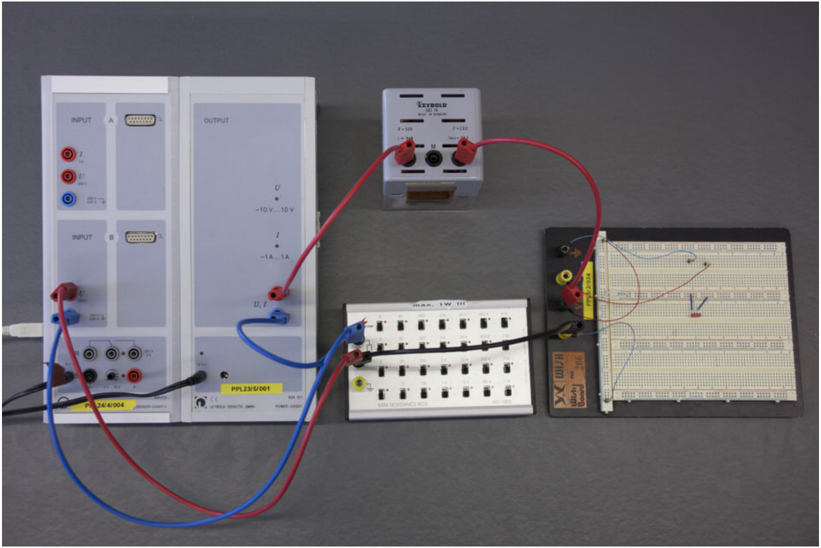
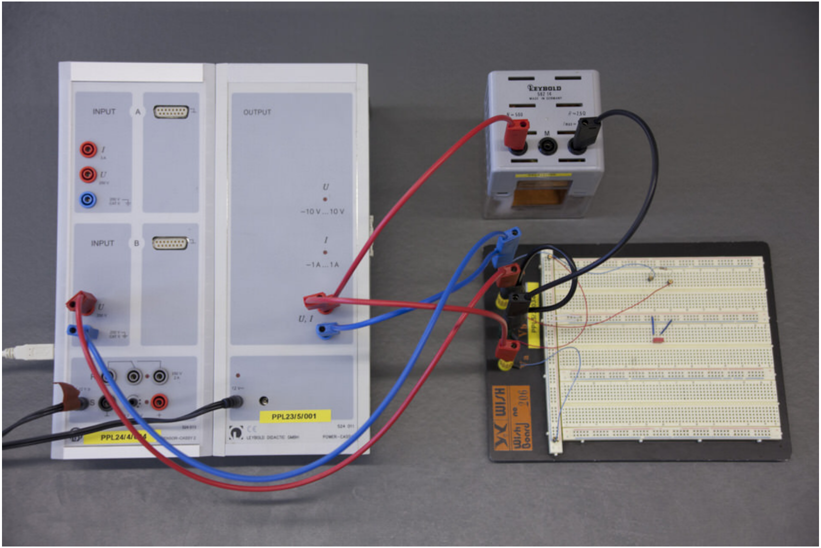
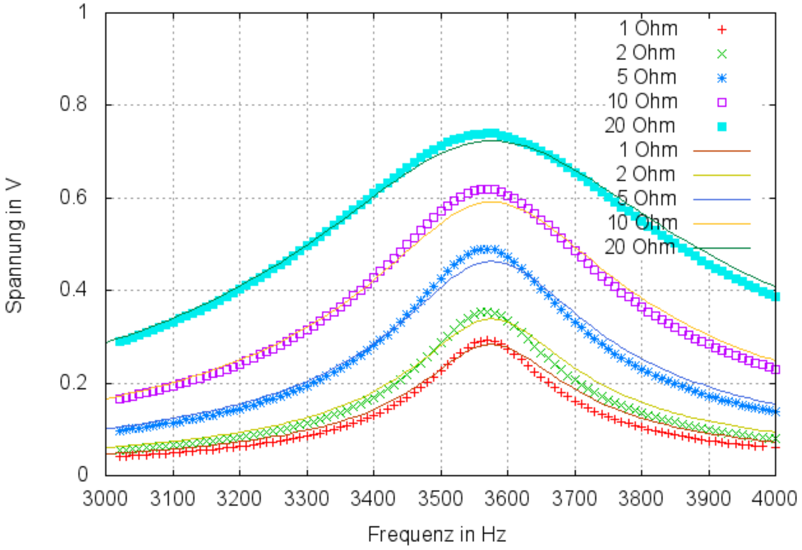
PP Gruppe 8

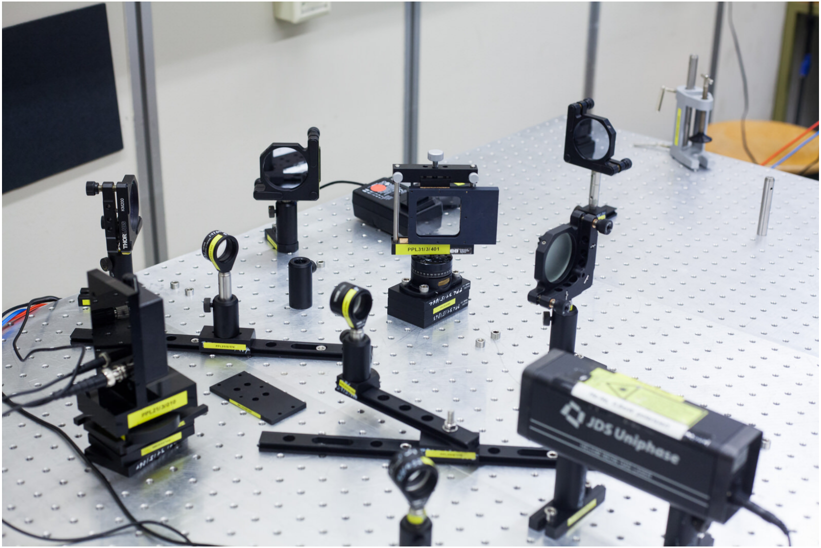
January 27, 2014


INPUT
A
INPUT
B
OUTPUT
−10 V ... 10 V
−1 A ... 1 A
U, I
PPL23/5/001

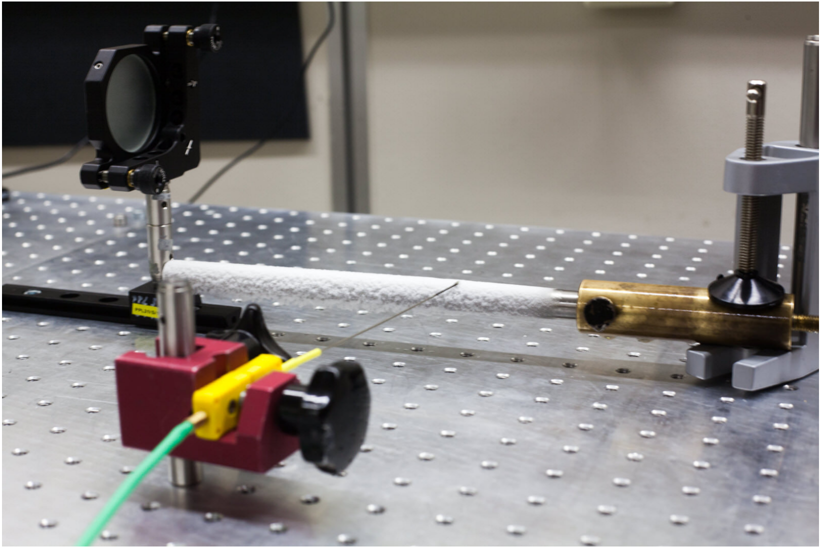

INPUT
A
INPUT
B
OUTPUT
U
−10 V ... 10 V
I
−1 A ... 1 A
U, I
PPL23/5/001
LEYBOLD
M
WISH
Wish Board

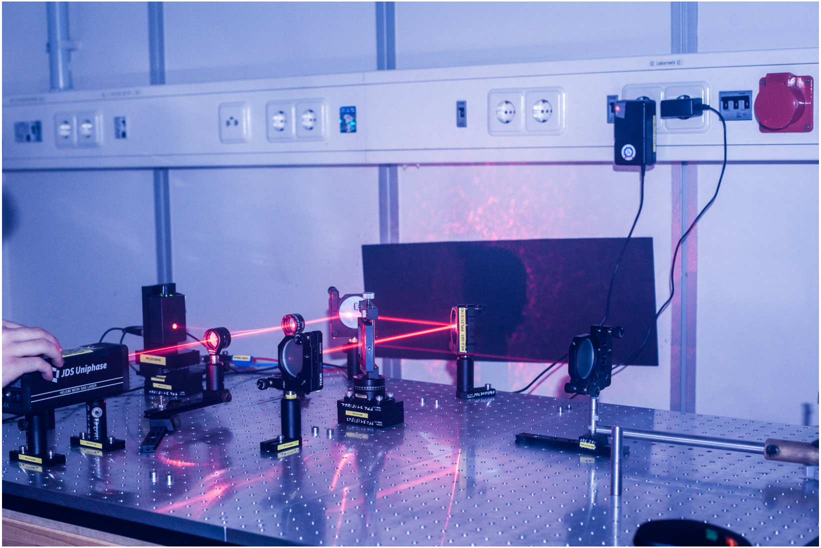


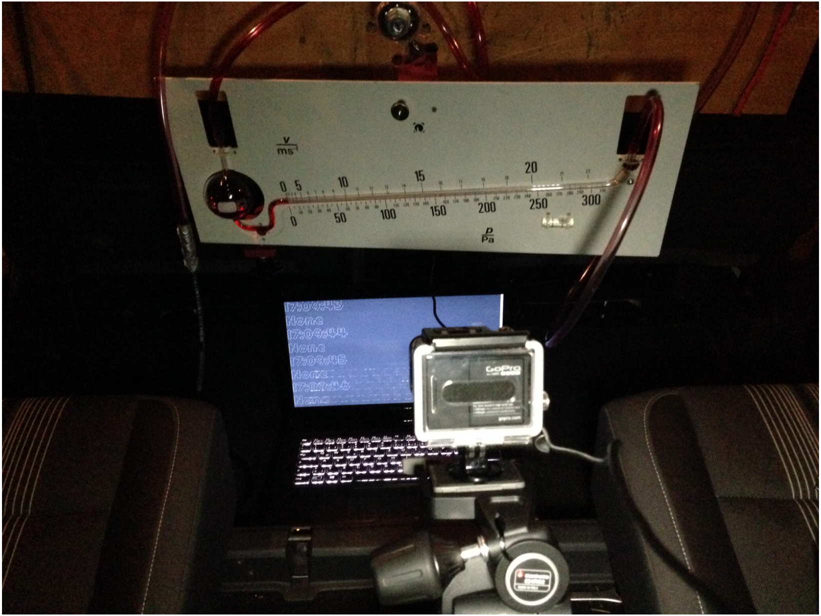
1
0.8
0.6
0.4
0.2
0
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
Spannung in V
Frequenz in Hz
1 Ohm
2 Ohm
5 Ohm
10 Ohm
20 Ohm
1 Ohm
2 Ohm
5 Ohm
10 Ohm
20 Ohm


THORLABS
PPL31/3/401
JDS Uniphase

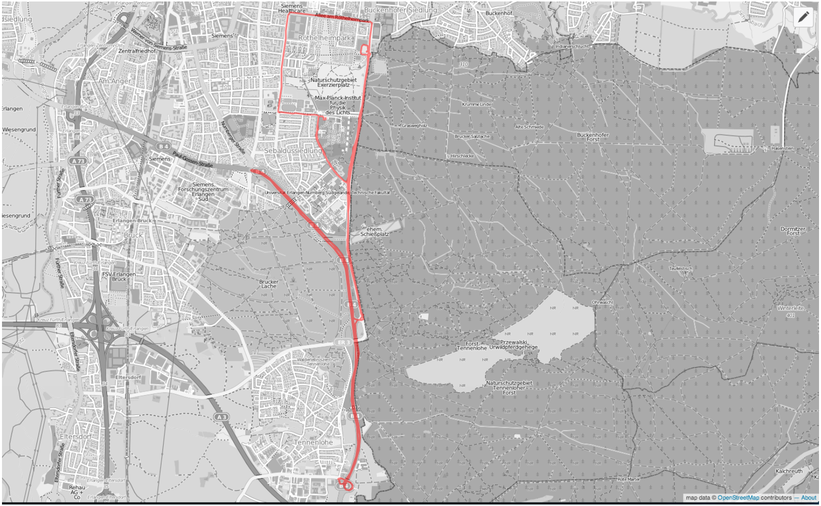

rotho




JDS Uniphase



v/ms⁻¹
0 5 10 15 20
0 50 100 150 200 250 300
p/Pa
GoPro


Siemens Healthcare
Allee am Röthelheimpark
Buckenhofer Siedlung
Buckenhof
Röthelheimpark
Siemens
Zentralfriedhof
Am Anger
Naturschutzgebiet Exerzierplatz
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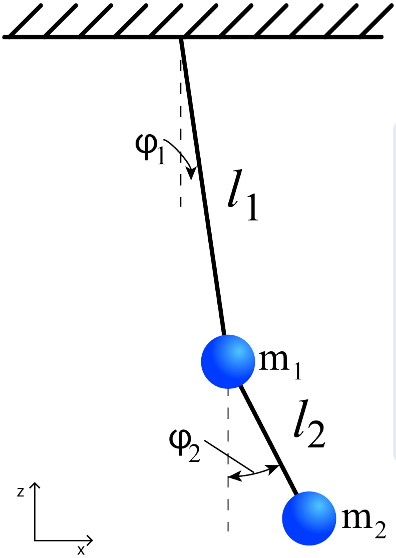
Bestimmung der Bewegungsgleichungen mit Hilfe des Lagrangeformalismus

$$\frac{d}{dt}\frac{\partial L}{\partial \dot{q}_i} - \frac{\partial L}{q_i} = 0 \quad (1)$$

$$L = \sum_i E_{kin,i} - V_i = \sum_i \frac{m_i}{2} \cdot \dot{\vec{x_i}}^2 - m_i \cdot g \cdot z_i \quad (2)$$



$$\vec{x_1} = l_1 \cdot \begin{pmatrix} \sin\varphi_1 \\ -\cos\varphi_1 \end{pmatrix} \tag{3}$$

$$\begin{aligned} \vec{x_2} &= \vec{x_1} + l_2 \cdot \begin{pmatrix} \sin\varphi_2 \\ -\cos\varphi_2 \end{pmatrix} \\ &= \begin{pmatrix} l_1 \cdot \sin\varphi_1 + l_2 \cdot \sin\varphi_2 \\ -l_1 \cdot \cos\varphi_1 - l_2 \cdot \cos\varphi_2 \end{pmatrix} \end{aligned} \tag{4}$$

Anwenden des Lagrange-Formalismus ergibt:

$$(m_1 + m_2) l_1 \ddot{\varphi}_1 + m_2 l_2 \ddot{\varphi}_2 \cos(\varphi_1 - \varphi_2) + m_2 l_2 \dot{\varphi}_2{}^2 \sin(\varphi_1 - \varphi_2) + \\ + (m_1 + m_2) g \; sin \varphi_1 = 0 \tag{5}$$

$$m_2 l_2 \ddot{\varphi}_2 + m_2 l_1 (\ddot{\varphi}_1 \cos(\varphi_1 - \varphi_2) - \dot{\varphi}_1{}^2 \sin(\varphi_1 - \varphi_2)) + m_2 g \sin \varphi_2 = 0 \tag{6}$$