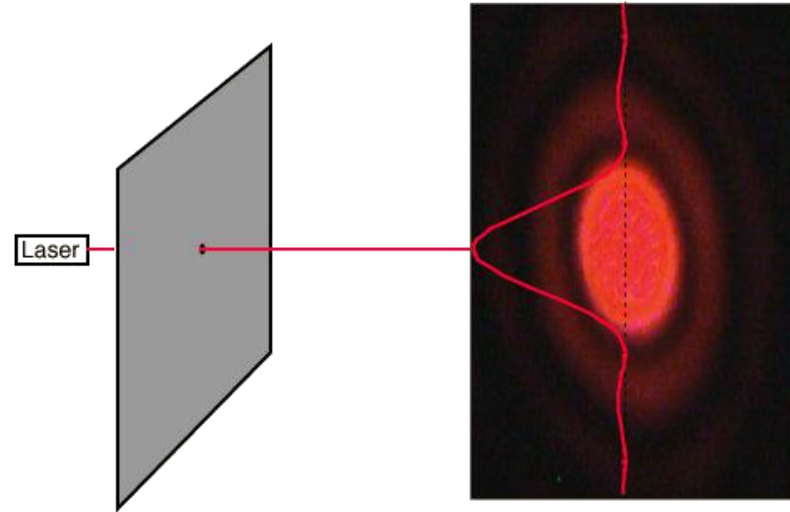


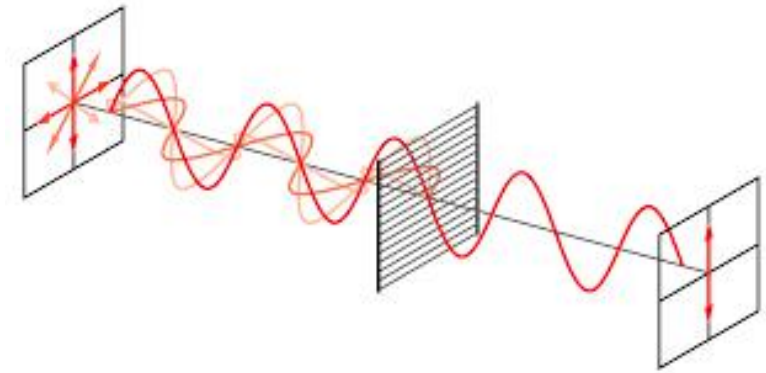
# Hullámoptika



Interferencia



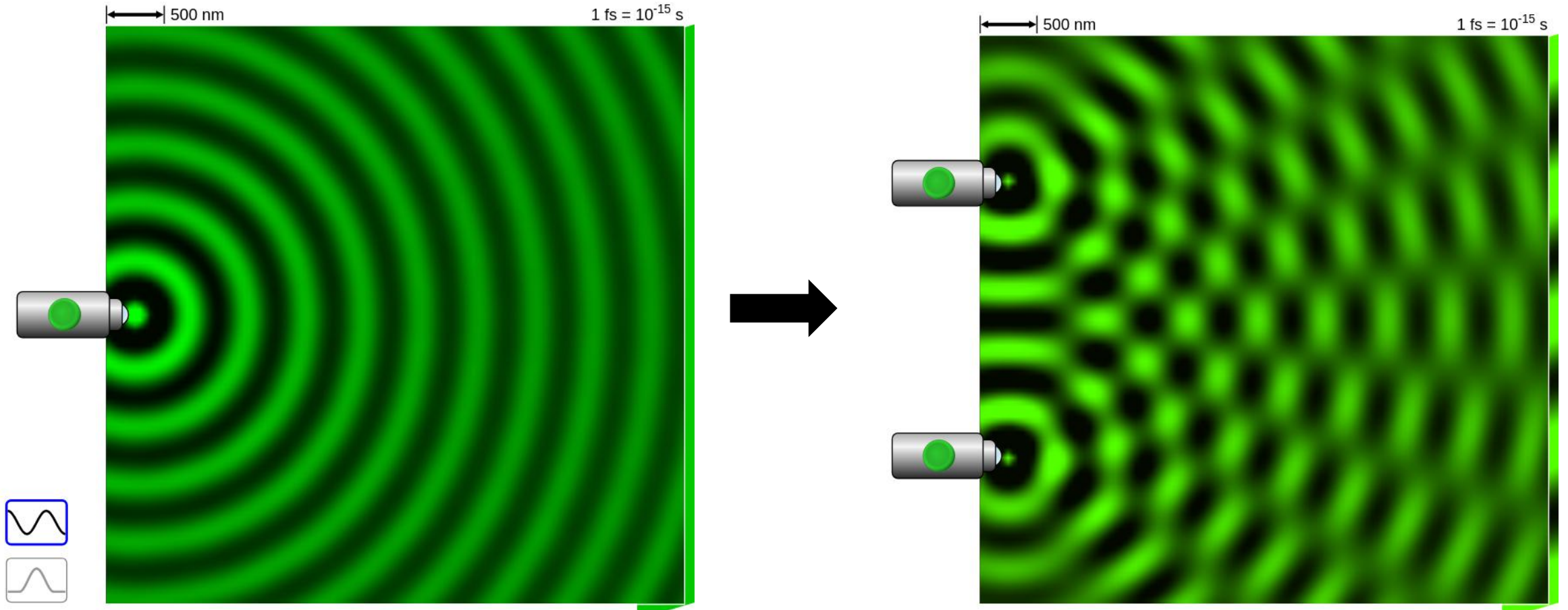
Diffrakció



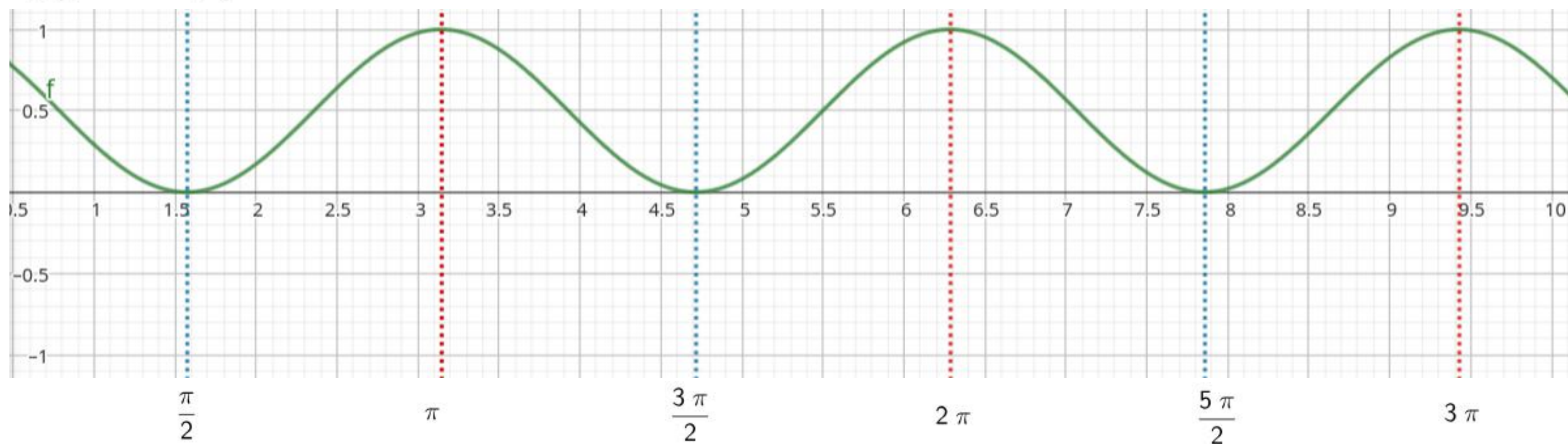
Polarizáció

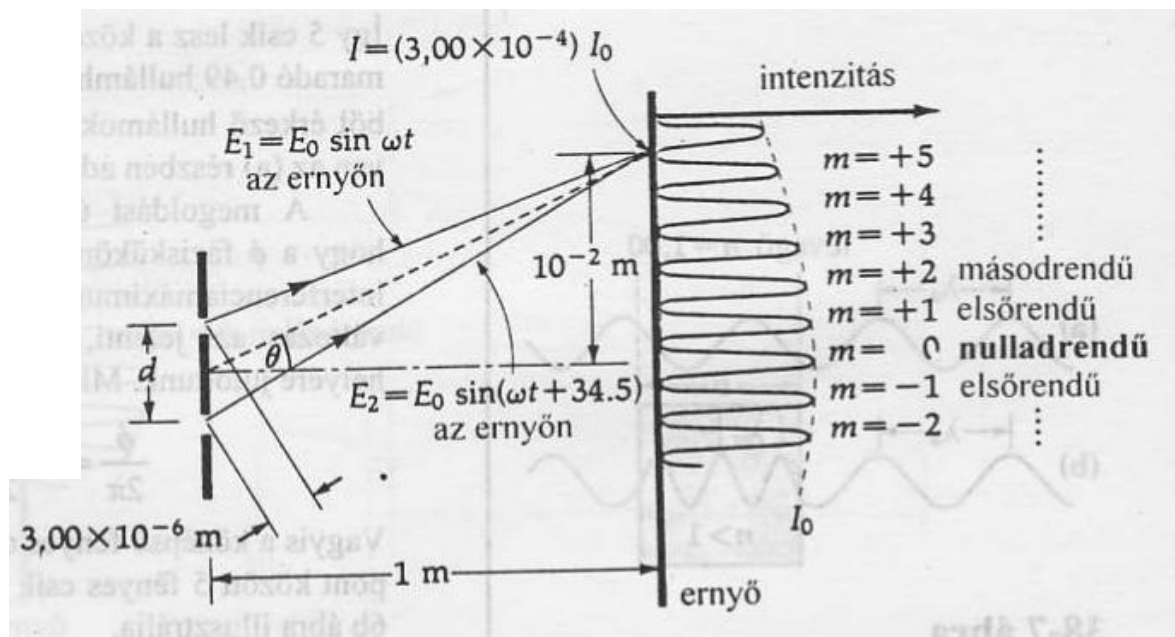
# Interferencia

[PHET link](#)



$$f(x) = \cos^2(x)$$



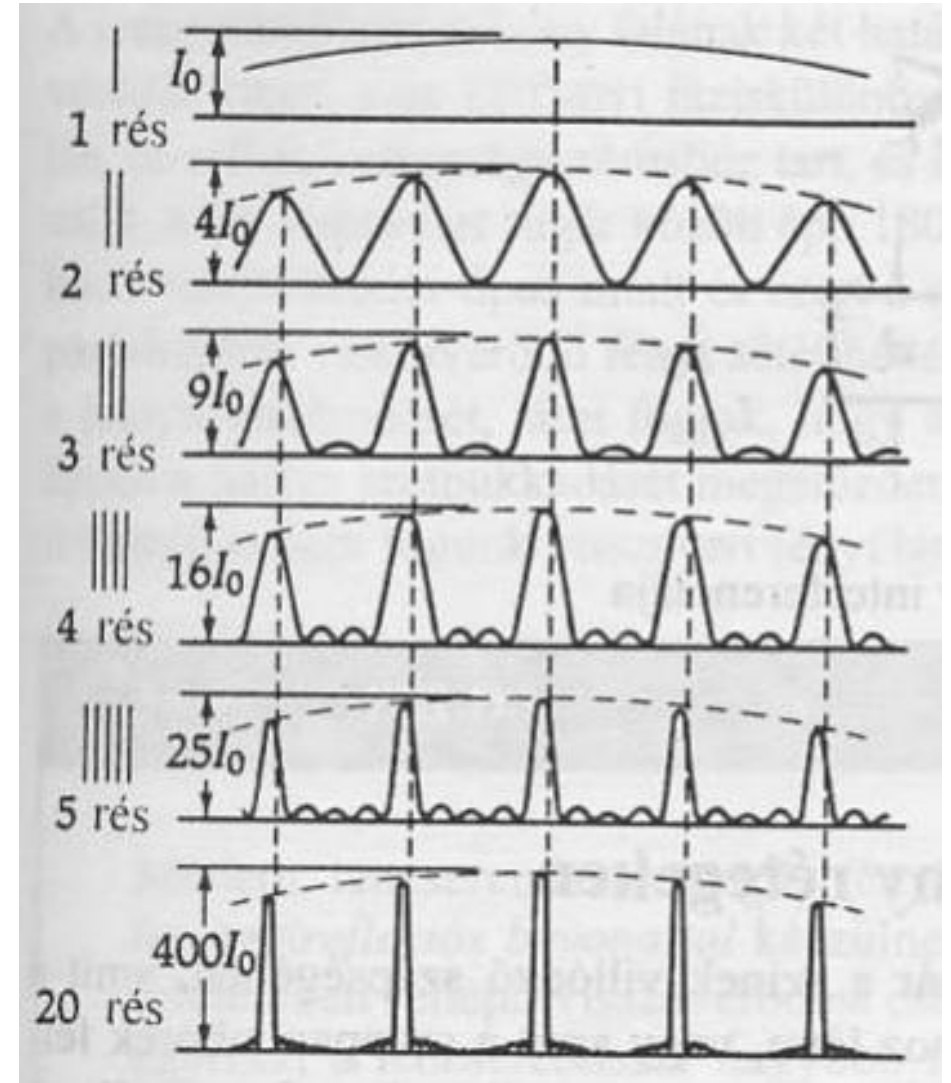
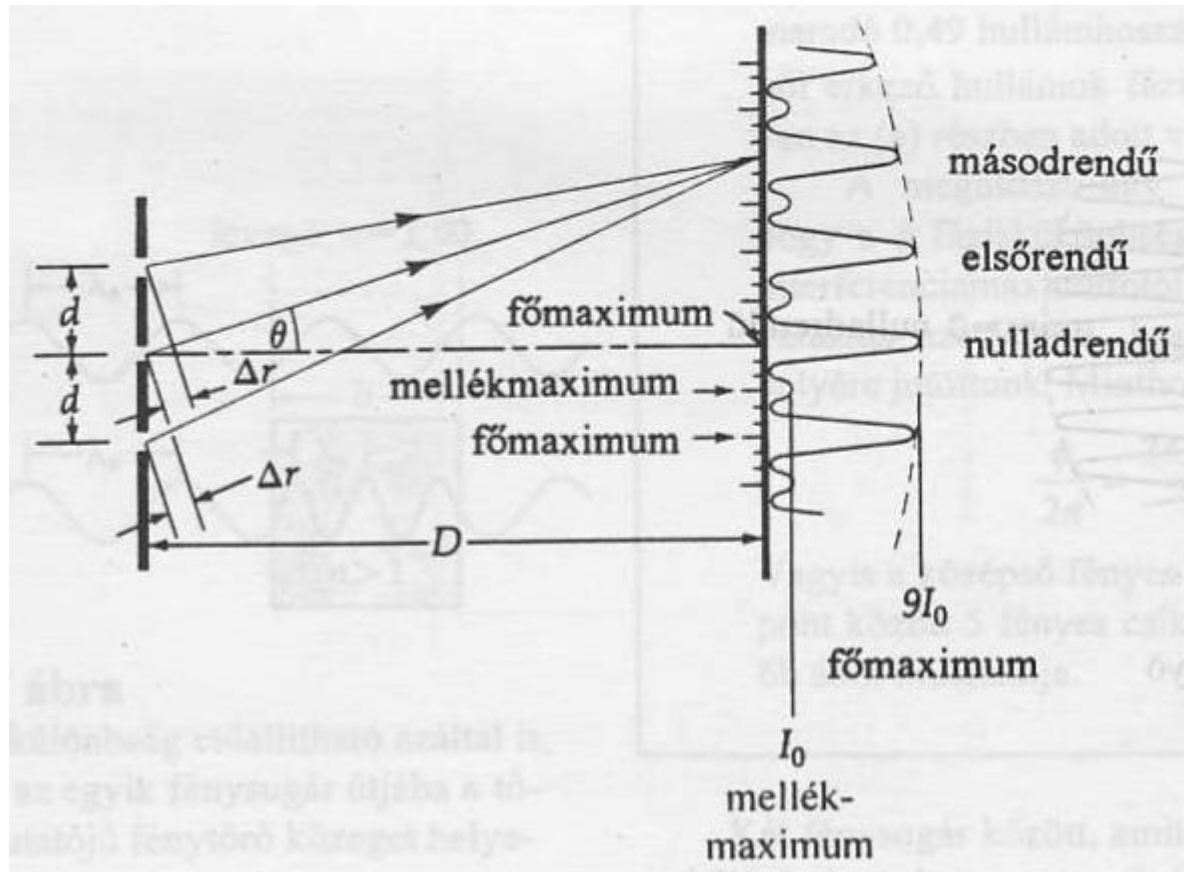


(b) A számértékek. A rések távolsága és az interferencia-kép mérete erősen eltúlzott.

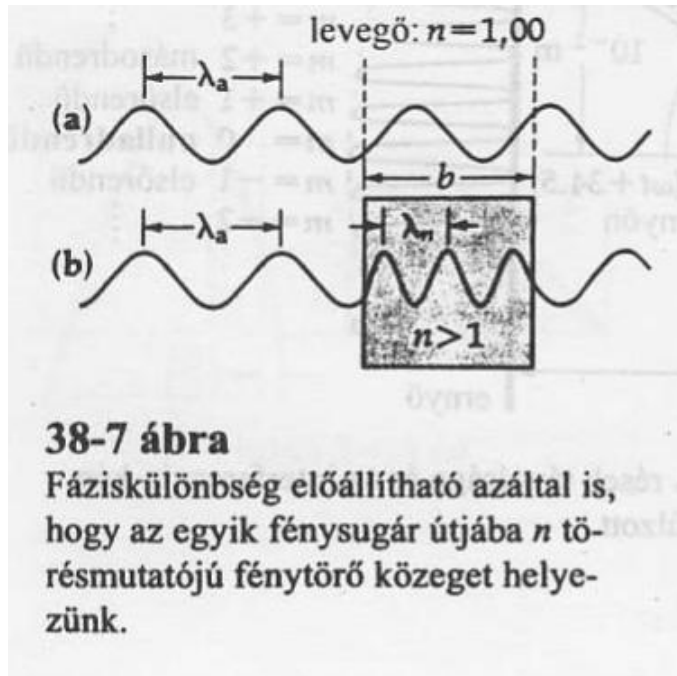




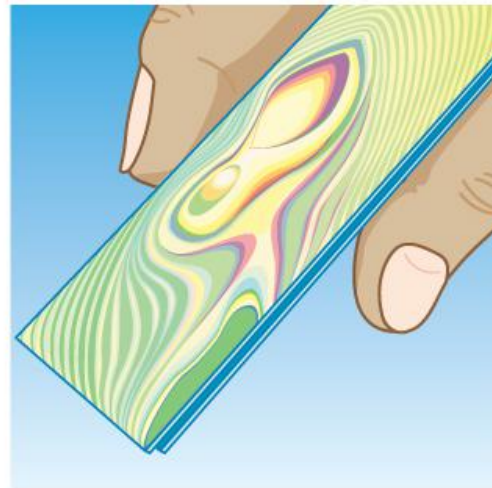
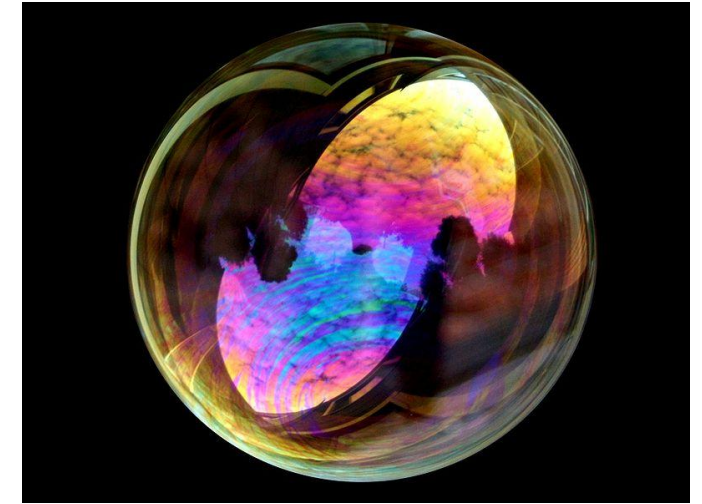
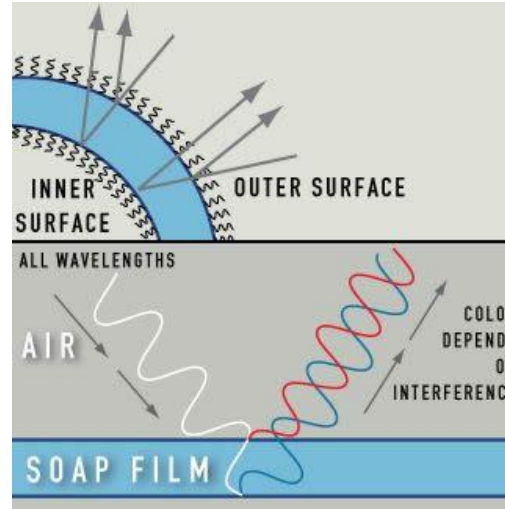
# Többréses interferencia



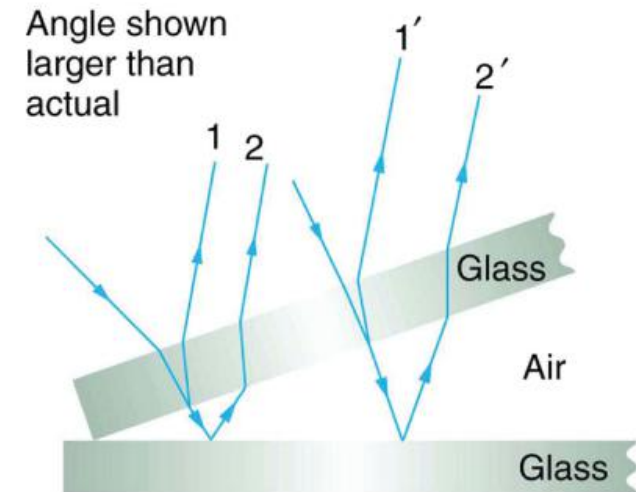
# Interferencia vékony rétegeken



$$\phi = 2\pi \left( \frac{b}{\lambda_a} \right) (n - 1)$$

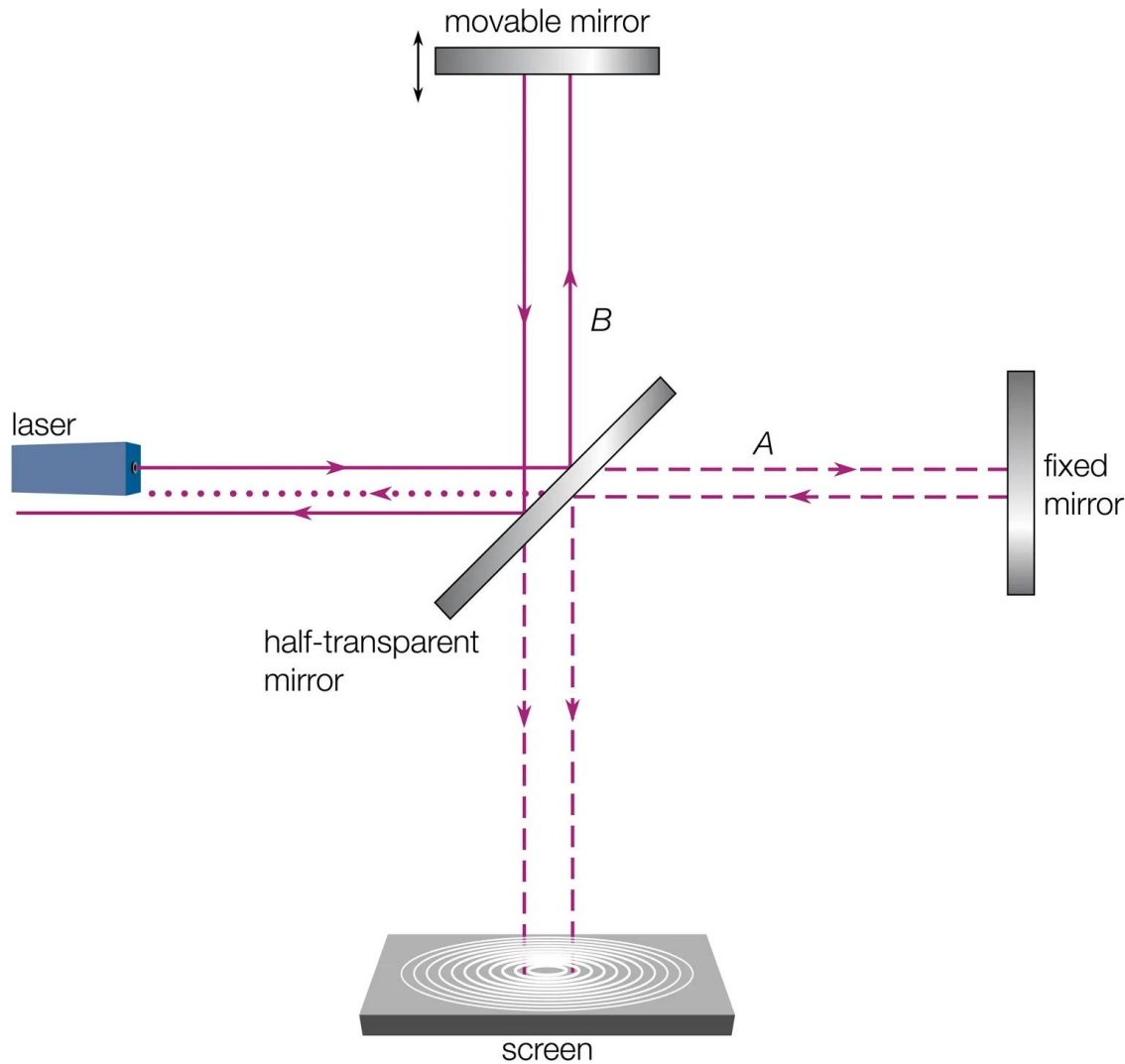


(a)

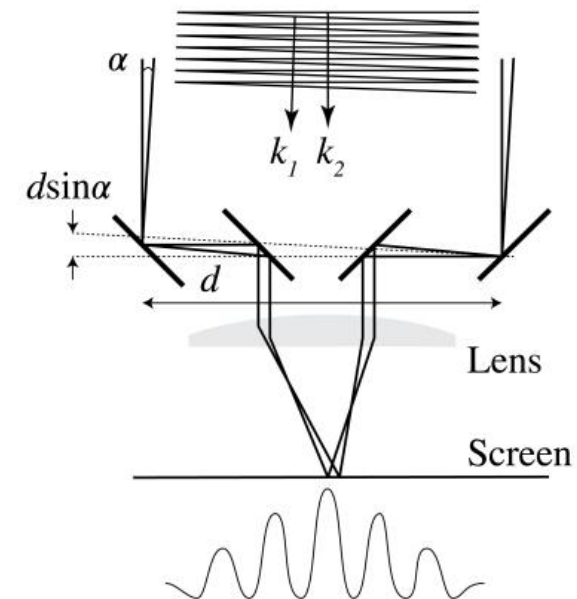
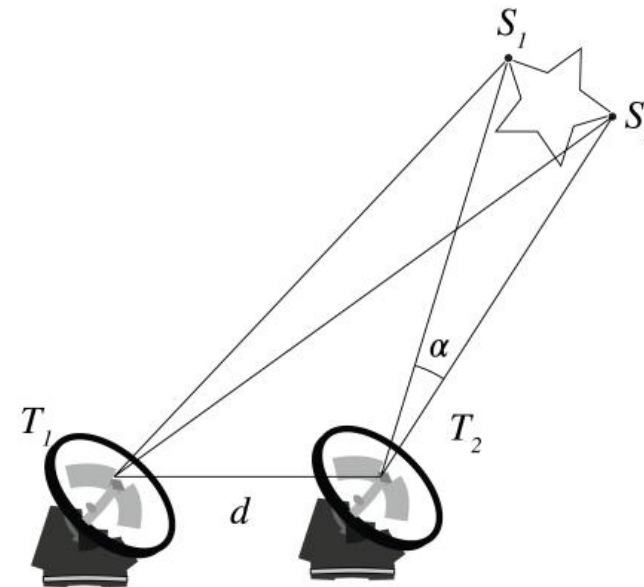


(b)

# Michelson interferometer



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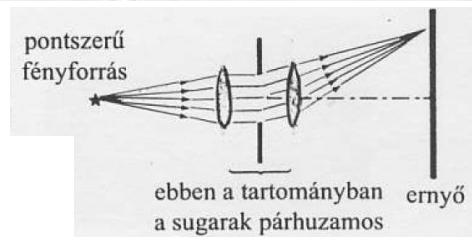
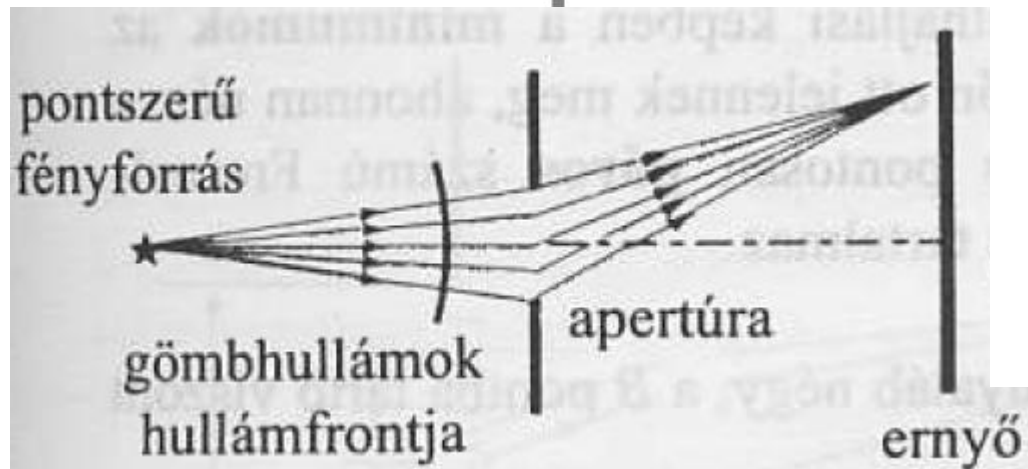
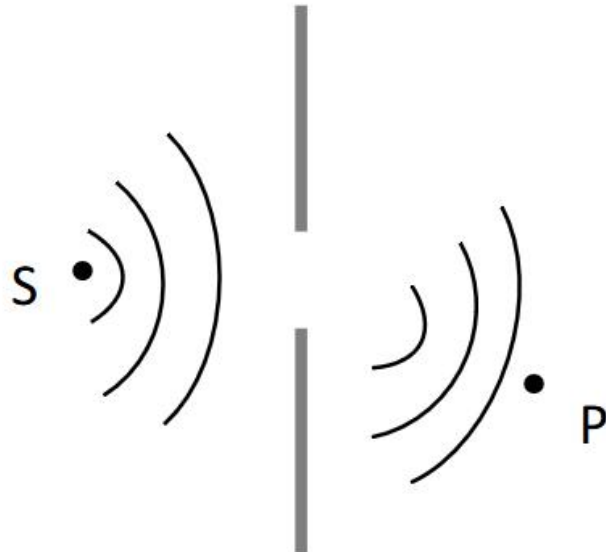




# Diffrakció - elhajlás

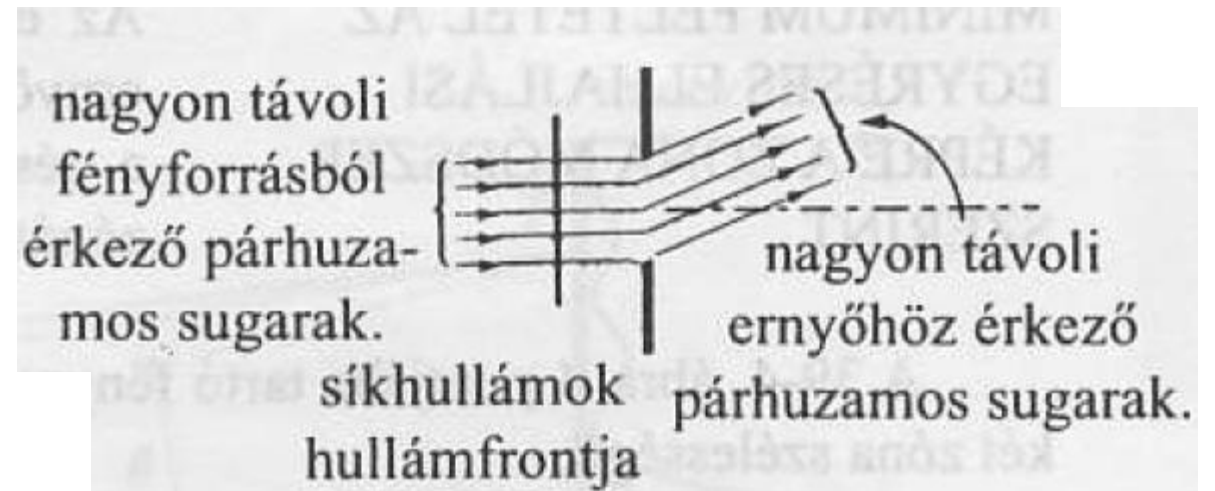
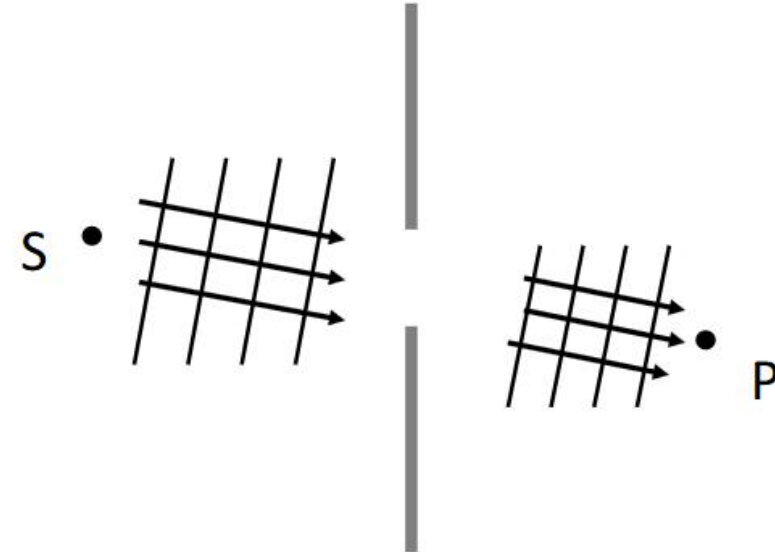


# Fresnel diffrakció

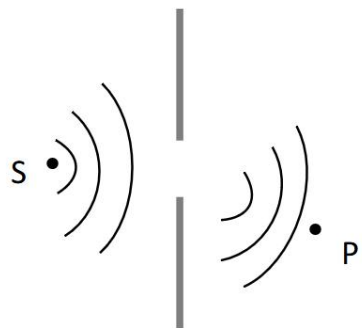


ebben a tartományban  
a sugarak párhuzamos

# Fraunhofer diffrakció

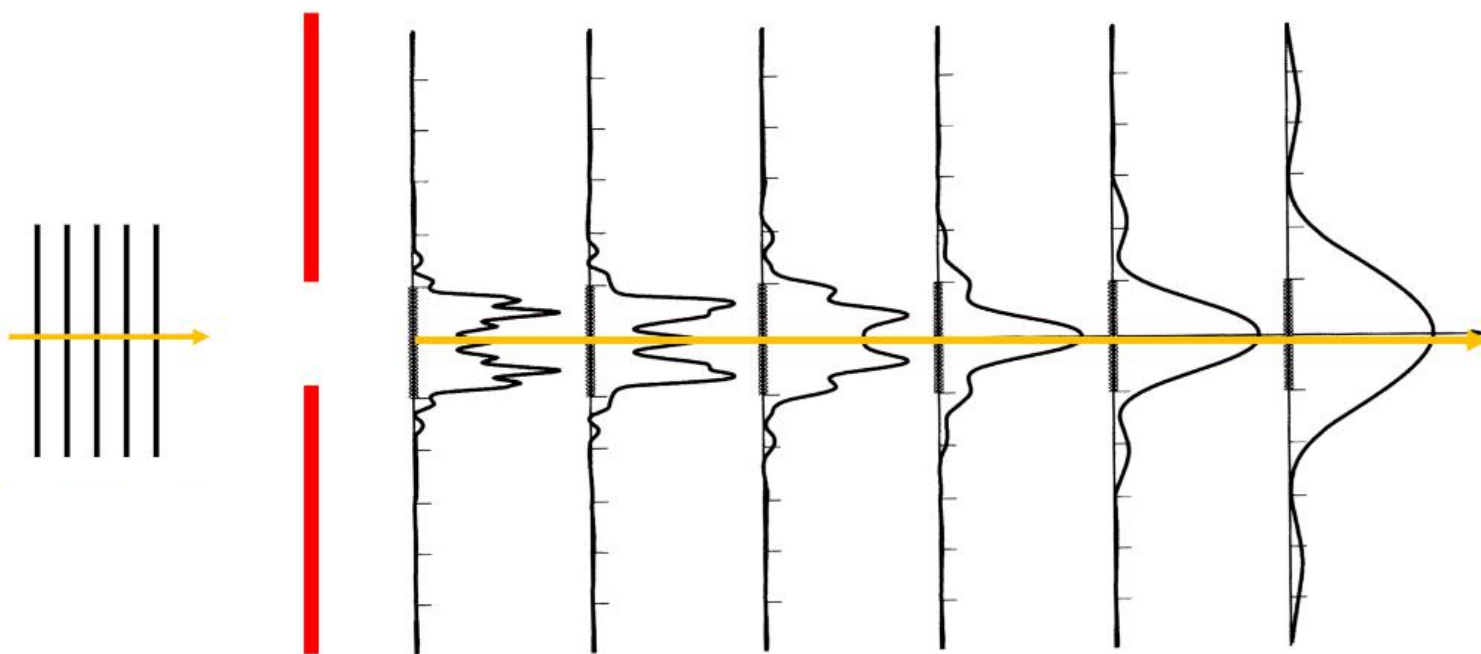
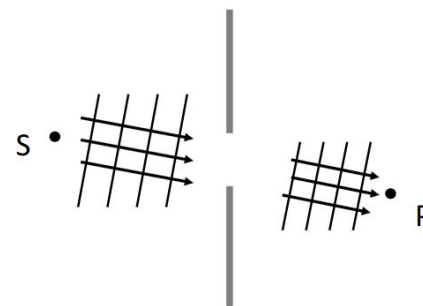


# Fresnel



$$F = \frac{h^2}{d\lambda}$$

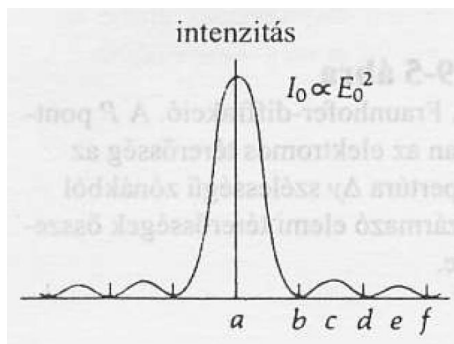
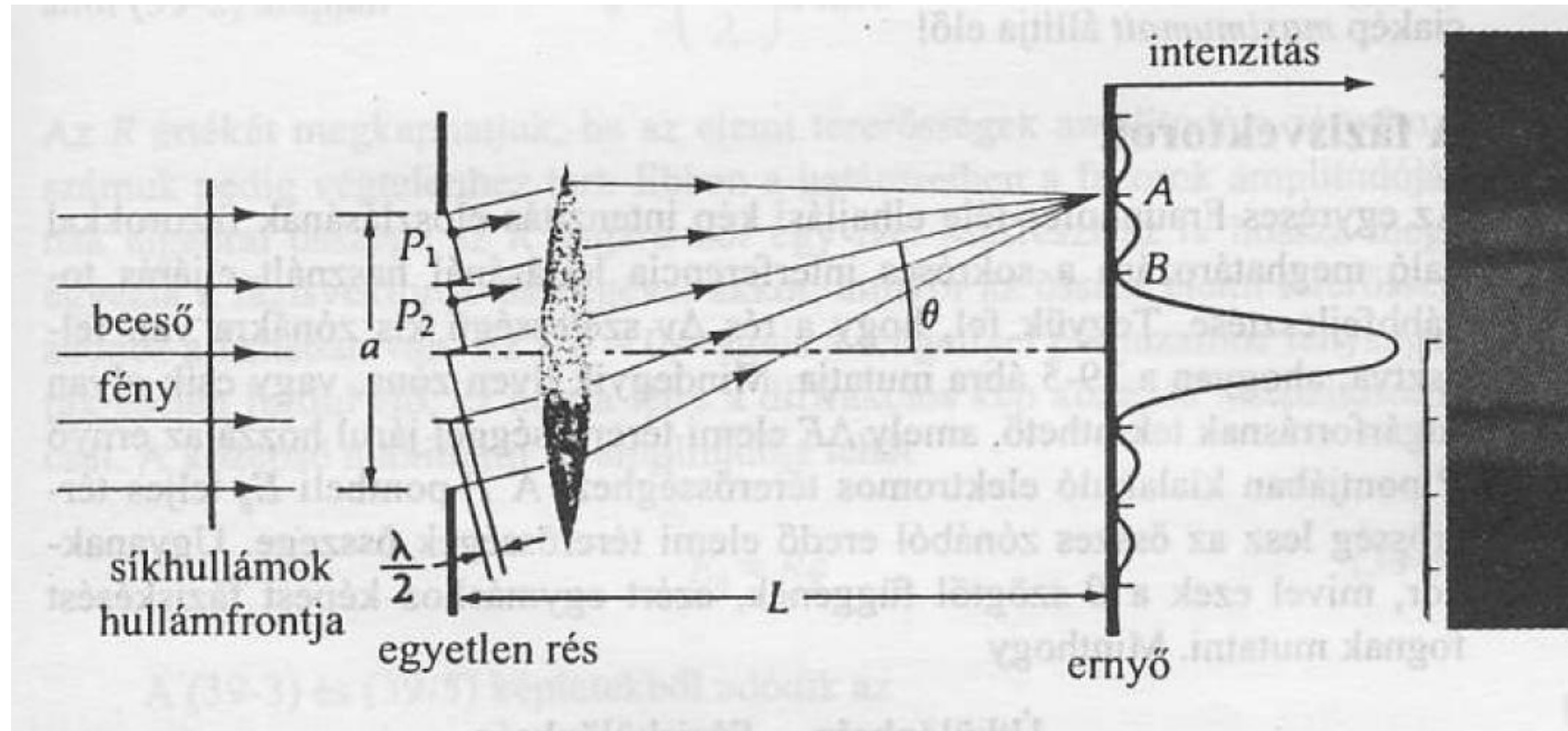
# Fraunhofer



$F \gg 1$

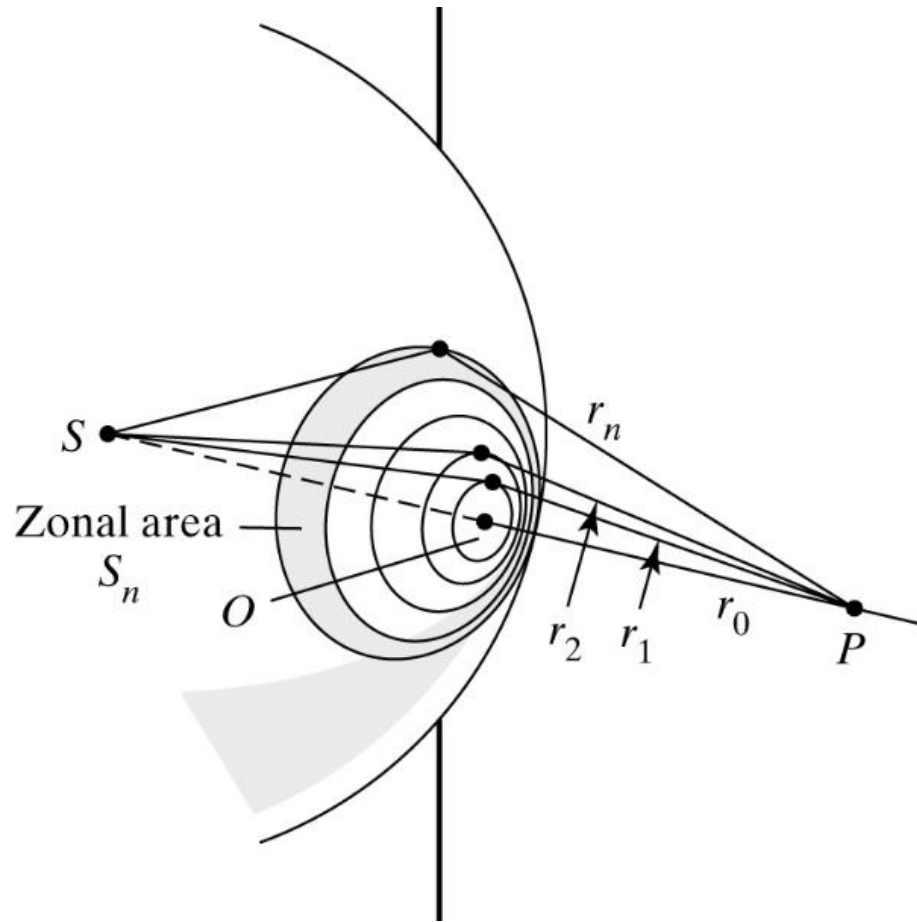
$F \ll 1$

# Fraunhofer diffrakció



$$I(\theta) = I_0 \left( \frac{\sin(\beta)}{\beta} \right)^2 \quad \beta = \frac{\pi a \sin \theta}{\lambda}$$

# Fresnel diffrakció



**zone spacing =  $\lambda/2$ :**

$$r_1 = r_0 + \lambda/2$$

$$r_2 = r_0 + \lambda$$

$$r_3 = r_0 + 3\lambda/2$$

$\vdots$

$$r_n = r_0 + n\lambda/2$$

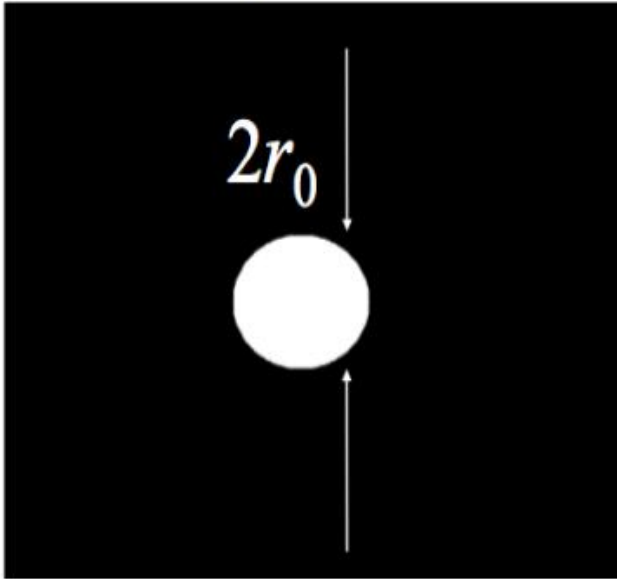
**these are called the  
*Fresnel zones***

**(note: all zones  
have equal areas)**



# Diffrakció kör alakú résen

Input field

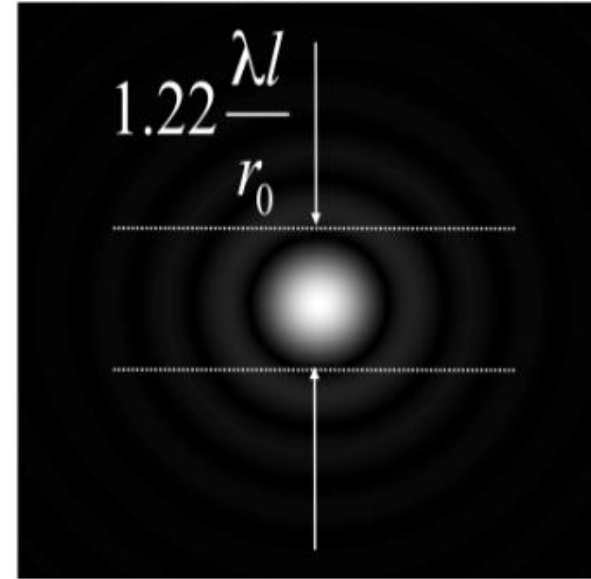


free space  
propagation by

$l \rightarrow \infty$



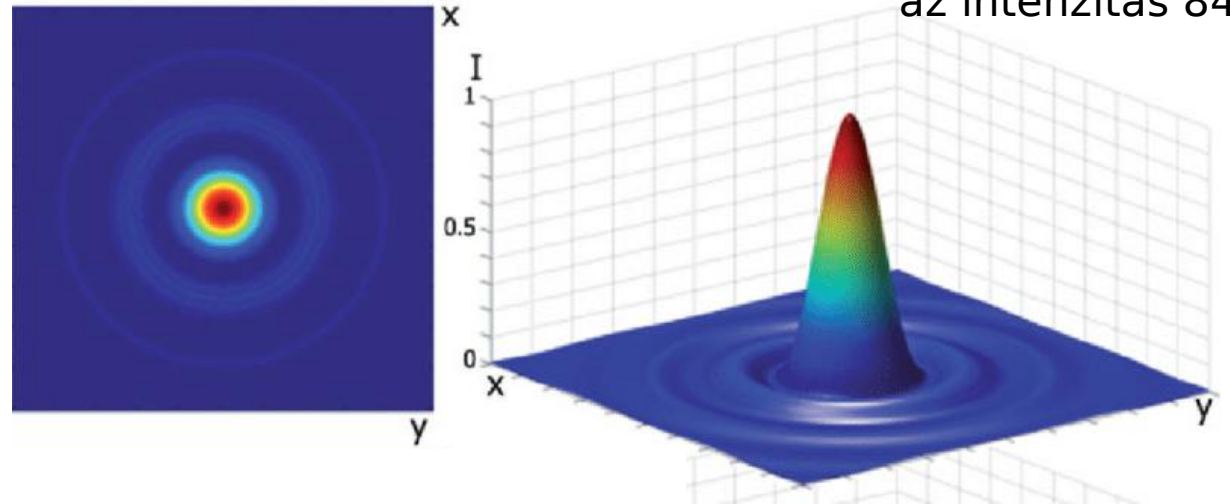
Far-field  
Airy pattern



Airy-korong:  
az intenzitás 84%-a

$$\sin \theta = p_m \frac{\lambda}{D}$$

$$p_1 = 1.220, p_2 = 2.233, p_3 = 3.238, \\ p_4 = 4.241, p_5 = 5.243, \dots$$

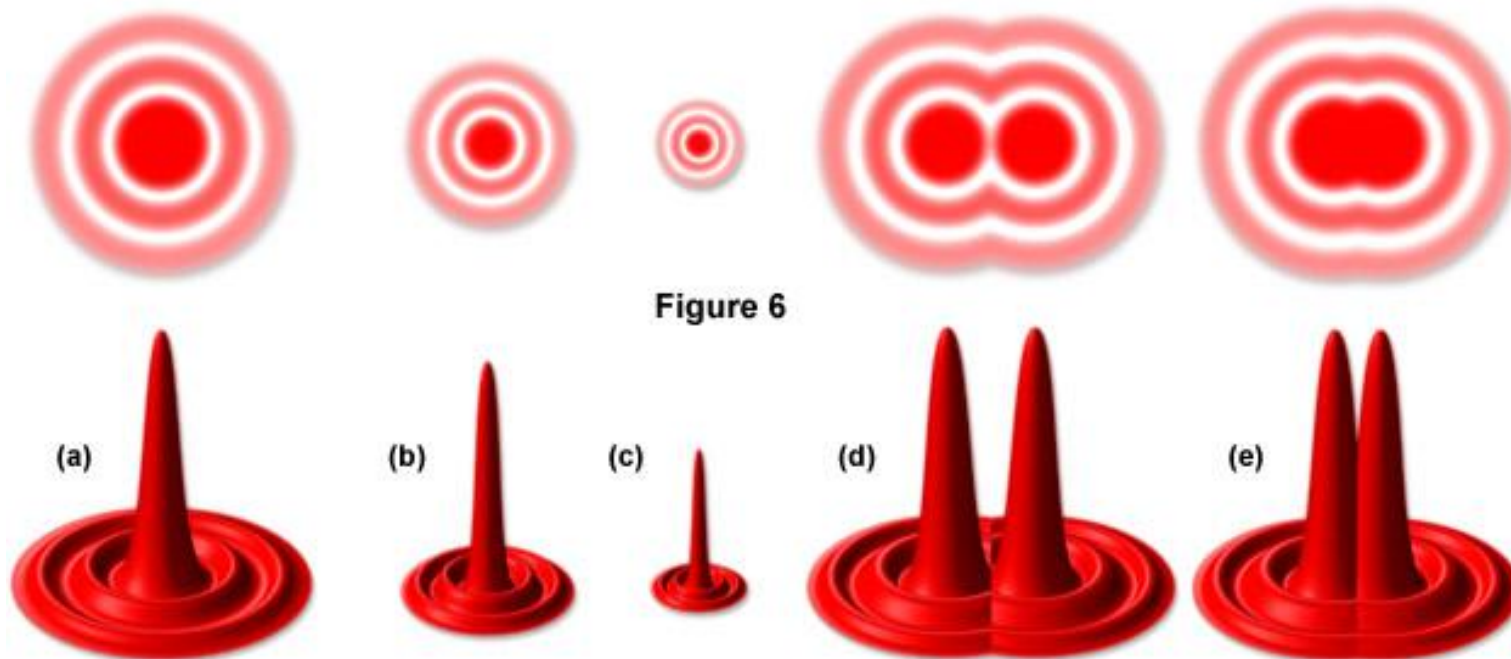


# Rayleigh kritérium

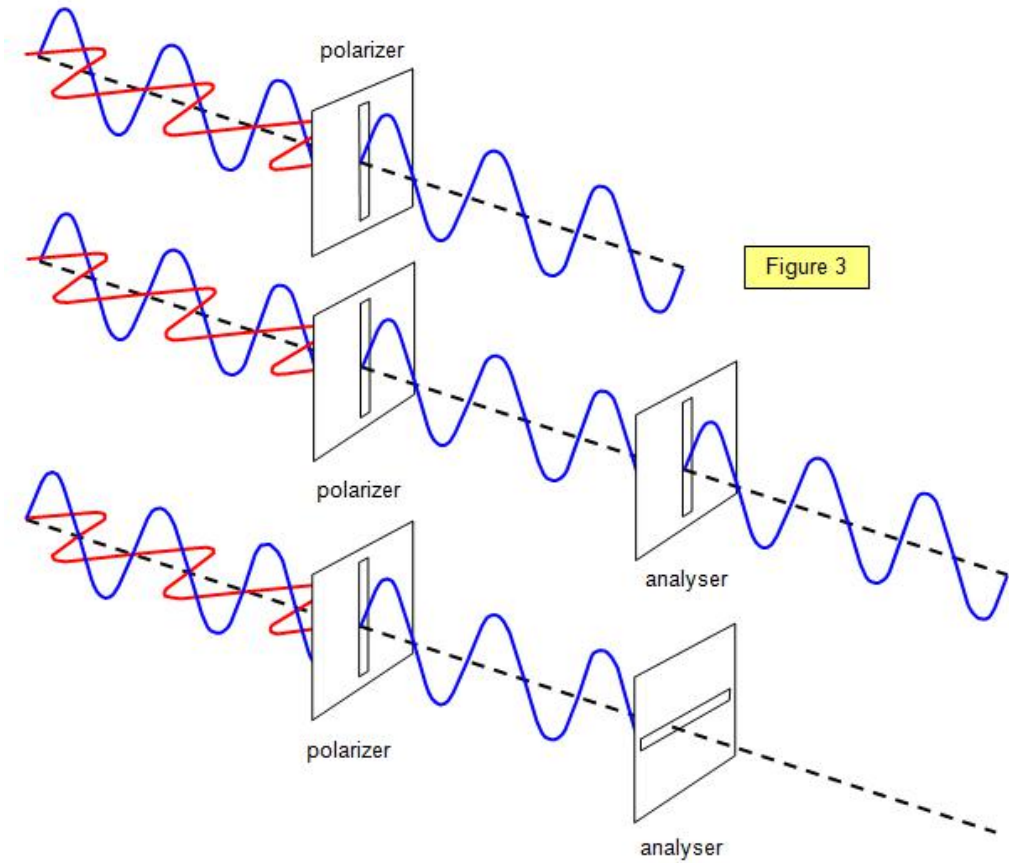
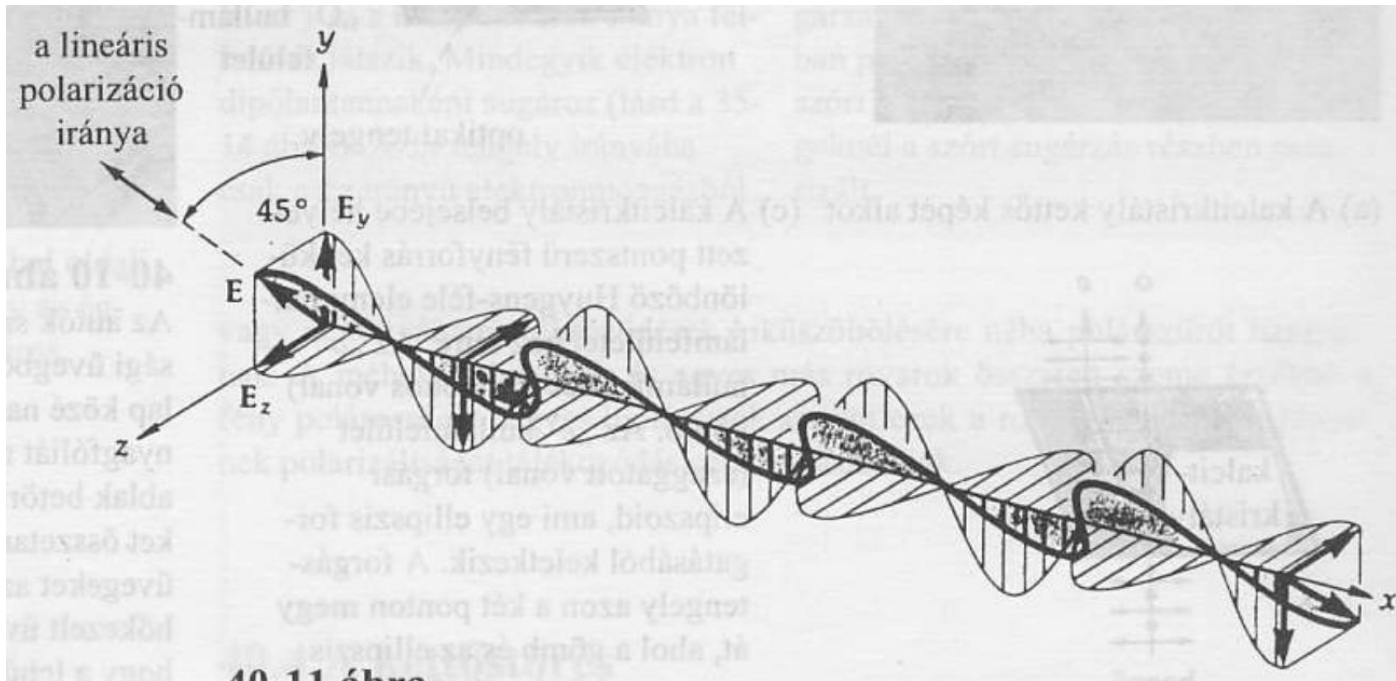
Két pontforrás akkor tekinthető éppen megkülönböztethetőnek (felbonthatónak), ha az egyik forrás Airy-korongjának központi maximuma egybeesik a másik forrás Airy-korongjának első minimumával:

$$\theta_R = 1.22 \frac{\lambda}{D}$$

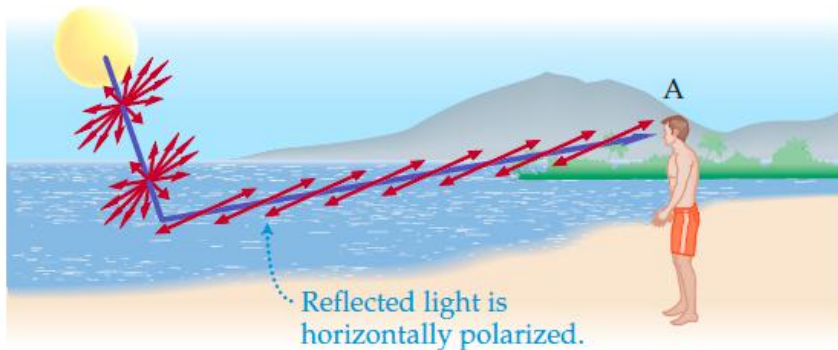
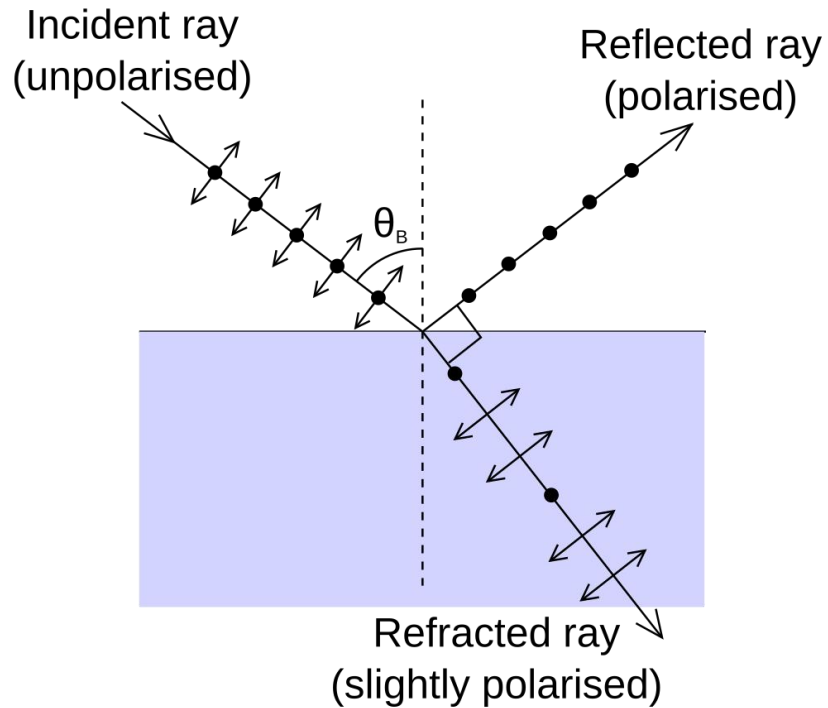
Airy Disks and Resolution According to the Rayleigh Criterion



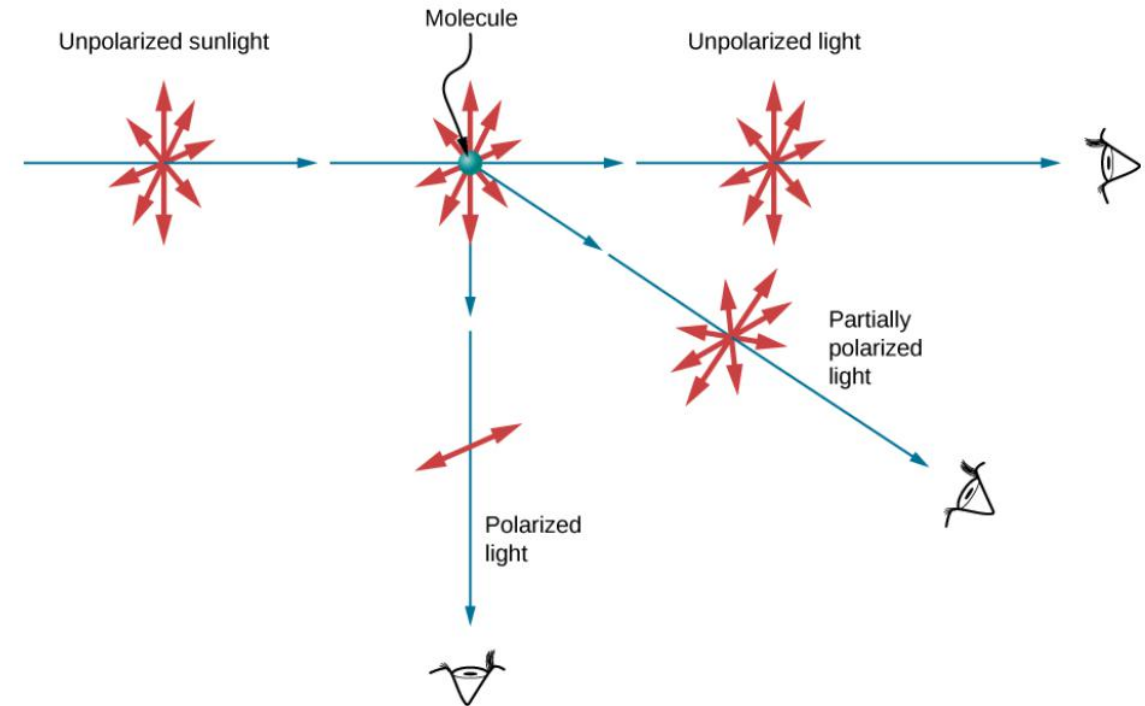
# Polarizáció



# Visszaverődési polarizáció Brewster szög

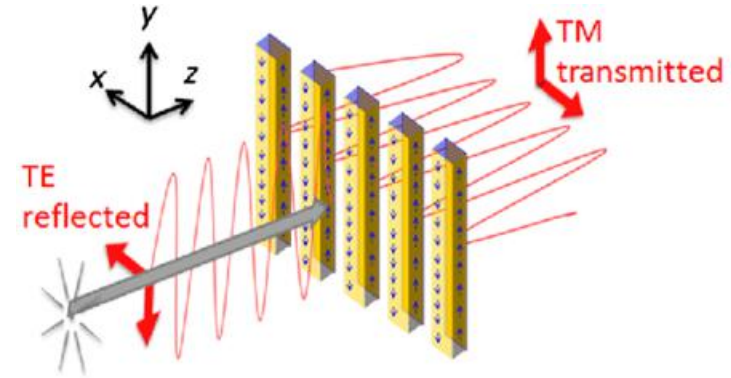


# Szórási polarizáció

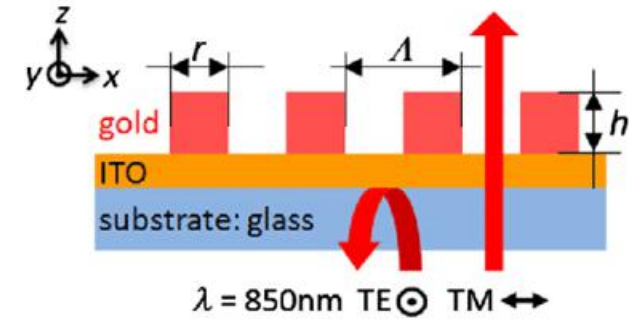




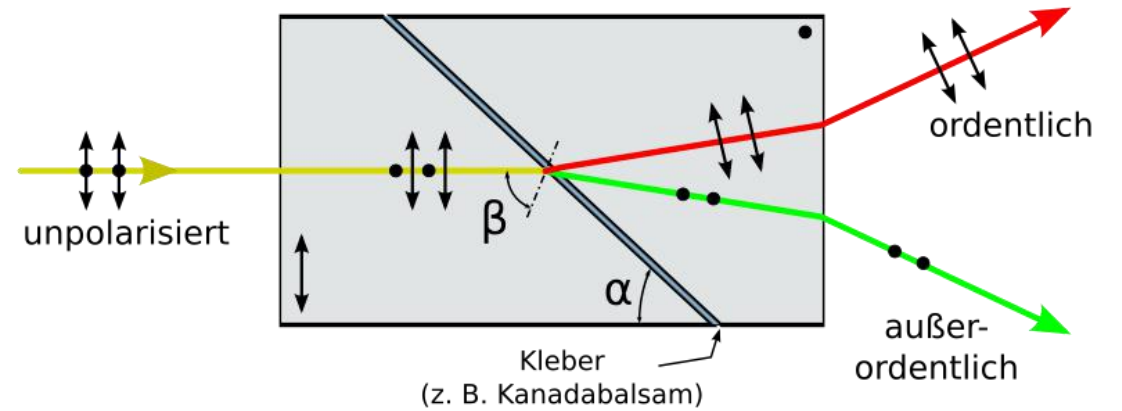
# Polárszűrő



(a)

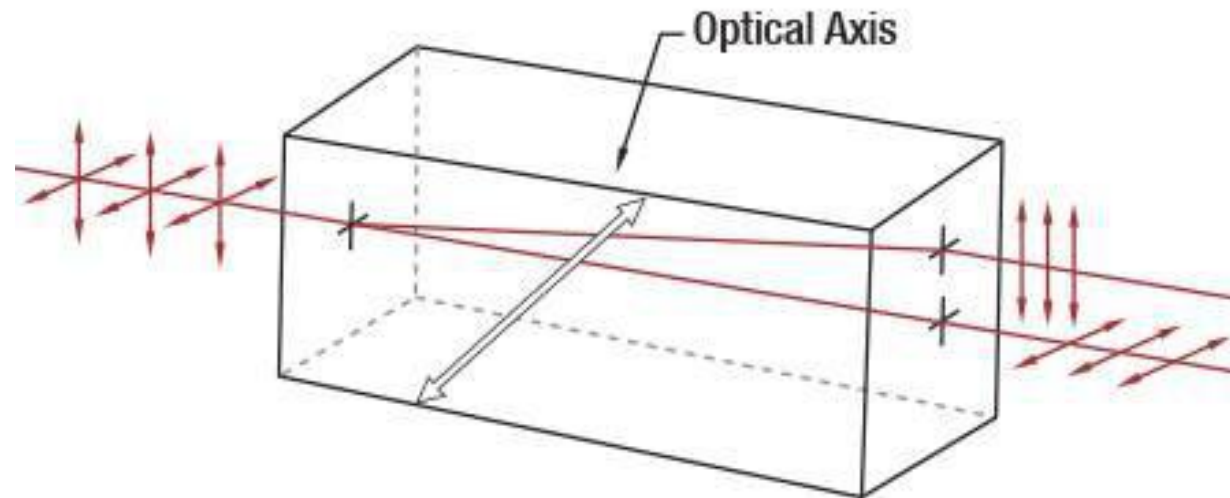
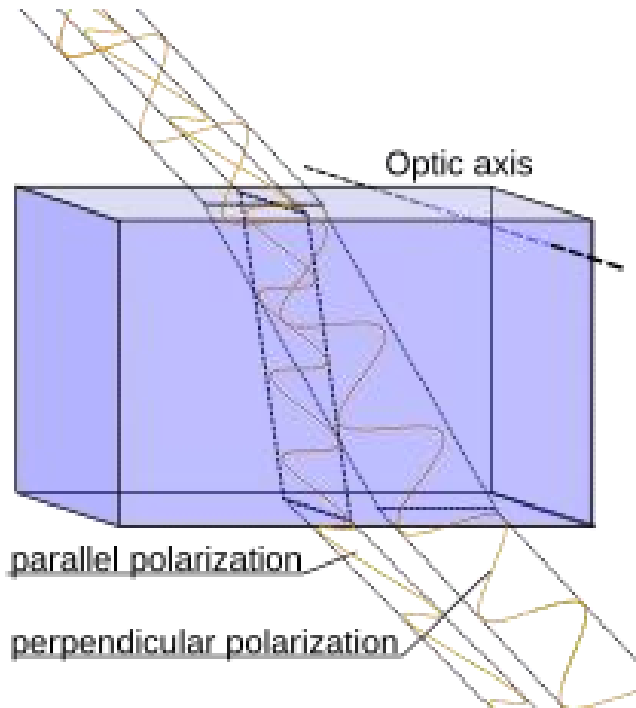


(b)





# Kettőstörés



# Fázistoló lemez

