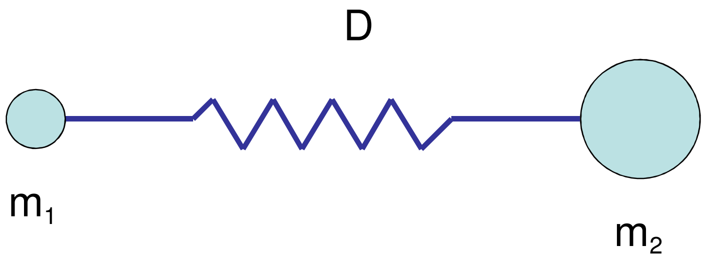
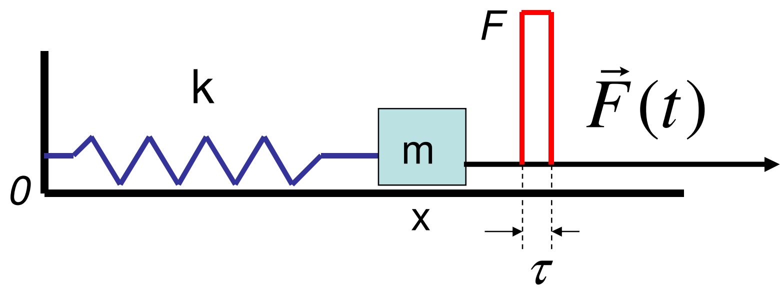
Óravázlat 12. előadás

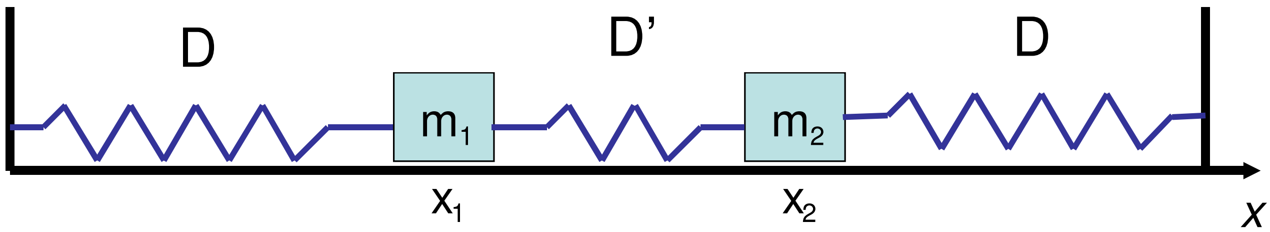
Molekula rezgés



Dirac delta:

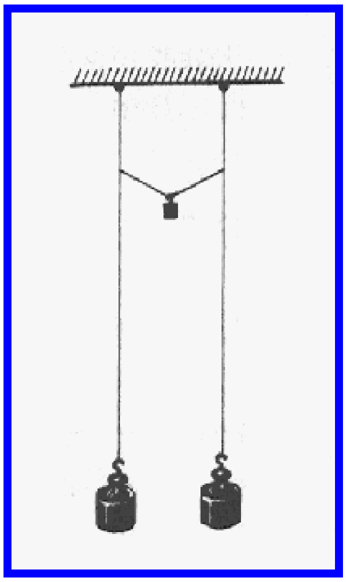


Csatolt rezgés



$$I.\quad m_1\ddot{x}_1 = -Dx_1 + D'(x_2 - x_1)$$

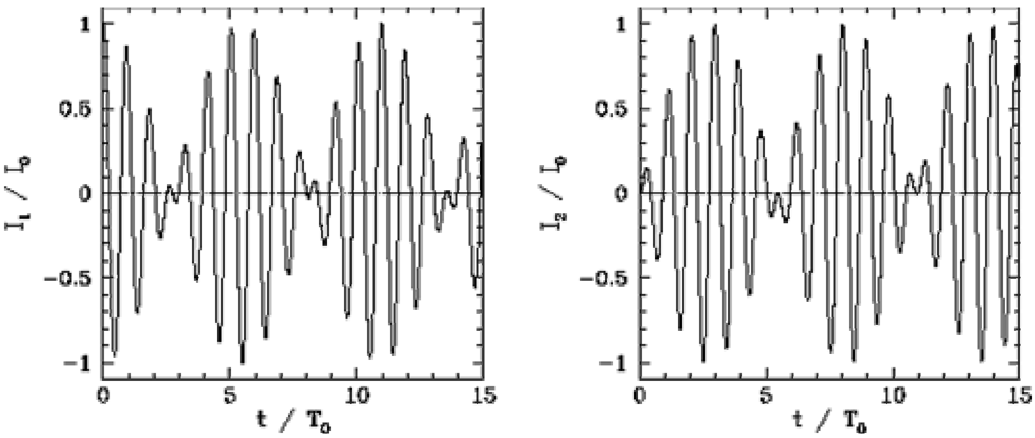
$$II.\quad m_2\ddot{x}_2 = D(\ell - x_2) - D'(x_2 - x_1)$$



megoldás:

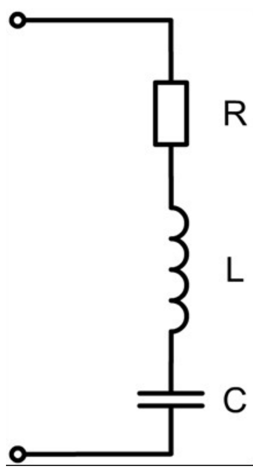
$$x_1 = C\cos\left(\frac{\omega-\omega_o}{2}t\right)\cos\left(\frac{\omega+\omega_o}{2}t\right)$$

$$x_2 = C\sin\left(\frac{\omega-\omega_o}{2}t\right)\sin\left(\frac{\omega+\omega_o}{2}t\right)$$



RLC kör

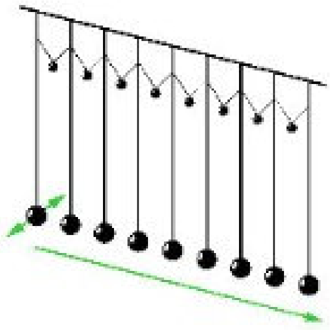
U(t)=U$_o$sin(ωt)

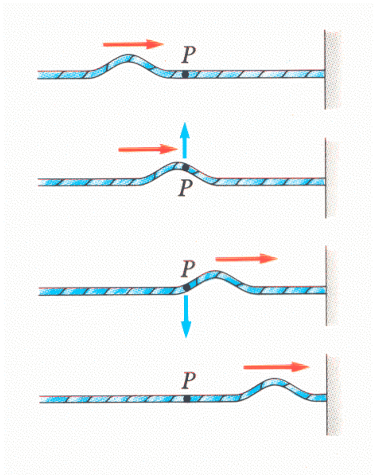


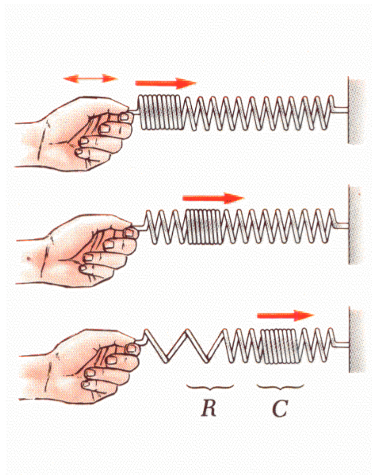
$$Z = \sqrt{\left(R^2 + (X_C - X_L)^2\right)}$$

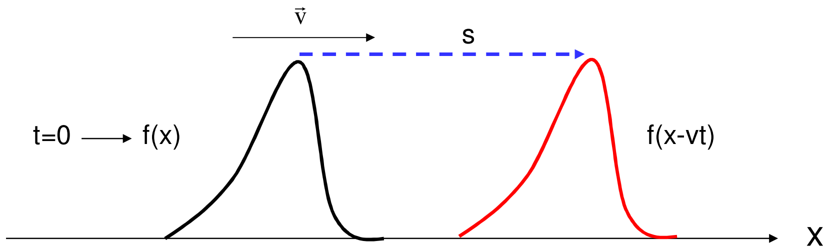
$$\varphi = arctg\left(\frac{X_C - X_L}{R}\right)$$

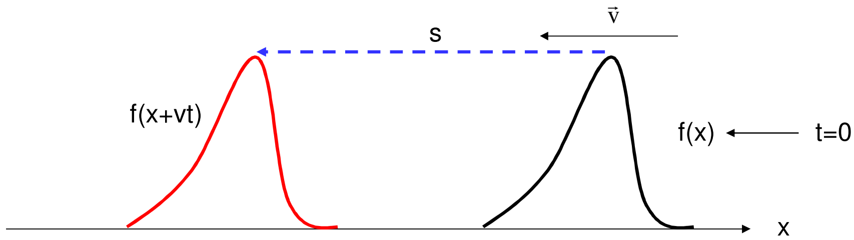
Hullámok

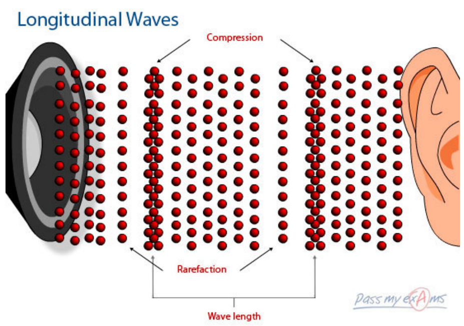


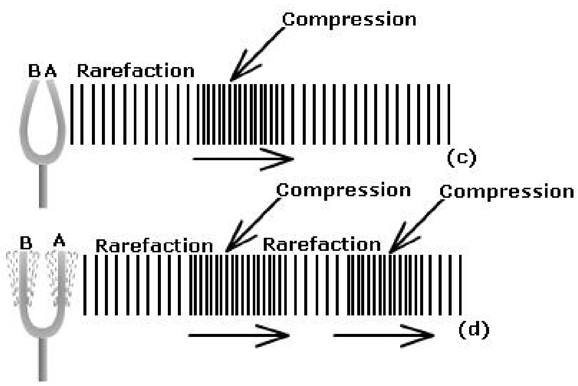

P
P
P
P

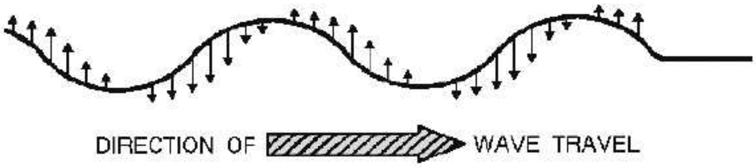

R
C

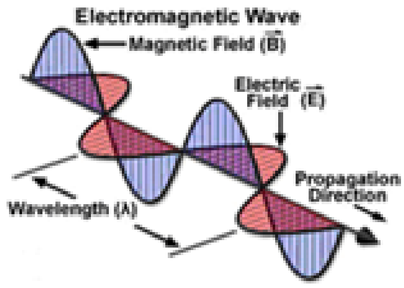

v⃗
s
t=0
f(x)
f(x-vt)
x


s
v⃗
f(x+vt)
f(x)
t=0
x

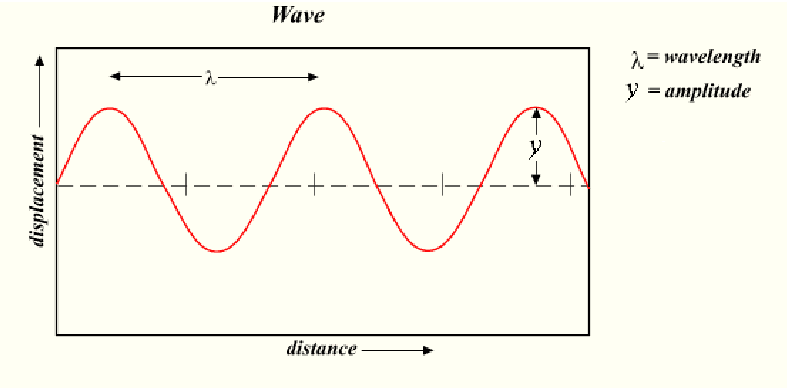

Longitudinal Waves
Compression
Rarefaction
Wave length

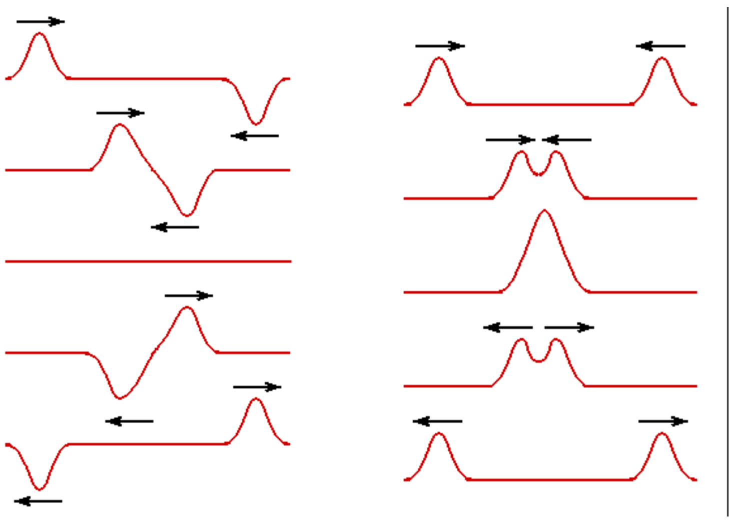

Compression
B A
Rarefaction
(c)
Compression
Compression
B
A
Rarefaction
Rarefaction
(d)

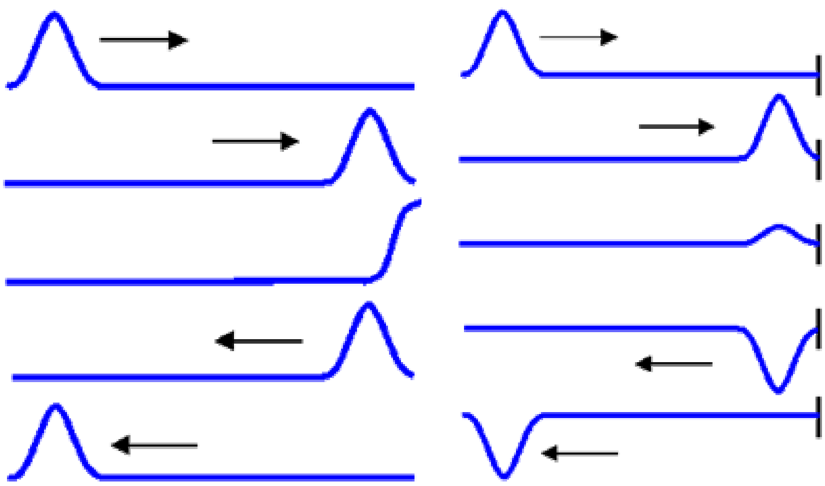




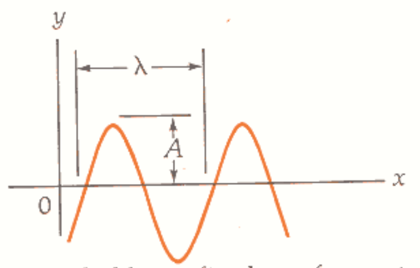
Színuszos hullám



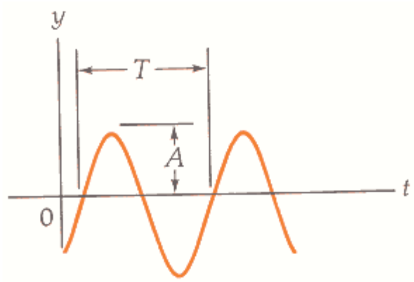




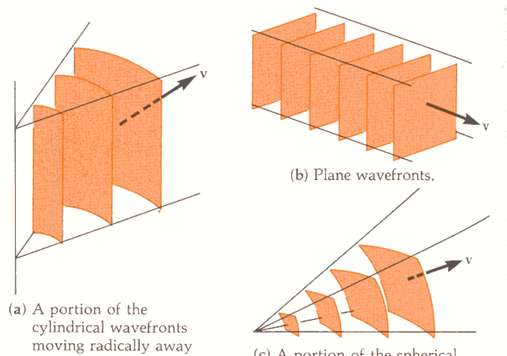
Ábrázolás:



(a) By holding t fixed, we focus attention on the (instantaneous) transverse displacement of the string along its entire length. The wavelength λ is the distance between two adjacent points that are in the same phase.



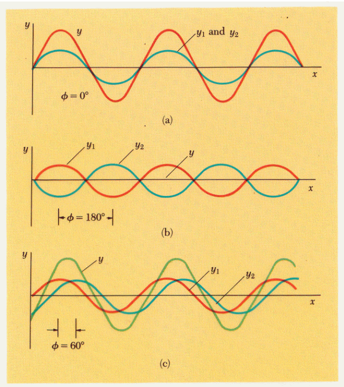
(b) By holding x fixed, we look at the transverse motion in time of the part of the string located at the point x. It undergoes SHM in the y direction. The period T is the time required for one complete vibration.

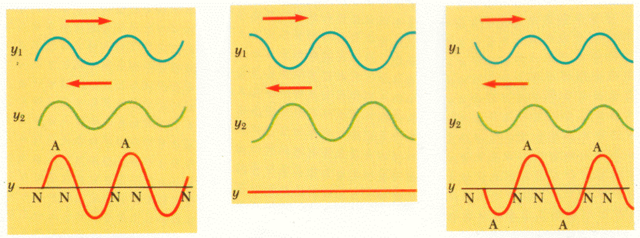


(a) A portion of the cylindrical wavefronts moving radically away from a line source.

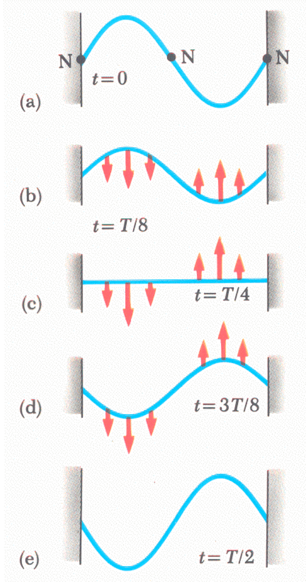
(b) Plane wavefronts.

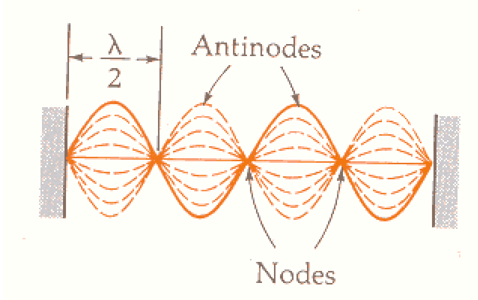
(c) A portion of the spherical wavefronts moving away from a point source.

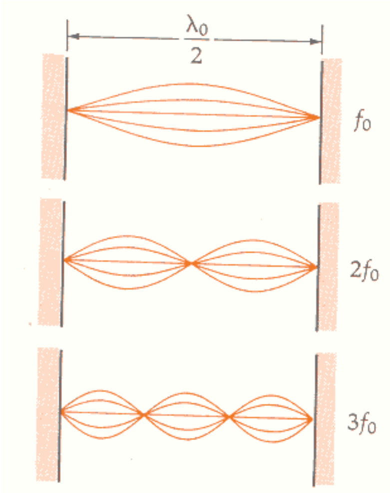


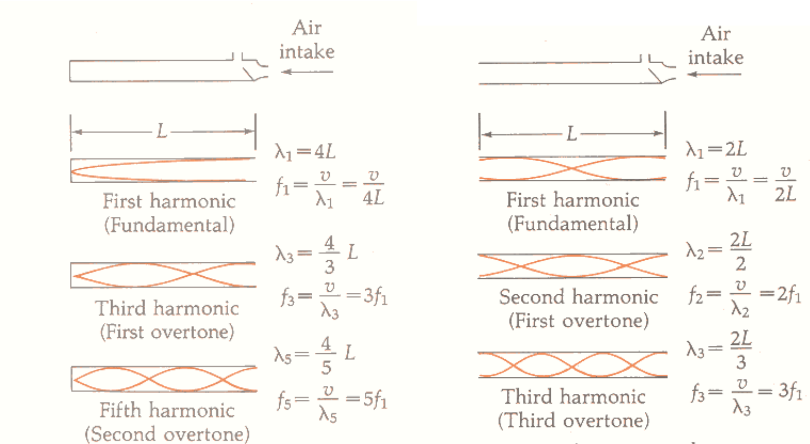


(a) $t = 0$ (b) $t = T/4$ (c) $t = T/2$



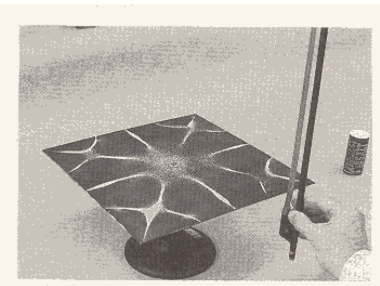






(a) A closed-end organ pipe has natural frequencies of $f_1, 3f_1, 5f_1, \ldots$

(b) An open-end organ pipe has natural frequencies of $f_1, 2f_1, 3f_1, \ldots$



(c) An antinode appears where the moving bow contacts the plate.