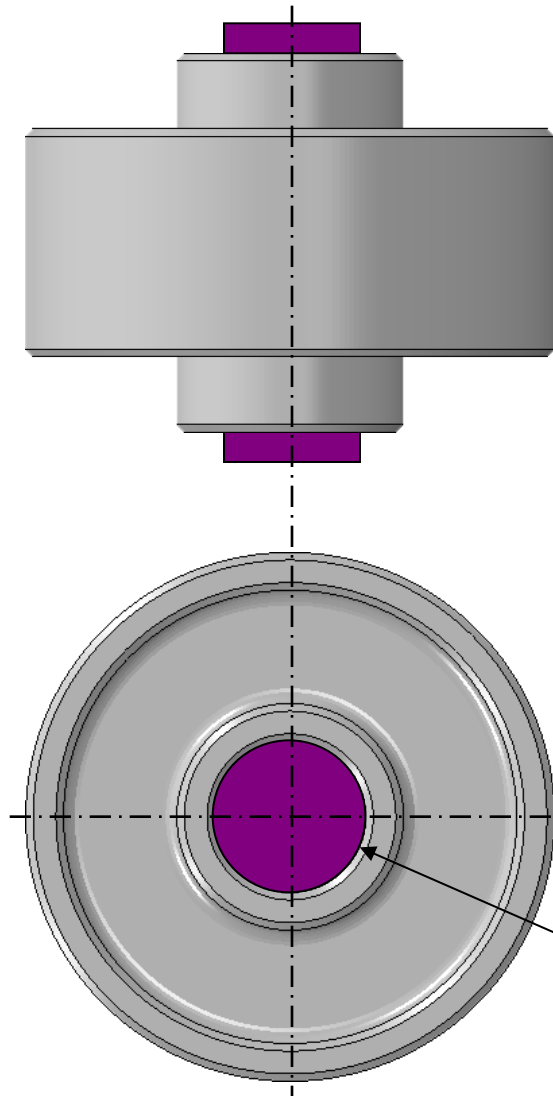
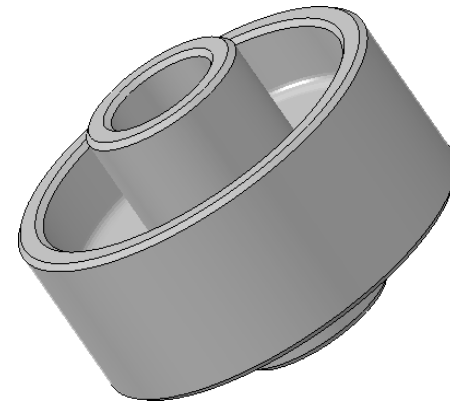


- primer reševanja osno-simetričnega mehanskega problema z MKE



vztrajnik



$$E = 200000 \text{ MPa}$$

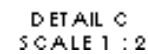
$$\nu = 0.3$$

$$\rho = 7800 \text{ kg/m}^3$$

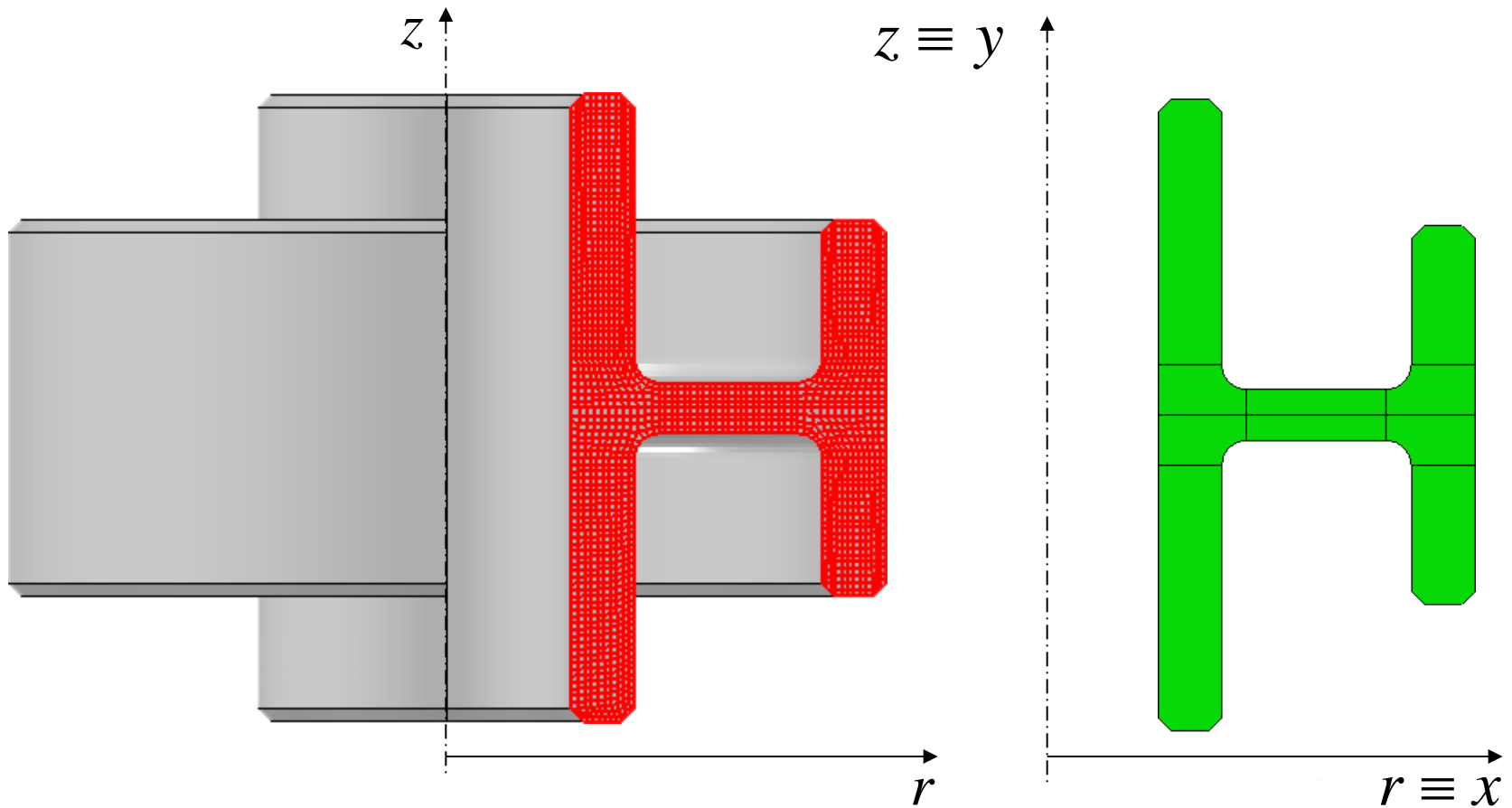
$$n = 2400 \text{ vrt/min}$$

$$\delta = 0.05 \text{ mm (glede na premer)}$$

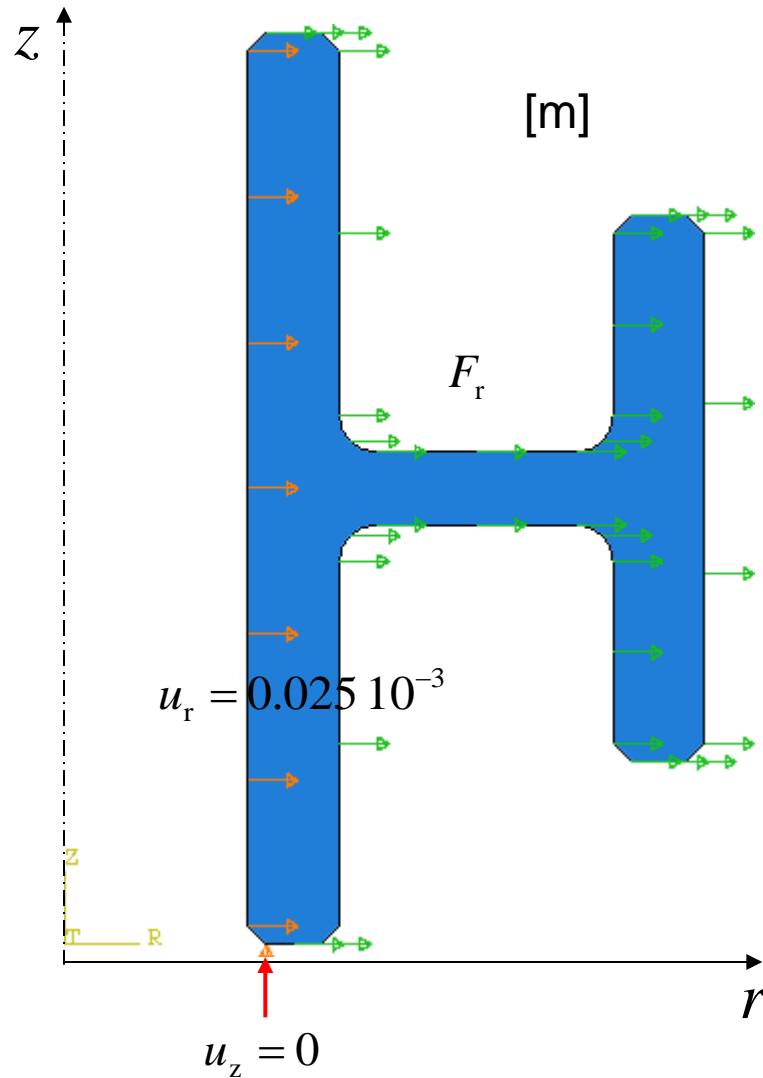
- izmere vztrajnika



- priprava numeričnega modela



- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r \text{ [N]} = [\text{kg m/s}^2]$$

$$\rho \text{ [kg/m}^3\text{]}$$

$$V \text{ [m}^3\text{]}$$

$$a_r = \omega^2 r \text{ [m/s}^2\text{]}$$

$$\omega_{\text{Abaqus}} = n 2\pi \text{ [rad/s]}$$

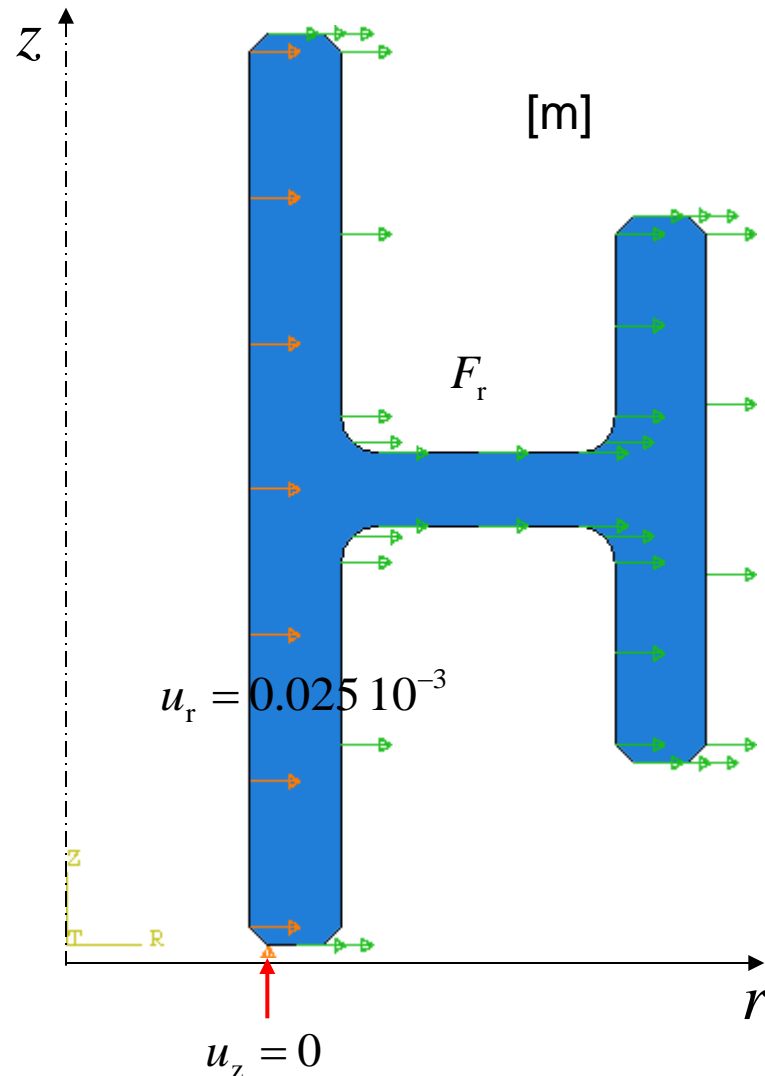
$$n \text{ [vrt/s]}$$

$$r \text{ [m]}$$

$$E \text{ [Pa]} = [\text{N/m}^2]$$

$$\nu \text{ [1]}$$

- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r \text{ [N]} = [\text{kg m/s}^2]$$

$$\rho \text{ [kg/m}^3\text{]} = 7800 \text{ kg/m}^3$$

$$V \text{ [m}^3\text{]}$$

$$a_r = \omega^2 r \text{ [m/s}^2\text{]}$$

$$\omega_{Abaqus} = n 2 \pi \text{ [rad/s]} = 251.33 \text{ rad/s}$$

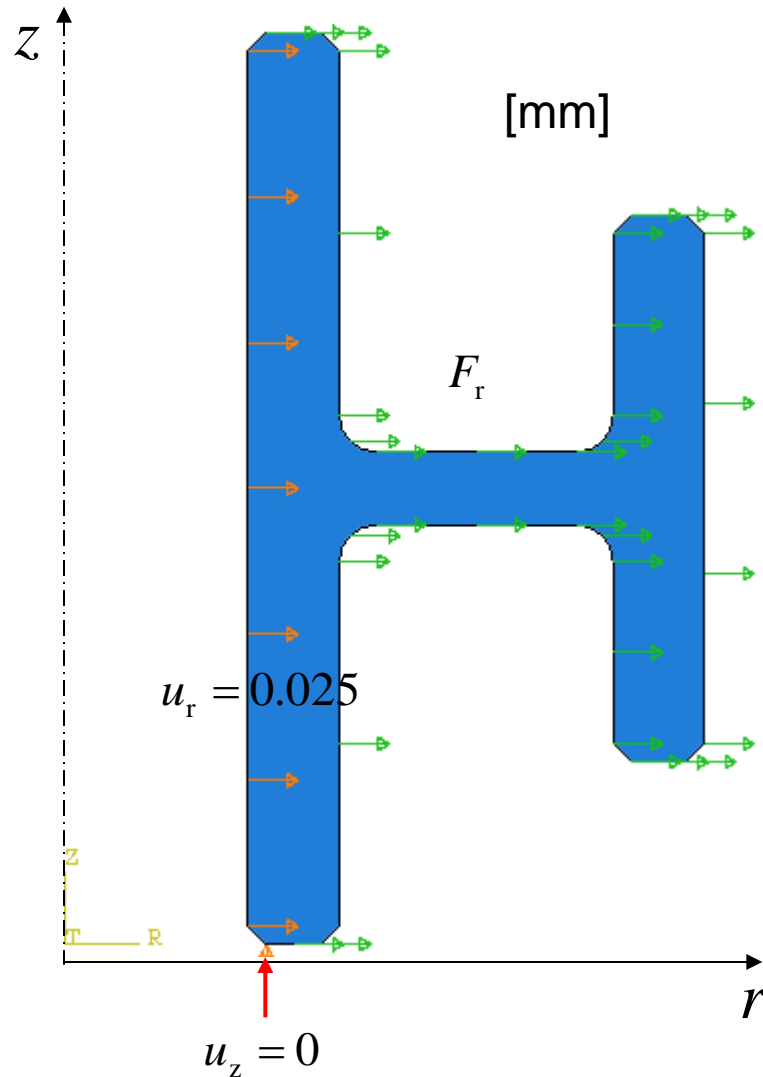
$$n \text{ [vrt/s]}$$

$$r \text{ [m]}$$

$$E \text{ [Pa]} = [\text{N/m}^2] = 200000 \cdot 10^6 \text{ N/m}^2$$

$$\nu [1] = 0.3$$

- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r \text{ [N]} = [\text{kg m/s}^2]$$

$$\rho \text{ [kg/mm}^3\text{]}$$

$$V \text{ [mm}^3\text{]}$$

$$a_r = \omega^2 r \text{ [m/s}^2\text{]}$$

$$\omega_{Abaqus} = \frac{n \, 2 \pi}{\sqrt{1000}} \text{ [rad/s]}$$

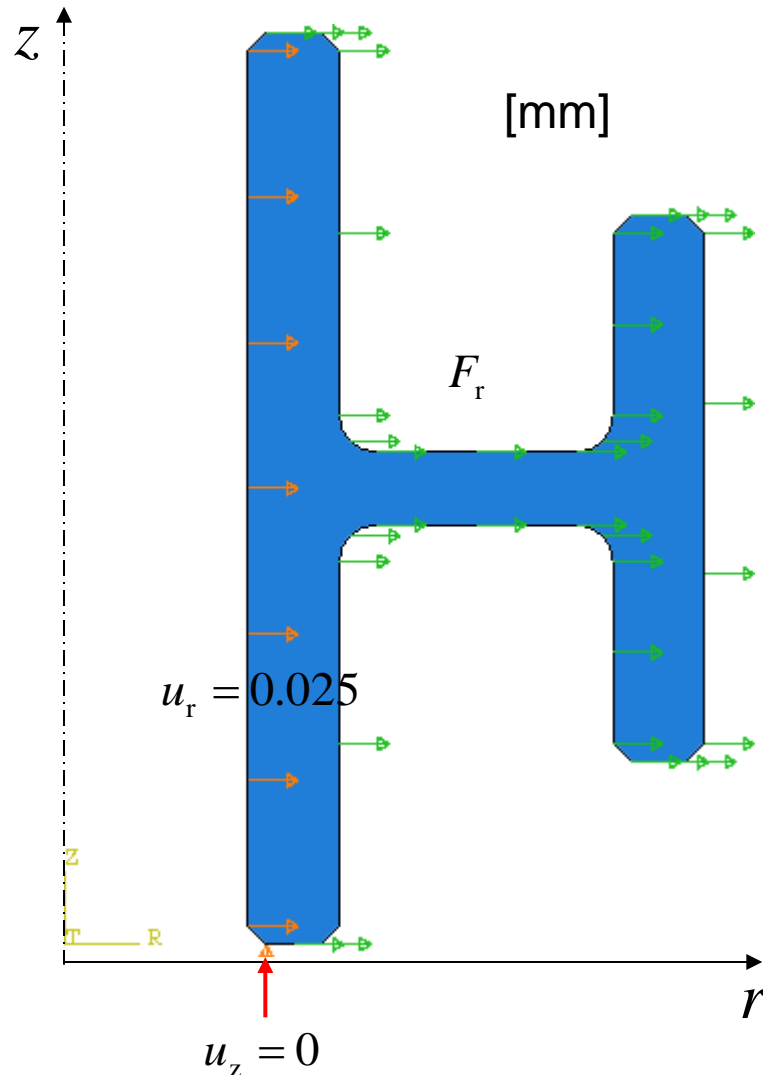
$$n \text{ [vtr/s]}$$

$$r \text{ [mm]}$$

$$E \text{ [MPa]} = [\text{N/mm}^2]$$

$$\nu \text{ [1]}$$

- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r \text{ [N]} = [\text{kg m/s}^2]$$

$$\rho \text{ [kg/mm}^3\text{]} = 7800 \cdot 10^{-9} \text{ kg/mm}^3$$

$$V \text{ [mm}^3\text{]}$$

$$a_r = \omega^2 r \text{ [m/s}^2\text{]}$$

$$\omega_{\text{Abaqus}} = \frac{n \cdot 2 \pi}{\sqrt{1000}} \text{ [rad/s]} = 7.95 \text{ rad/s}$$

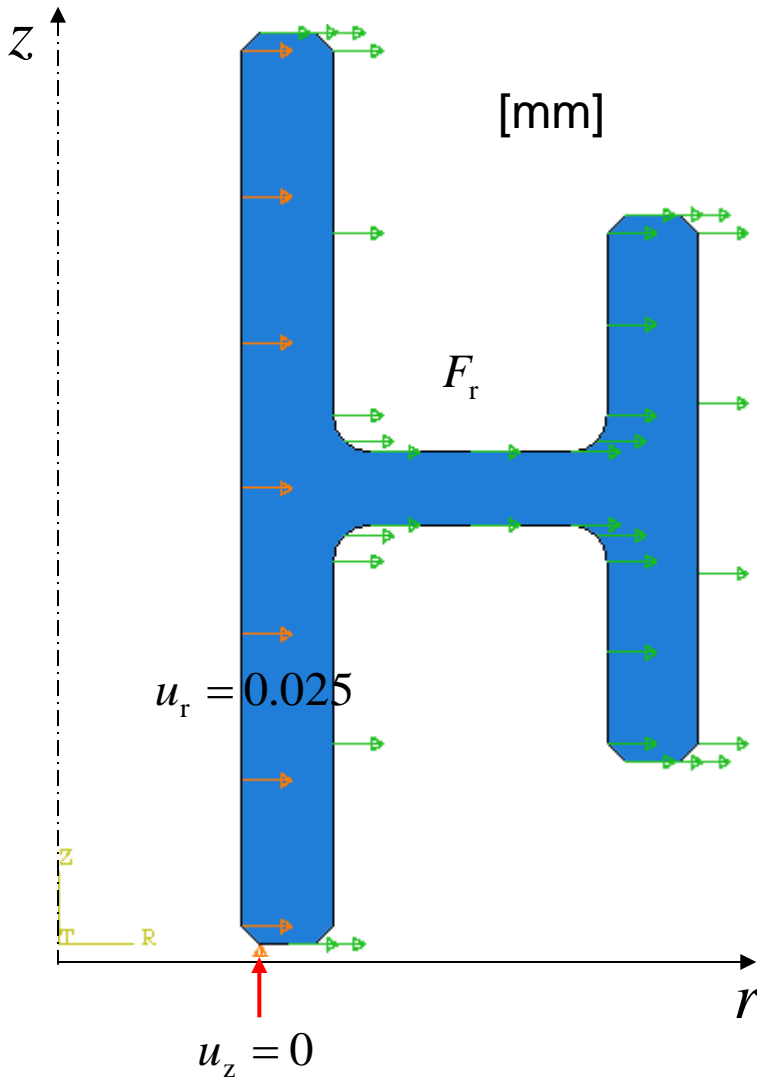
$$n \text{ [vtr/s]}$$

$$r \text{ [mm]}$$

$$E \text{ [MPa]} = [\text{N/mm}^2] = 200000 \text{ N/mm}^2$$

$$\nu [1] = 0.3$$

- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r \text{ [N]} = [\text{t mm/s}^2]$$

$$\rho \text{ [t/mm}^3\text{]}$$

$$V \text{ [mm}^3\text{]}$$

$$a_r = \omega^2 r \text{ [mm/s}^2\text{]}$$

$$\omega_{Abaqus} = n 2\pi \text{ [rad/s]}$$

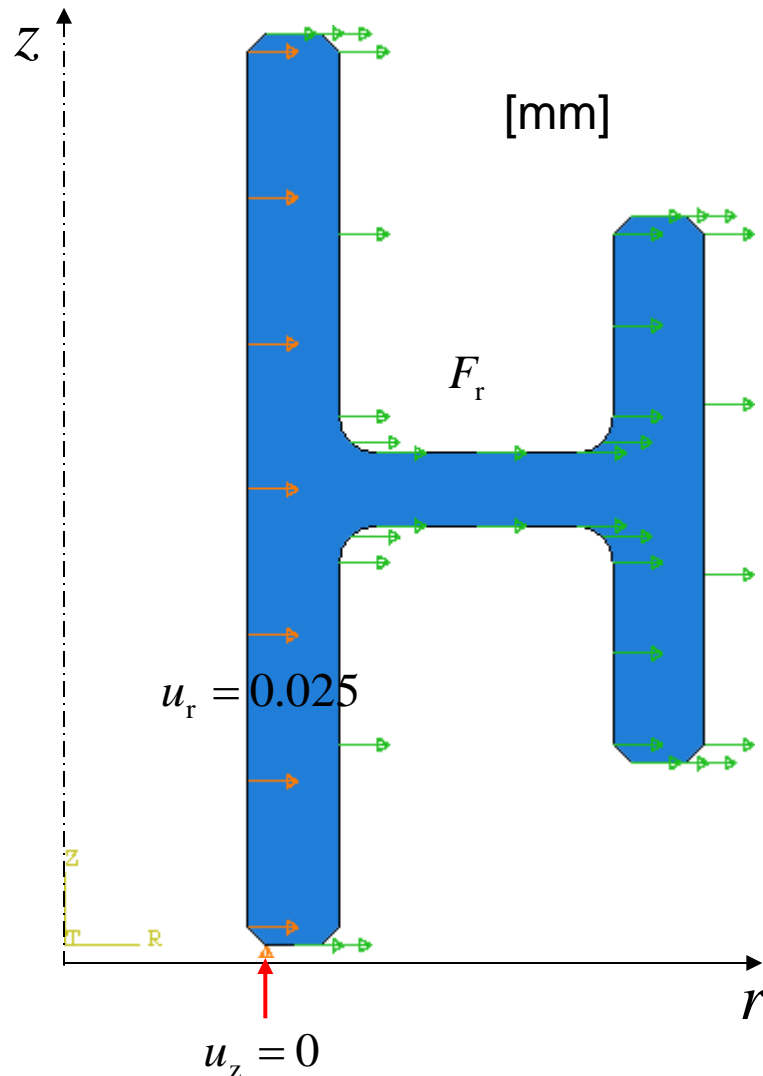
$$n \text{ [vtr/s]}$$

$$r \text{ [mm]}$$

$$E \text{ [MPa]} = [\text{N/mm}^2]$$

$$\nu \text{ [1]}$$

- robni pogoji in obremenitve



$$F_r = m a_r = \rho V a_r [\text{N}] = [\text{t mm/s}^2]$$

$$\rho [\text{t/mm}^3] = 7.8 \cdot 10^{-9} \text{ t/mm}^3$$

$$V [\text{mm}^3]$$

$$a_r = \omega^2 r [\text{mm/s}^2]$$

$$\omega_{\text{Abaqus}} = n \cdot 2\pi [\text{rad/s}] = 251.33 \text{ rad/s}$$

$$n [\text{vtr/s}]$$

$$r [\text{mm}]$$

$$E [\text{MPa}] = [\text{N/mm}^2] = 200000 \text{ N/mm}^2$$

$$\nu [1] = 0.3$$