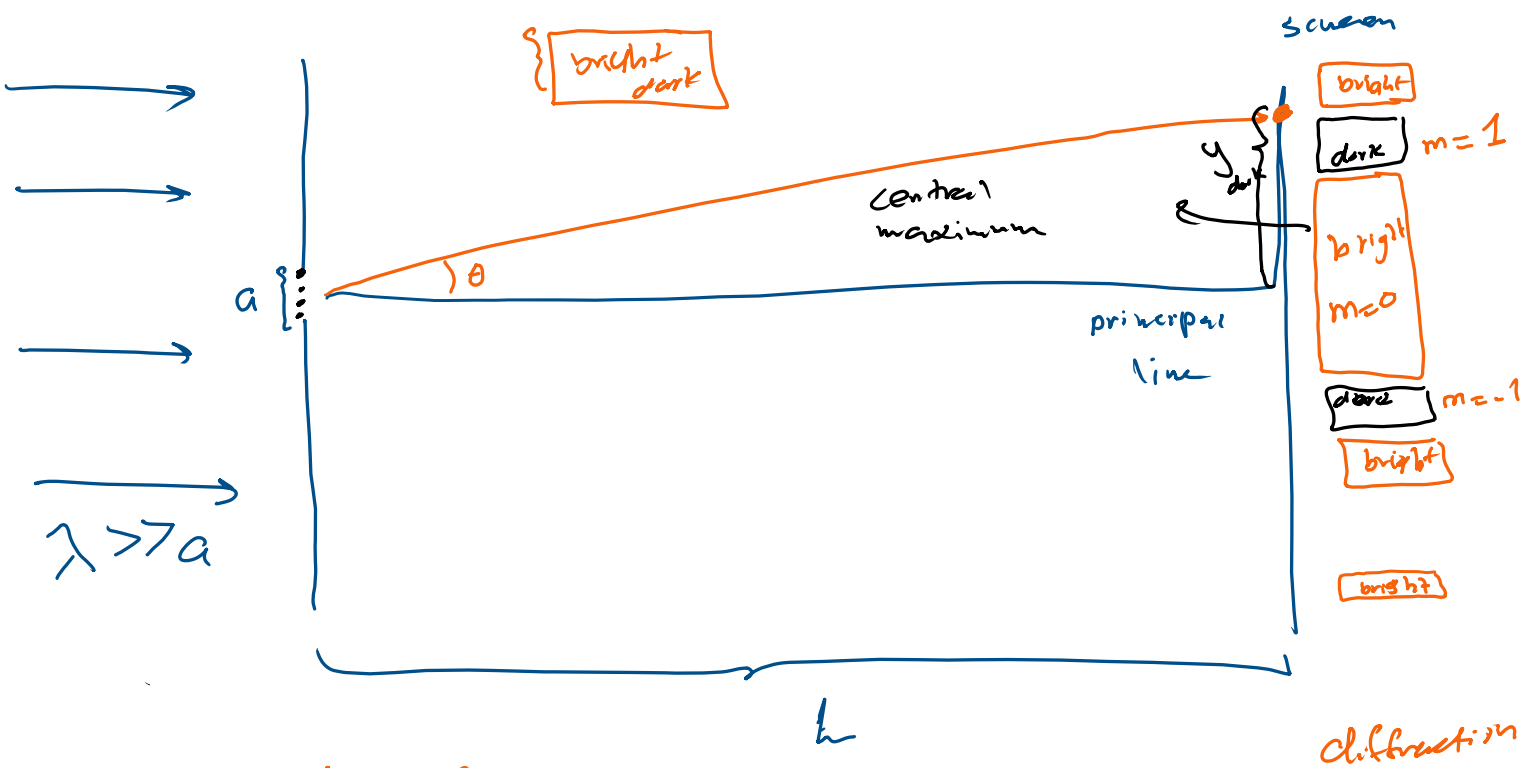


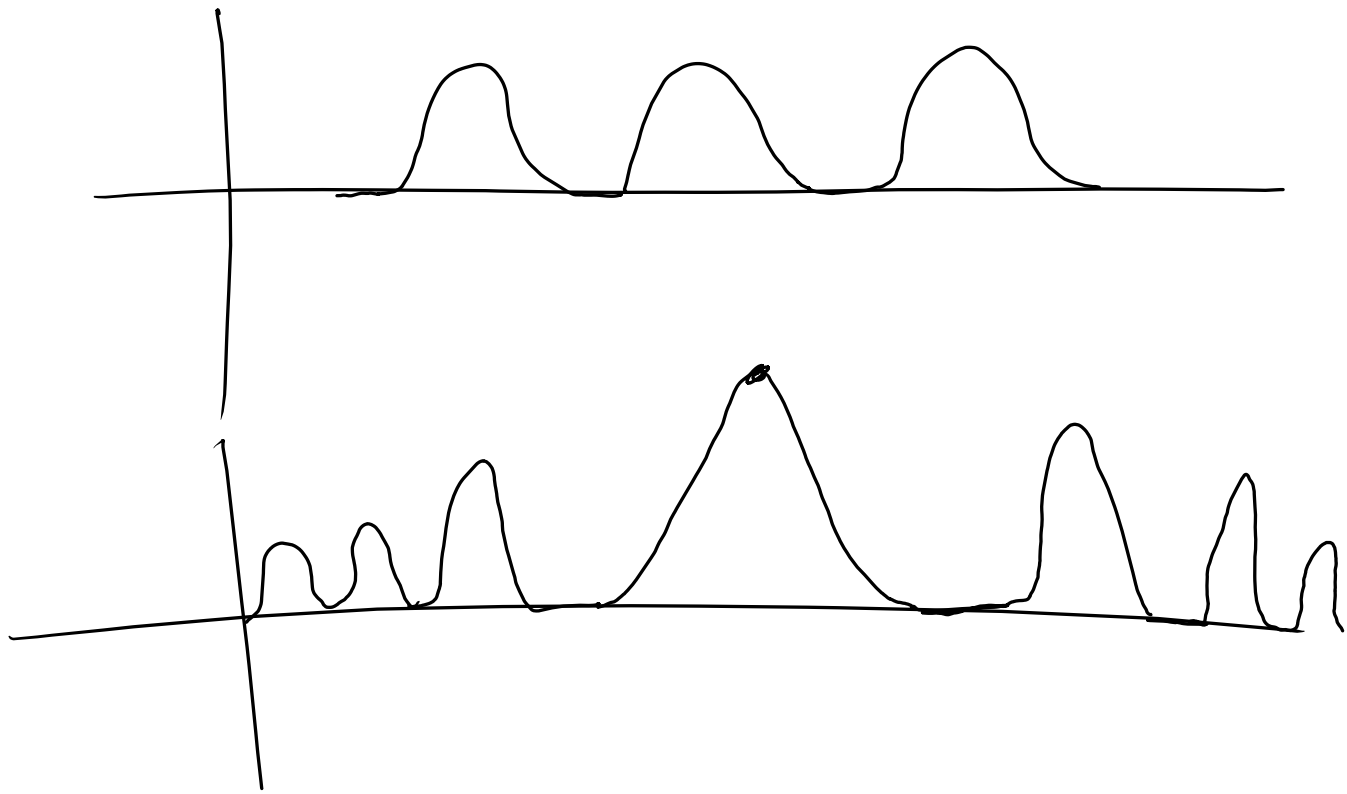
diffraction pattern

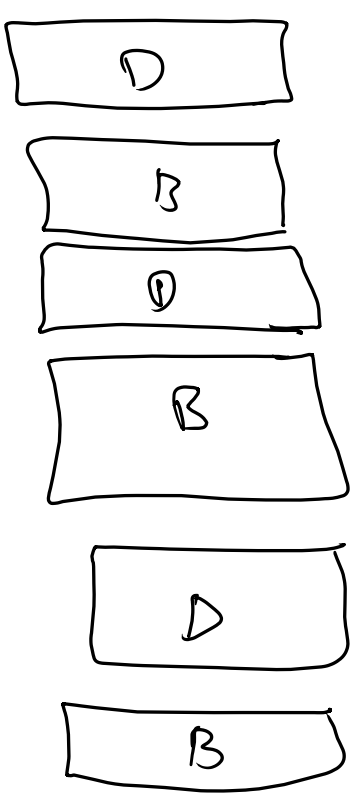
destructive interference:

$$a \sin\theta_{dark} = m\lambda \; ; \; m = \pm 1, \pm 2, \ldots$$

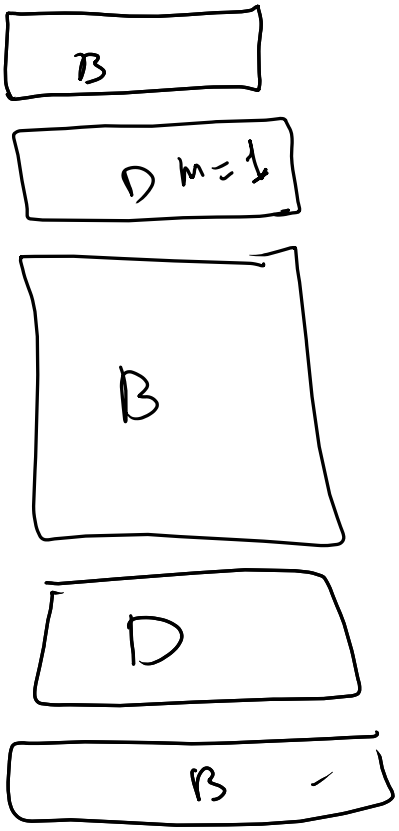
θ is small

$$\tan\theta_{dark} = \frac{y_{dark}}{L} \approx \sin\theta_{dark} = \theta_{dark}$$





Interference



diffraction

$$\frac{d \sin\theta}{a \sin\theta} = \frac{m\lambda}{m\lambda}$$

$$\frac{d}{a} = \frac{m\lambda}{\lambda} \Rightarrow \boxed{\frac{d}{a} = m}$$