Strengens utsving : $y(x,t) = \begin{cases} y_i(x,t) + y_r(x,t) & x \leq 0 \\ y_t(x,t) & x \geq 0 \end{cases}$

Må tilfredsstille <u>alle</u> fysiske betingelser <u>til enhver tid</u>.
Kun mulig dersom

$$\omega_i = \omega_r = \omega_t$$

og $$\varphi_i = \varphi_r = \varphi_t$$

Setter $\omega_i = \omega$ og velger $\varphi_i = 0$

$$\Rightarrow y_i(x,t) = y_{io} \sin(k_i x - \omega t)$$
$$y_r(x,t) = y_{ro} \sin(k_i x + \omega t) \qquad \left(v_r = v_i \Rightarrow k_r = \frac{\omega}{v_r} = \frac{\omega}{v_i} = k_i\right)$$
$$y_t(x,t) = y_{to} \sin(k_t x - \omega t)$$

y kontinuerlig i $x=0$ $\Rightarrow -y_{io} \sin \omega t + y_{ro} \sin \omega t = -y_{to} \sin \omega t$

$$\Rightarrow y_{io} - y_{ro} = y_{to}$$

$\partial y / \partial x$ kont. i $x = 0$ $\Rightarrow k_i y_{io} \cos \omega t + k_i y_{ro} \cos \omega t = k_t y_{to} \cos \omega t$
(egentlig: $S \cdot \partial y / \partial x$!!)

$$\Rightarrow k_i y_{io} + k_i y_{ro} = k_t y_{to}$$

$$\Rightarrow y_{ro} = \frac{k_t - k_i}{k_t + k_i} y_{io} \; ; \qquad y_{to} = \frac{2k_i}{k_t + k_i} y_{io}$$

Med $k_i = \omega / v_1$, $k_t = \omega / v_2$, $v_1 = \sqrt{S/\mu_1}$ og $v_2 = \sqrt{S/\mu_2}$:

$$\boxed{y_{ro} = \frac{\sqrt{\mu_2} - \sqrt{\mu_1}}{\sqrt{\mu_2} + \sqrt{\mu_1}} y_{io} \; ; \quad y_{to} = \frac{2\sqrt{\mu_1}}{\sqrt{\mu_2} + \sqrt{\mu_1}} y_{io}}$$