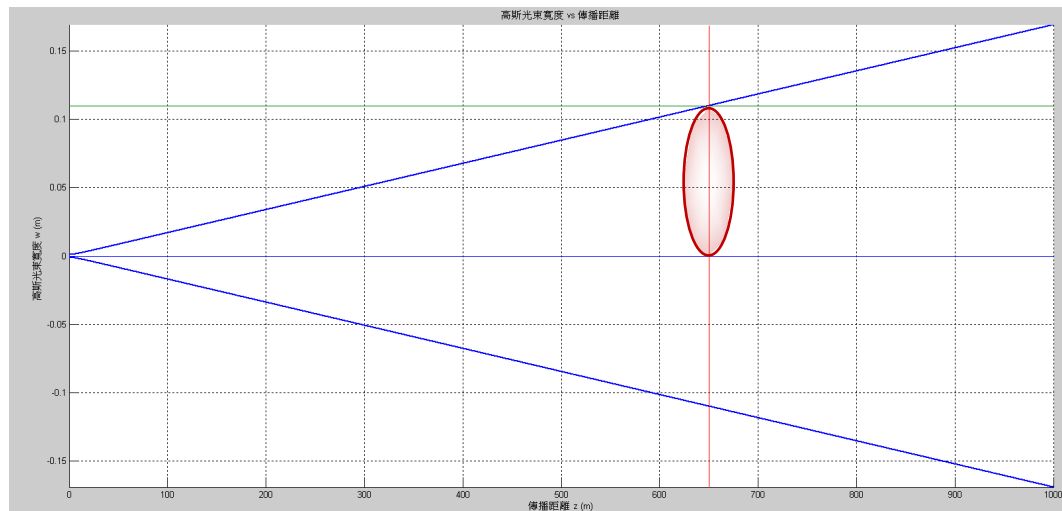


1. Gaussian Beam - MATLAB

(a).



(b). 0.1101(m)

(c). 58.756(m)

(d). $\frac{1\%}{8.254 \times 10^{-5}} = 121.15$

(e). Because

$$w_0 = \sqrt{\frac{\lambda z_0}{\pi}}$$

We can get

$$z_0 = \frac{w_0^2 \pi}{\lambda} = 5.905(\text{m})$$

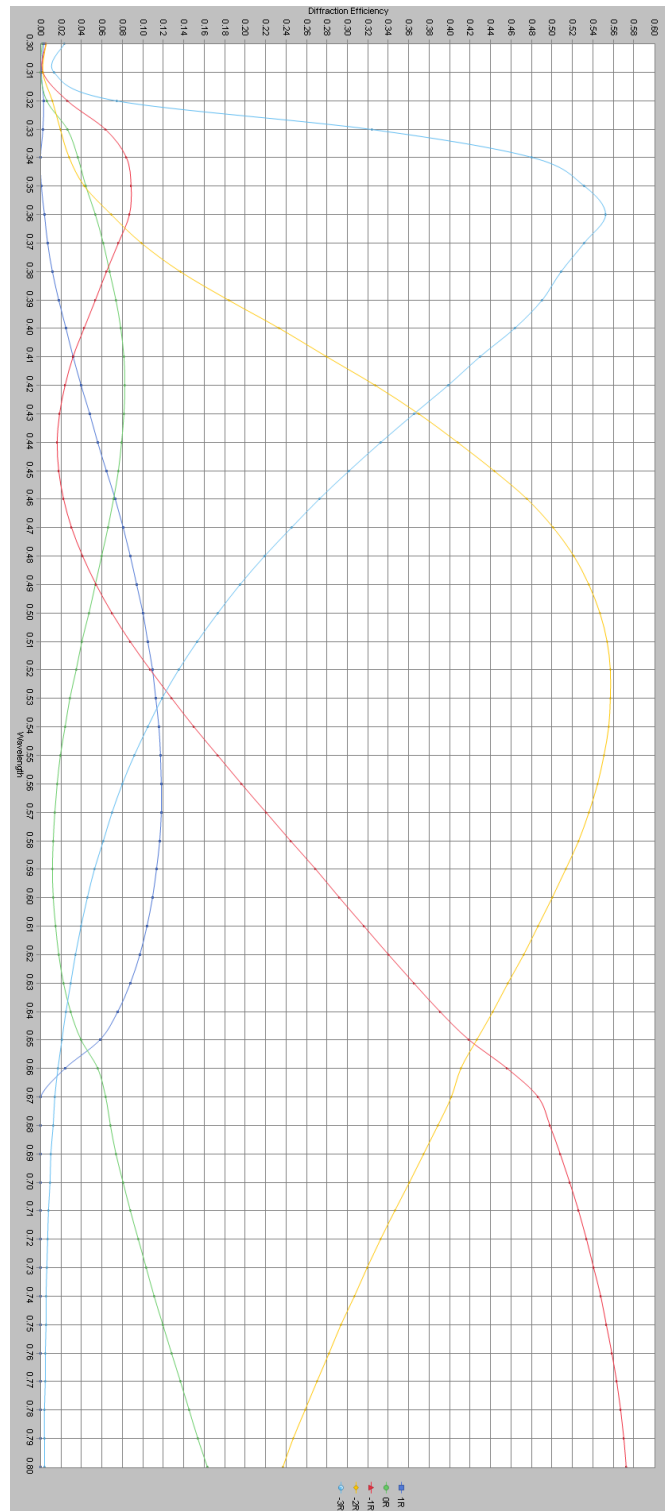
The radius of curvature of the mirror is

$$R(650(\text{m})) = 650 \left[1 + \left(\frac{z_0}{650} \right)^2 \right] = 650.05(\text{m})$$

And the radius of the mirror is 1(b), which is 0.1101(m)

2. Reflection Grating – Gsolver

At 532nm, 42° of incidence will cause the max diffraction efficiency.



3. Waveguide Coupler – Rsoft

- (a). $EO = 0.0032$
- (b). $EO = 0.00223$
- (c). $EO = 0.001474$

