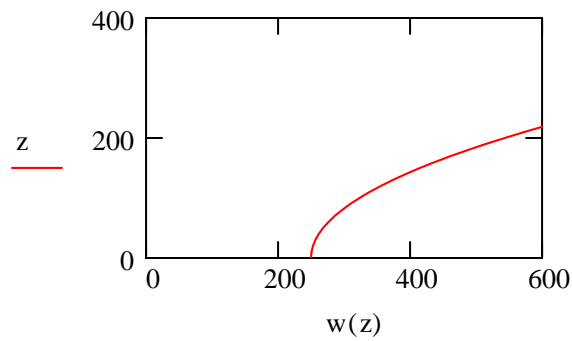


$$w_0 := 250 \quad \lambda := 1064 \quad z_0 := \pi \cdot \frac{w_0^2}{\lambda}$$

$$w(z) := w_0 \cdot \left[1 + \left(\frac{z}{z_0} \right)^2 \right] \quad z := 0, 10 \dots 2 \cdot w_0 \quad w_2(z) := w_0 \cdot \sqrt{1 + \left(\frac{z}{z_0} \right)^2}$$



$$w_0 = 250$$

$$z_0 = 184.539$$

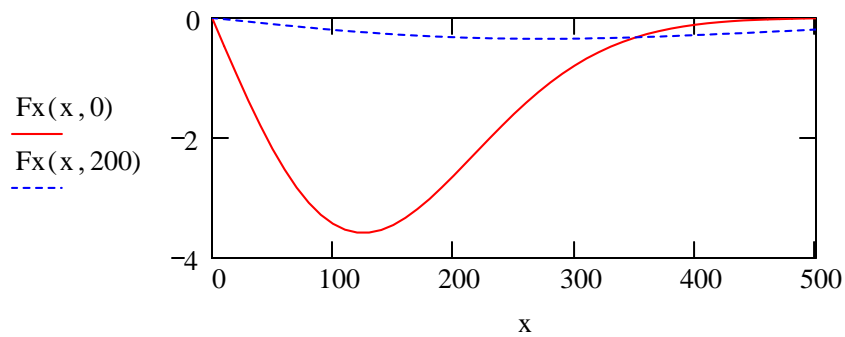
$$P := 500 \quad \text{Power in mW}$$

$$K := 580000 \quad \text{Trap spring constant}$$

$$I(x, z) := \frac{P}{\pi \cdot \frac{w(z)^2}{2}} \cdot \exp\left(\frac{-2 \cdot x^2}{w(z)^2}\right) \quad F_x(x, z) := -K \cdot \left(\frac{x}{w(z)^2}\right) \cdot I(x, z)$$

$$x := 0, 10 \dots 500$$

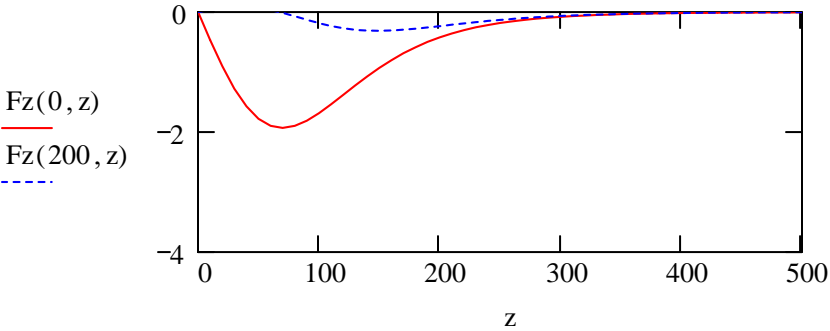
$$\frac{w_0^2}{z_0^2} = 1.835$$



$$f := 1 \qquad Fz(x,z) := -K \cdot \left(\frac{z}{w(z)^2} \right) \cdot I(x,z) \cdot f \cdot \left(1 - \frac{2 \cdot x^2}{w(z)^2} \right)$$

Relative size of Fz compared to Fx can be adjusted with factor f

$$z := 0, 10..500$$



$$Fx(100,100) = -1.394$$

$$Fz(100,100) = -1.127$$

$$Fx(0,0) = 0 \qquad Fx(100,0) = -3.432$$

$$Fz(0,0) = 0 \qquad Fz(0,100) = -1.688$$