = \int_{-h/2}^{h/2} \tau_{rz} dz. \quad (5.4)$$



Slika 5.3 Komponente naprezanja i unutarnjih sila

Na sličan način možemo dobiti izraze za momente savijanja  $M_r$  i  $M_\varphi$

$$M_r = \int_{-h/2}^{h/2} \sigma_r z dz, \quad M_\varphi = \int_{-h/2}^{h/2} \sigma_\varphi z dz. \quad (5.5)$$

Poslije ćemo pokazati da su komponente naprezanja  $\sigma_r$  i  $\sigma_\varphi$  raspodijeljene linearno po debljini ploče u skladu s izrazom (5.14), tj.

$$\sigma_r = \frac{E}{1-\nu^2} \left( \frac{d\alpha}{dr} + \nu \frac{\alpha}{r} \right) z, \quad \sigma_\varphi = \frac{E}{1-\nu^2} \left( \frac{\alpha}{r} + \nu \frac{d\alpha}{dr} \right) z.$$

Ako (5.14) uvrstimo u (5.5) i sredimo, dobit ćemo

$$M_r = \frac{E}{1-\nu^2} \left( \frac{d\alpha}{dr} + \nu \frac{\alpha}{r} \right) \int_{-h/2}^{h/2} z^2 dz, \quad M_\varphi = \frac{E}{1-\nu^2} \left( \frac{\alpha}{r} + \nu \frac{d\alpha}{dr} \right) \int_{-h/2}^{h/2} z^2 dz,$$