

m[kg]	T[N]	v[m/s]	v[m/s]		1	2	3	4	5
0,456	4,473	59,81		calculated	29,905	59,81	19,175	119,162	139,525
0,709	6,195	74,59		experimental	30,6	60,02	91,0	122,0	153
				calculated	37,795	74,59	111,115	149,138	186,425
				experimental	37,7	75,1	112,16	150,5	189,13
m[kg]	T[N]	v[m/s]	λ [m]		1	2	3	4	5
0,456	4,473	59,81		calculated	2	1	0,66	0,15	0,19
				experimental	1,99	0,99	0,65	0,149	0,39
0,709	6,195	74,59		calculated	2	1	0,66	0,15	0,19
				experimental	1,97	0,95	0,66	0,149	0,139

$L = 2m$
 Cu
 $\sigma = 456 = m$
 $m = 253$

$T = m \cdot g$
 $g = 9,82$

$v = \sqrt{\frac{T}{\mu}}$
 $\mu = 1,25 \text{ g/m}$

$v = \frac{1}{2L} \sqrt{\frac{T}{\mu}}$
 $n = 1,2,3,4,5$

δf

Lab 3

Lab 2. Experimental Study of Transverse Standing waves

$$L = 2 \text{ m}$$

Cu

$$C_E \rightarrow m_1 = 456 \text{ g}$$

$$C_E \rightarrow m_2 = m_1 + 253 \text{ g}$$

$$K g \cdot \frac{m}{s^2}$$

$$T_1 = m_1 \cdot g, (N) = 0.456 \text{ kg} \cdot 9.81 = 4.473, 36 (N)$$

$$g = 9.81 \text{ m/s}^2$$

$$T_2 = m_2 \cdot g (N) = 0.709 \cdot 9.81 = 6.95729 (N)$$

$$v_1 = \sqrt{\frac{T_1}{\mu}} = \sqrt{\frac{4.473}{1.25}} = 59.81$$

$$v_2 = \sqrt{\frac{T_2}{\mu}} = \sqrt{\frac{6.955}{1.25}} = 74.59$$

$$\mu = 1.25 \text{ g/m}$$

$$v_1 = \frac{n}{2L} \cdot \sqrt{\frac{T_1}{\mu}}$$

$$v_2 = \frac{n}{2L} \cdot \sqrt{\frac{T_2}{\mu}}$$

$$n = \{1, 2, 3, 4, 5\}$$

$$n=1 \Rightarrow v_1 = 29.905$$

$$n=2 \Rightarrow 59.81$$

$$n=3 \Rightarrow 89.715$$

$$n=4 \Rightarrow 119.62$$

$$n=5 \Rightarrow 149.525$$

$$n=1 \Rightarrow v_2 = 37.295$$

$$n=2 \Rightarrow v_2 = 74.59$$

$$n=3 \Rightarrow v_2 = 111.885$$

$$n=4 \Rightarrow v_2 = 149.17$$

$$n=5 \Rightarrow v_2 = 186.465$$

$$\rightarrow v \in (20 \text{ Hz} - 20.000 \text{ Hz})$$

$$\rightarrow t \geq 0.05 \text{ s}$$

$$\Psi(x,t) = \Psi_T(x,t) + \Psi_R(x,t)$$

GROUP

n	1	2	3	4	5	6	7	8
$v_n^{exp} (Hz)$	1015	2116	3116	4119	5113	6412	7314	8412
$v_n^{theor} (Hz)$	21,53	42,16	64,63	86,17	107,7	129,2	150,8	172,3

$$m = 86 \text{ g}$$

$$v = L \cdot \sqrt{\frac{K}{m}}$$

$$L = 69 \text{ cm}$$

$$K = 76,05 \text{ N/m}$$

$$d = 13 \text{ mm}$$

$$v = \frac{d}{2L} \sqrt{\frac{K}{m}}$$

$$v_1 = \frac{10^2}{2 \cdot 69} \cdot \sqrt{\frac{76,05}{0,086}} = 0,724 \cdot 29,73 = 21,53$$

$$v_2 = \frac{2 \cdot 10^2}{2 \cdot 69} \cdot \sqrt{\frac{76,05}{0,086}} = 1,449 \cdot 29,73 = 42,16$$

$$v_3 = \frac{3 \cdot 10^2}{2 \cdot 69} \cdot \sqrt{\frac{76,05}{0,086}} = 2,174 \cdot 29,73 = 64,63$$

$$v_4 = 86,17$$

$$v_5 = 107,71$$