Khemis Miliana University
Faculty of Science and Technology
Department of Sciences of the Matter

جامعة الجيلالي بونعامة خميس مليانة
كلية العلوم والتكنولوجيا
قسم علوم المادة

L1 Sciences of the Matter

phyphox : Physical Phone Experiments

Smartphone app. (Android & iOS) to realize and conduct physical experiments

phyphox®
physical phone experiments

https://phyphox.org

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Email: s.bentridi@univ-dbkm.dz

2023/2024

Outline:

- What is phyphox?
- Install phyphox on your phone (smartphone)
- Discover phyphox
- Use phyphox

What is phyphox?

phyphox®
physical phone experiments

- **Remember !!!!**

phyphox.org

Distant_access | Wood_&_Machines | Jobs | HEBBACHE Immobil... | physics_forum | Physics_Code | Histoire_Algerie | Journals_Physics | Elsevier_Practicing | Computer_Coding_... | INcoming_Cor

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physical phone experiments

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Contribute

http://phyphox.org

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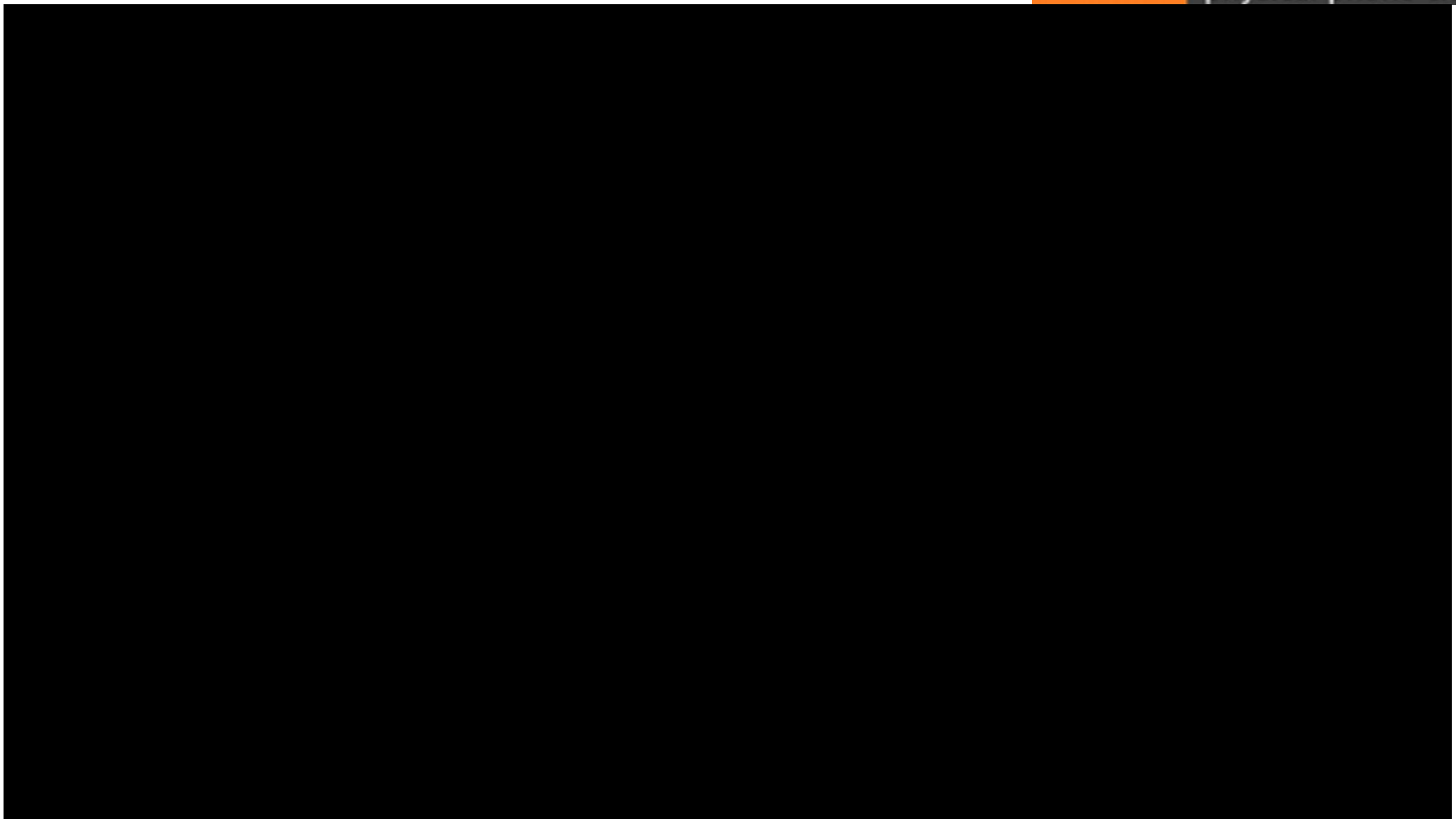
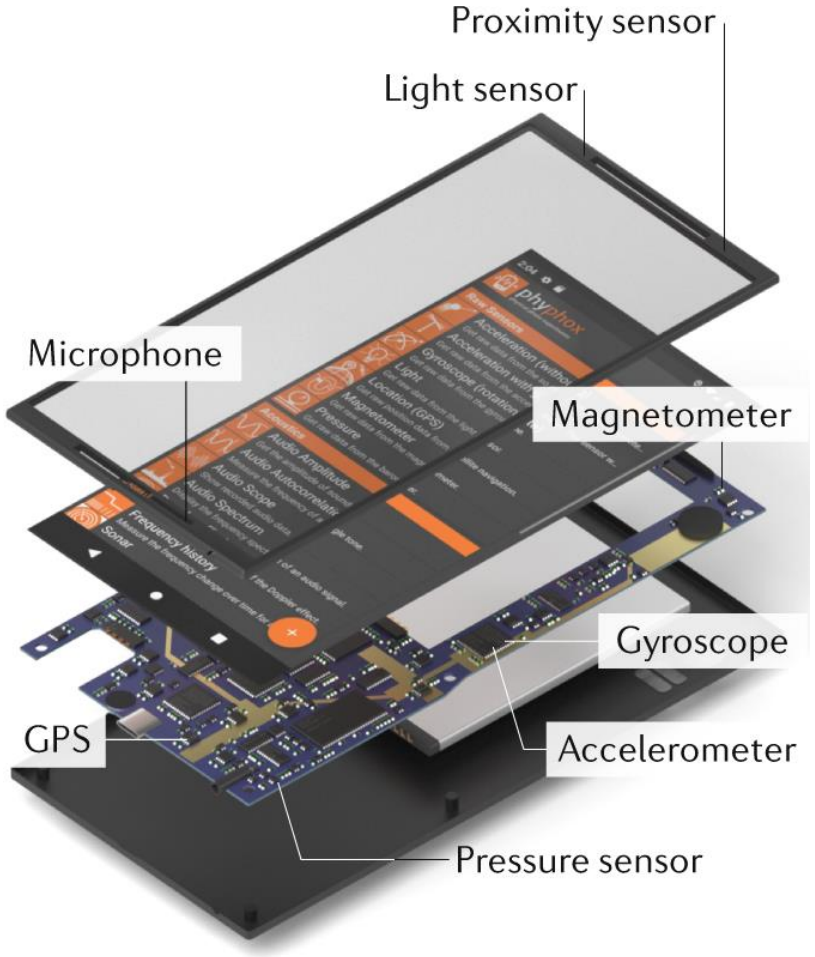
What is phyphox ?



What is phyphox?



phyphox Sensor Database

phyphox
physical phone experiments

Welcome to our sensor database. The information presented here has been collected by our users using the "Submit to sensor database" experiment in phyphox. We can not guarantee that this information is accurate. You can find details on how the data is obtained at the bottom of this page and general statistics across all devices here.

Our database contains a total of **2651** devices, submitted by **19925** users. Last update was on 2021-11-01 03:35:13 (UTC) and took 911 seconds. (Automated updates are usually scheduled once a day.)

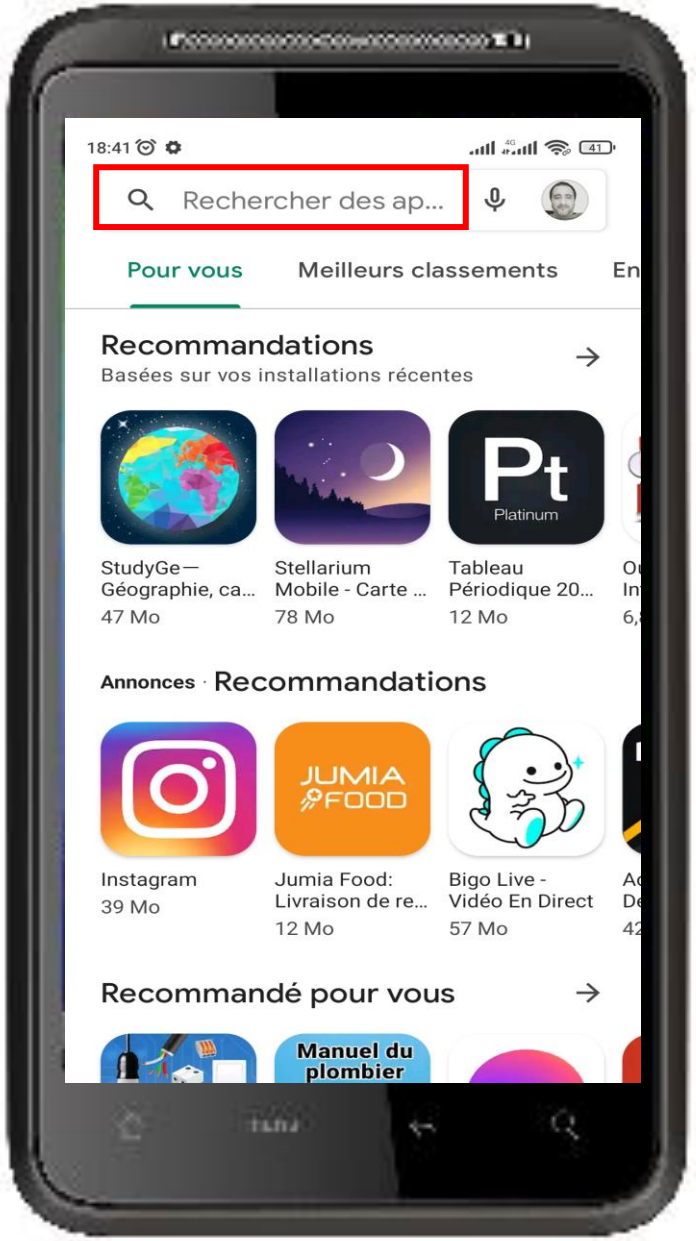
Manufacturer	Model	Sample size	Variants	Accelerometer				Acceleration (without g)			Gyroscope		Magnetometer		Pressure		Temperature		Humidity		Li...	Pr
samsung	filter column...			Available	Rate	Average	Std Dev	Available	Rate	Std Dev	Available	Rate	Available	Rate	Available	Rate	Available	Rate	Available	Rate	Available	
samsung	SM-N950F	80	3	✓	499.7 Hz	9.903 m/s²	0.014 m/s²	✓	104.9 Hz	0.020 m/s²	✓	499.7 Hz	✓	99.9 Hz	✓	10.0 Hz	✗		✗		✓	✓
samsung	SM-A520F	150	5	✓	195.4 Hz	9.730 m/s²	0.019 m/s²	✓	104.2 Hz	0.021 m/s²	✓	195.4 Hz	✓	97.6 Hz	✓	5.6 Hz	✗		✗		✓	✓
samsung	SM-A730F	4	1	✓	202.3 Hz	9.654 m/s²	0.016 m/s²	✓	100.9 Hz	0.016 m/s²	✓	202.3 Hz	✓	101.1 Hz	✓	6.3 Hz	✗		✗		✓	✓
samsung	SM-G9730	2	1	✓	399.8 Hz	9.740 m/s²	0.012 m/s²	✓	199.9 Hz	0.013 m/s²	✓	399.8 Hz	✓	100.0 Hz	✓	25.0 Hz	✗		✗		✓	✓
samsung	SM-G975F	125	2	✓	497.7 Hz	9.819 m/s²	0.011 m/s²	✓	100.9 Hz	0.021 m/s²	✓	497.7 Hz	✓	100.1 Hz	✓	10.2 Hz	✗		✗		✓	✓
samsung	SM-G960F	189	3	✓	500.1 Hz	9.782 m/s²	0.014 m/s²	✓	110.6 Hz	0.028 m/s²	✓	500.1 Hz	✓	100.0 Hz	✓	9.9 Hz	✗		✗		✓	✓
samsung	SM-J700F	7	1	✓	100.0 Hz	9.611 m/s²	0.016 m/s²	✗			✗		✗		✗		✗		✗		✗	✓
samsung	SM-G955W	1	1	✓	409.6 Hz	9.858 m/s²	0.010 m/s²	✓	204.8 Hz	0.0052 …	✓	409.6 Hz	✓	38.0 Hz	✓	30.0 Hz	✗		✗		✓	✓
samsung	SM-G900F	52	2	✓	202.7 Hz	9.805 m/s²	0.026 m/s²	✓	151.9 Hz	0.039 m/s²	✓	202.7 Hz	✓	101.2 Hz	✓	5.6 Hz	✗		✗		✓	✓
samsung	SM-G930F	233	4	✓	498.4 Hz	9.670 m/s²	0.014 m/s²	✓	99.9 Hz	0.030 m/s²	✓	498.3 Hz	✓	99.9 Hz	✓	10.1 Hz	✗		✗		✓	✓
samsung	SM-A505G	5	2	✓	507.0 Hz	9.674 m/s²	0.025 m/s²	✓	127.3 Hz	0.042 m/s²	✓	507.0 Hz	✓	126.7 Hz	✗		✗		✗		✓	✓
samsung	SM-J730G	2	1	✓	100.0 Hz	9.934 m/s²	0.010 m/s²	✓	100.0 Hz	0.010 m/s²	✓	100.0 Hz	✓	100.0 Hz	✗		✗		✗		✓	✓
samsung	SM-N976B	17	1	✓	500.0 Hz	9.780 m/s²	0.011 m/s²	✓	100.2 Hz	0.017 m/s²	✓	500.0 Hz	✓	100.2 Hz	✓	10.3 Hz	✗		✗		✓	✓
samsung	SM-G973F	240	1	✓	500.1 Hz	9.819 m/s²	0.011 m/s²	✓	100.2 Hz	0.022 m/s²	✓	500.1 Hz	✓	100.0 Hz	✓	10.2 Hz	✗		✗		✓	✓
samsung	SM-N970F	27	1	✓	500.0 Hz	9.782 m/s²	0.037 m/s²	✓	98.7 Hz	0.046 m/s²	✓	500.0 Hz	✓	98.7 Hz	✓	9.4 Hz	✗		✗		✓	✓

Install phyphox on your phone

phyphox

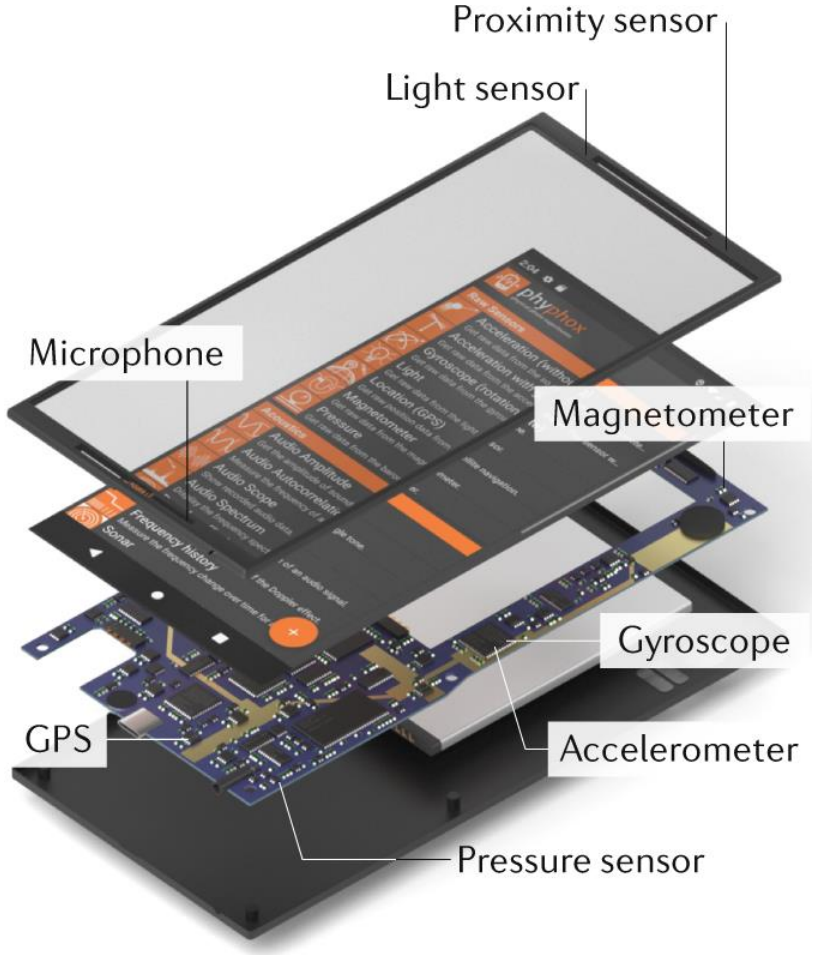
Available on the App Store

ANDROID APP ON Google play

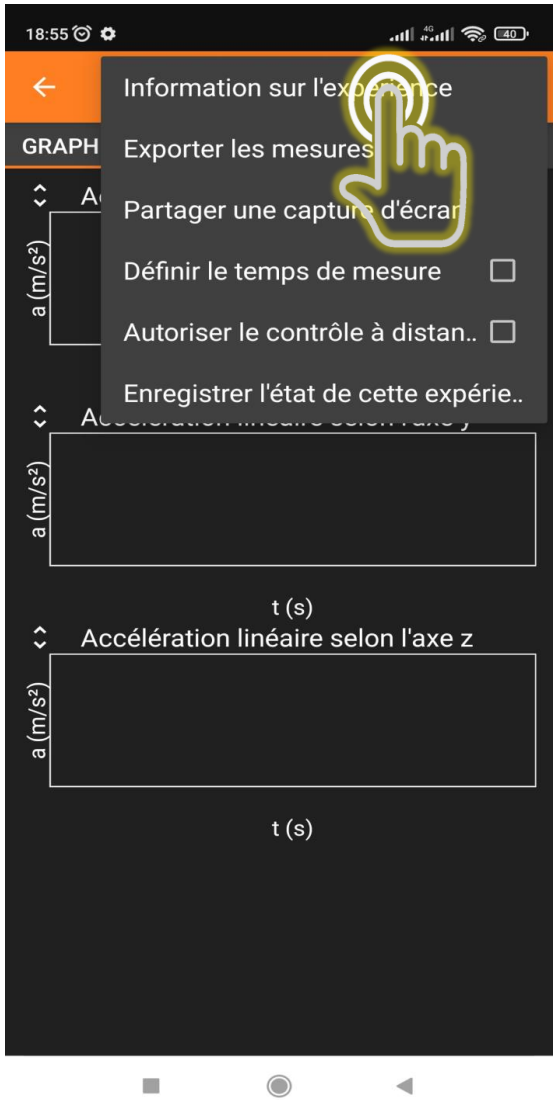


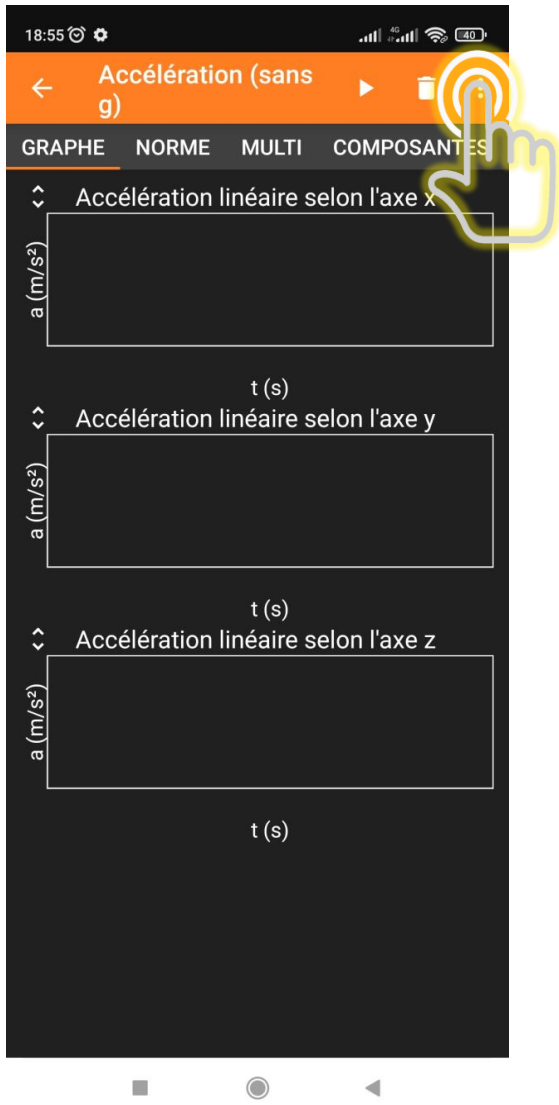
Discover phyphox

phyphox®
physical phone experiments



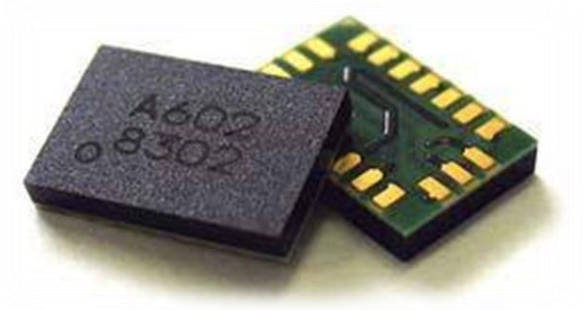

18:56
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
a (m/s²)
Accélération (sans g)
Mesures de l'accélération du téléphone uniquement, sans l'accélération gravitationnelle. À la différence du capteur « accélération avec g », ce capteur indique une accélération nulle lorsque le téléphone est au repos.
WIKI
X / Y / Z
OK
t (s)

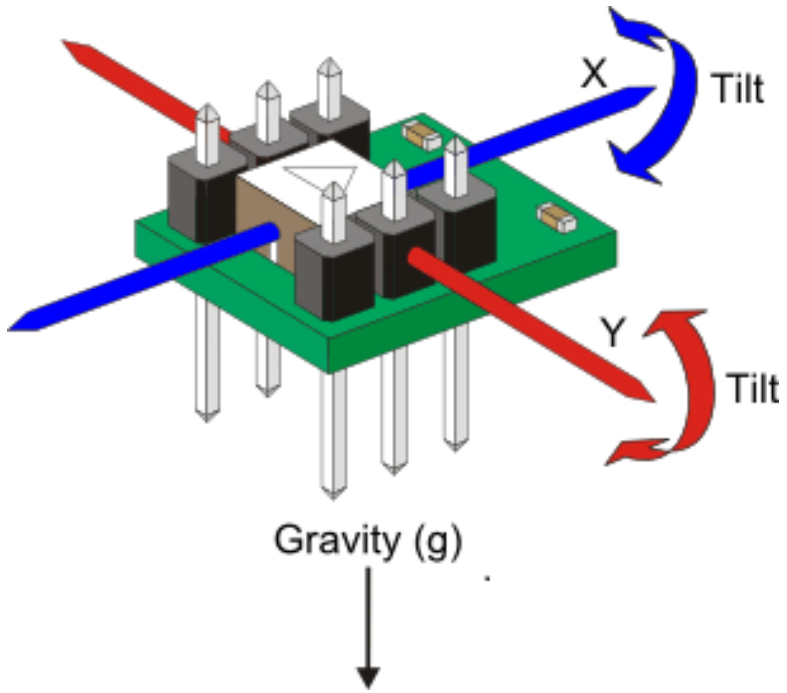

18:55
Information sur l'expérience
Exporter les mesures
Partager une capture d'écran
Définir le temps de mesure
Autoriser le contrôle à distan..
Enregistrer l'état de cette expérie..
a (m/s²)
t (s)
Accélération linéaire selon l'axe z
t (s)

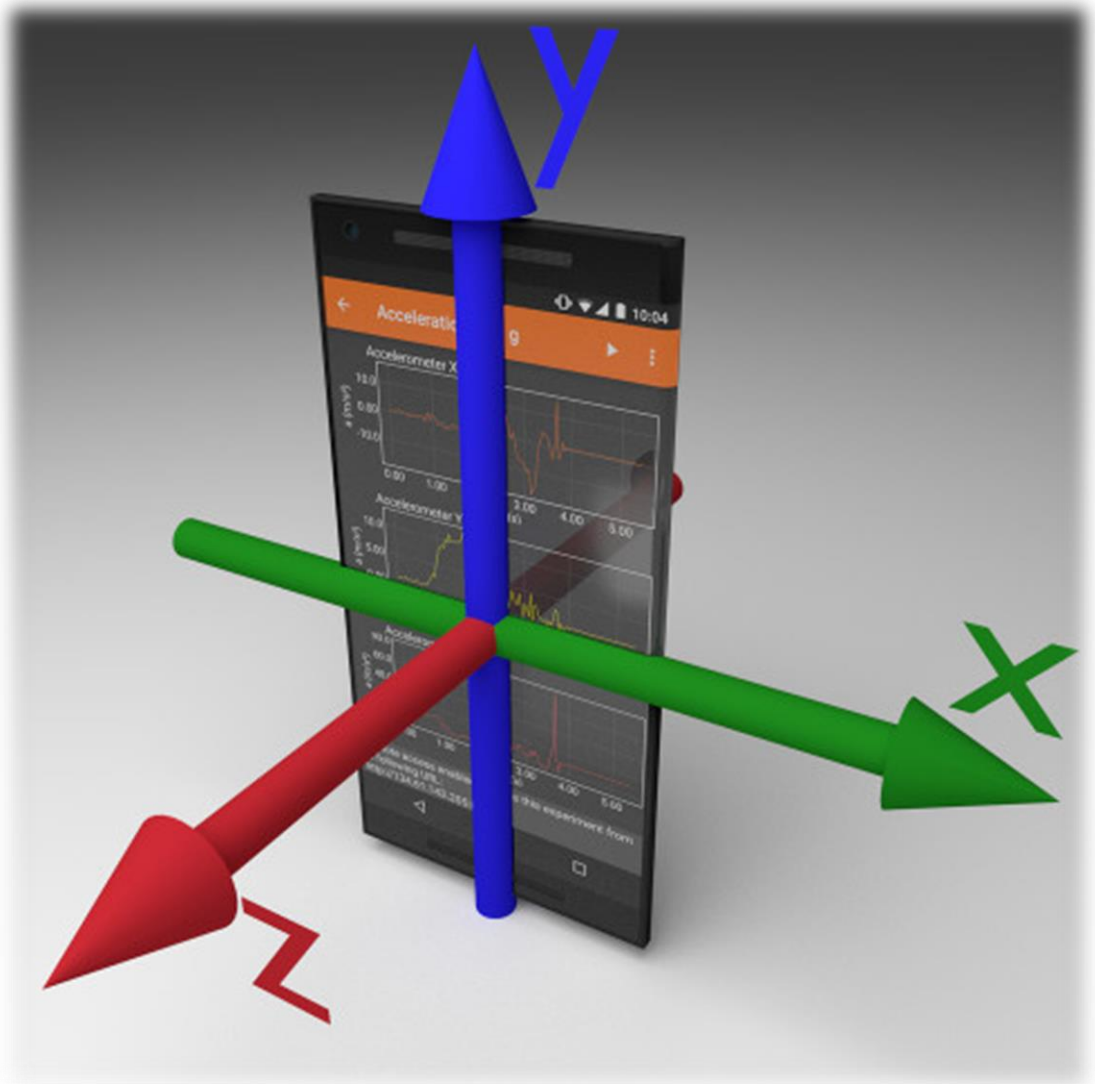

18:55
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
a (m/s²)
t (s)
Accélération linéaire selon l'axe y
t (s)
Accélération linéaire selon l'axe z
t (s)

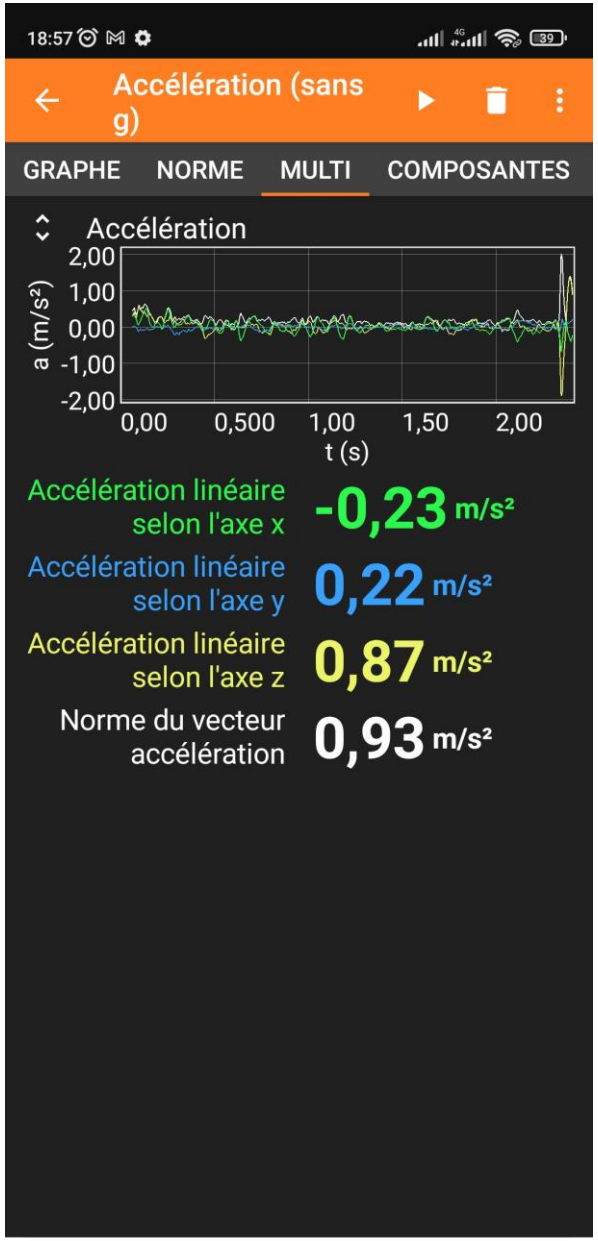

2:03
phyphox
Raw Sensors
Acceleration (without g)
Acceleration with g
Gyroscope
Get raw data from the gyroscope.
Light
Get raw data from the light sensor.
Magnetometer
Get raw data from the magnetometer.
Pressure
Get raw data from the barometer.
Acoustics
Audio Amplitude
Get the amplitude of sounds.
Audio Autocorrelation
Measure the frequency of a single tone.
Audio Scope
Show recorded audio data.
Audio Spectrum
Display the frequency spectrum of an audio signal.
Doppler effect
Detect small frequency shifts of the Doppler effect.
Frequency history
Sonar

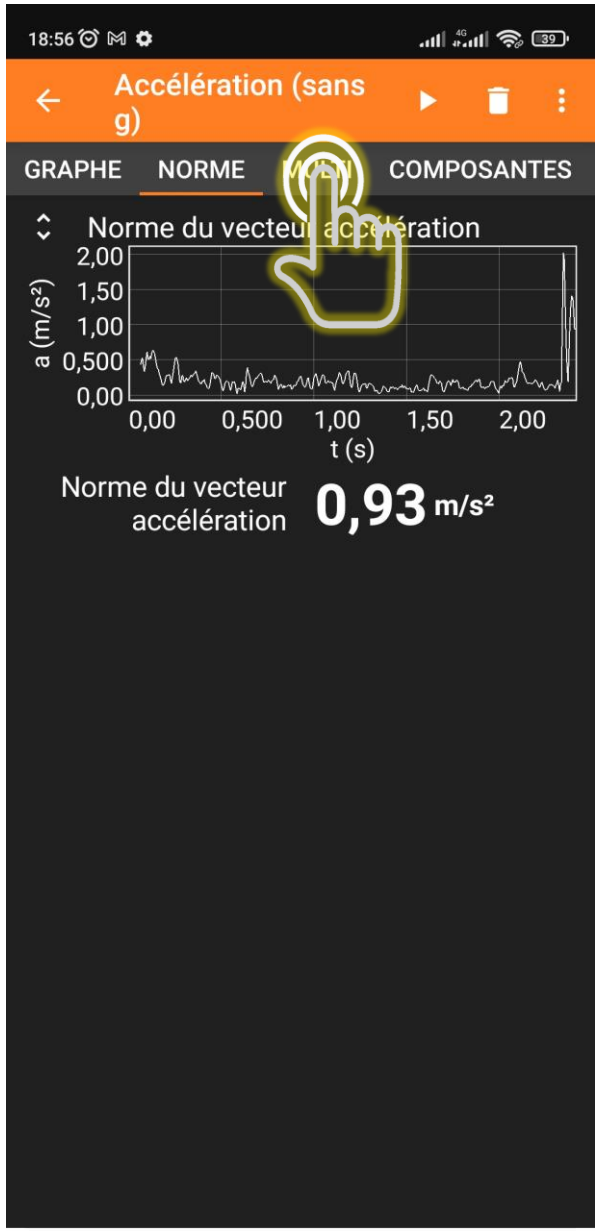
Smartphone axes

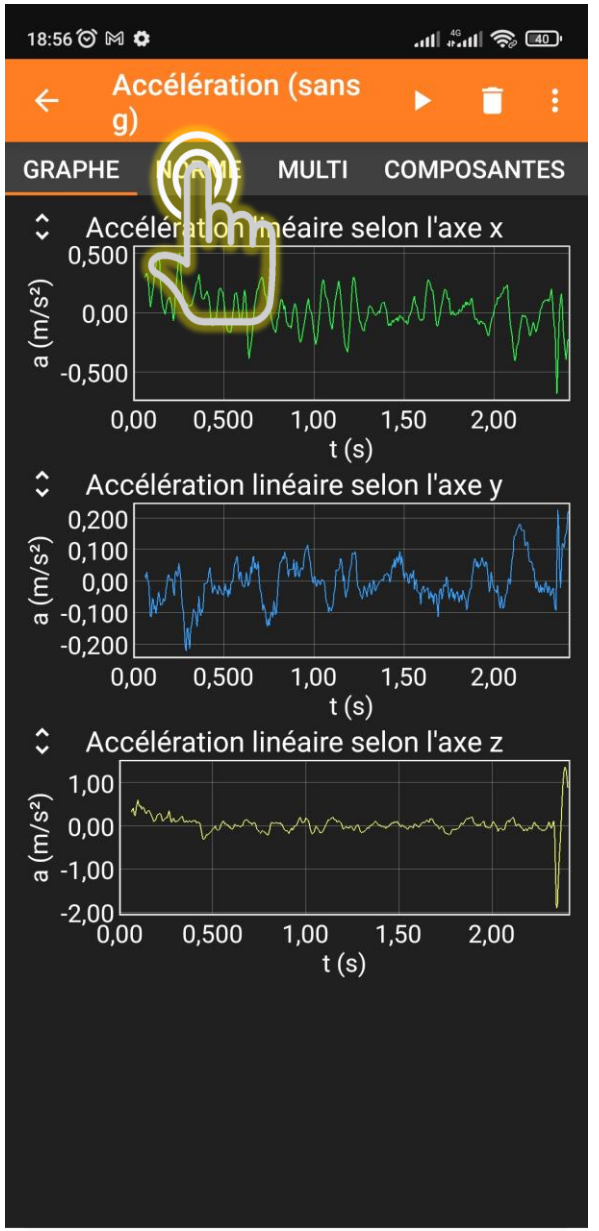


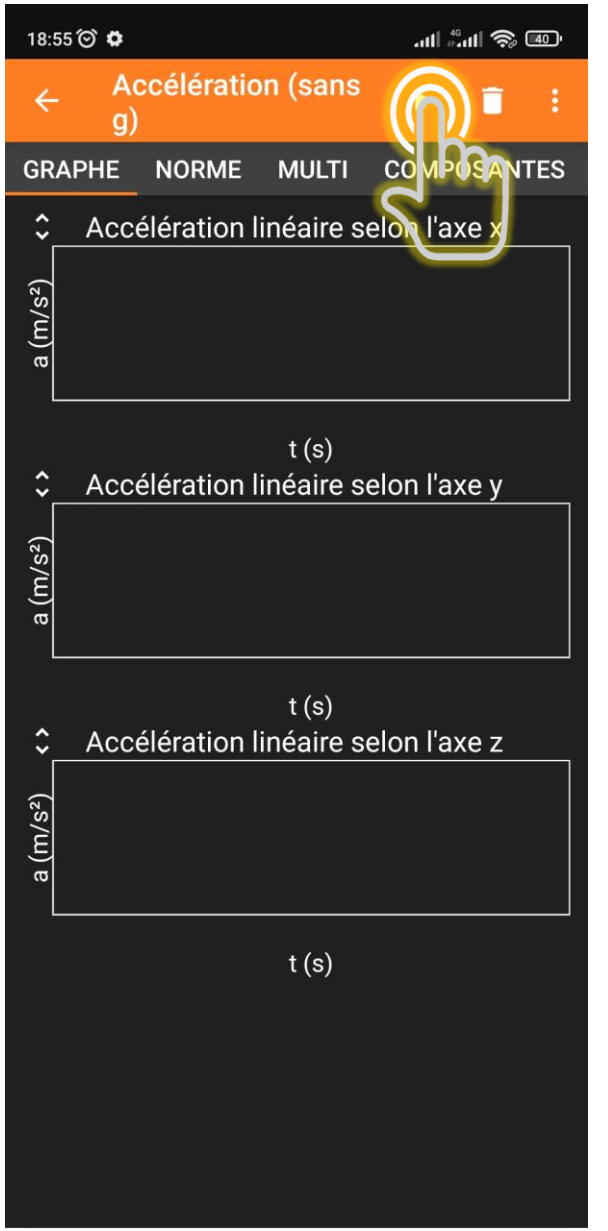


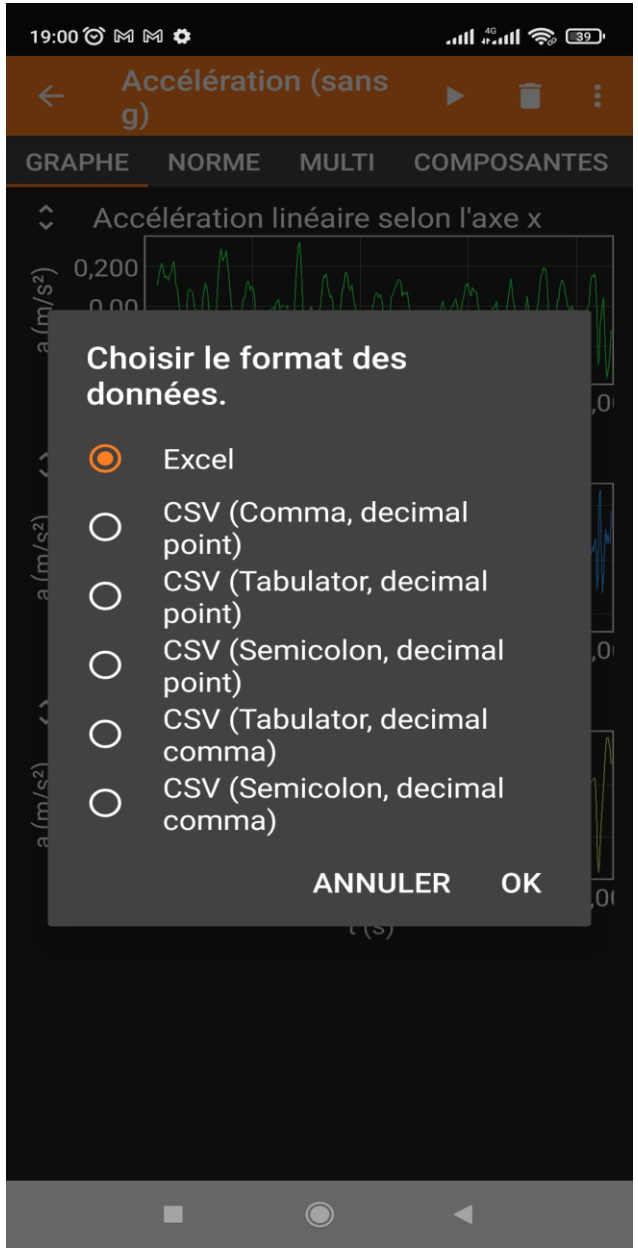


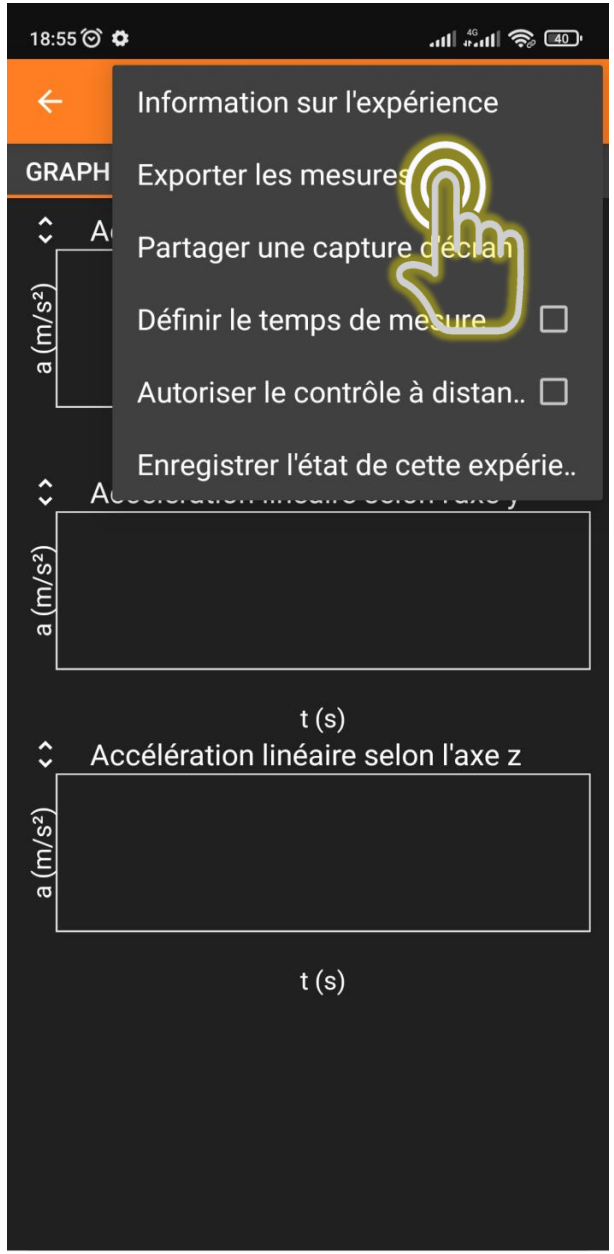

18:57
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération
a (m/s²)
2,00
1,00
0,00
-1,00
-2,00
0,00
0,500
1,00
1,50
2,00
t (s)
Accélération linéaire selon l'axe x
-0,23 m/s²
Accélération linéaire selon l'axe y
0,22 m/s²
Accélération linéaire selon l'axe z
0,87 m/s²
Norme du vecteur accélération
0,93 m/s²


18:56
Accélération (sans g)
GRAPHE
NORME
COMPOSANTES
Norme du vecteur accélération
a (m/s²)
2,00
1,50
1,00
0,500
0,00
0,00
0,500
1,00
1,50
2,00
t (s)
Norme du vecteur accélération
0,93 m/s²

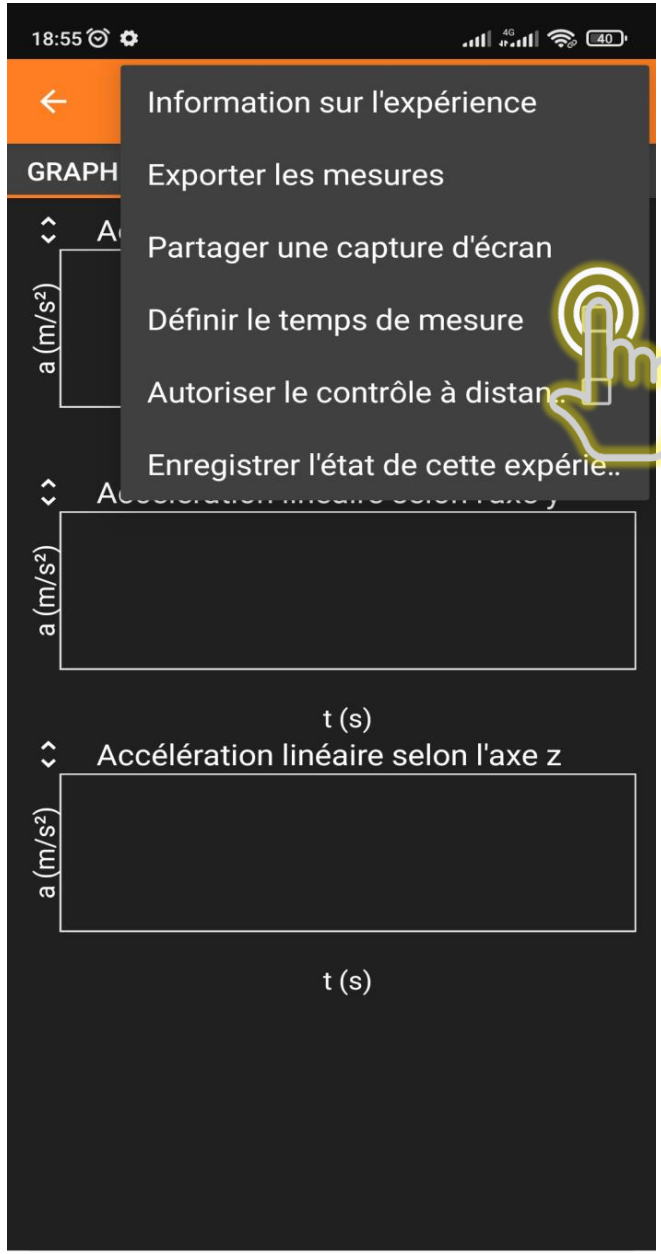

18:56
Accélération (sans g)
GRAPHE
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
a (m/s²)
0,500
0,00
-0,500
0,00
0,500
1,00
1,50
2,00
t (s)
Accélération linéaire selon l'axe y
a (m/s²)
0,200
0,100
0,00
-0,100
-0,200
0,00
0,500
1,00
1,50
2,00
t (s)
Accélération linéaire selon l'axe z
a (m/s²)
1,00
0,00
-1,00
-2,00
0,00
0,500
1,00
1,50
2,00
t (s)

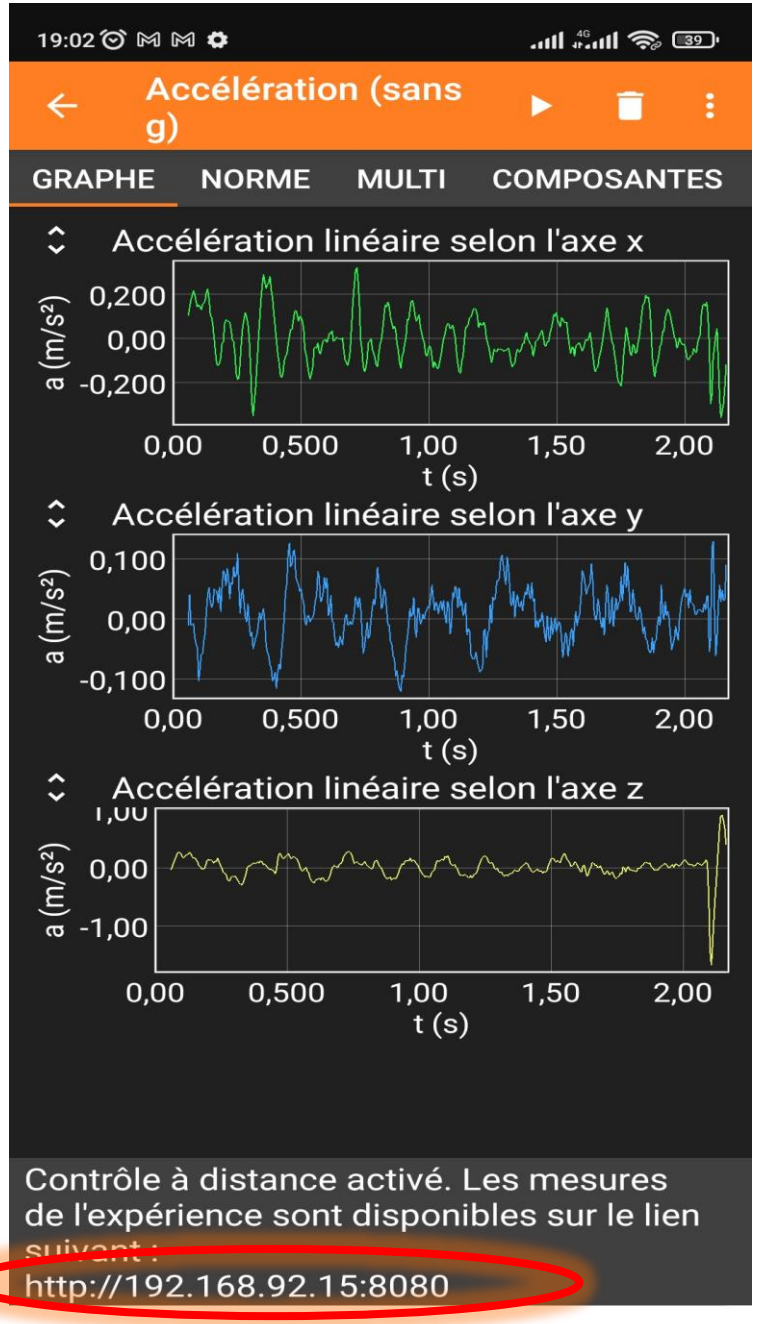

18:55
Accélération (sans g)
GRAPHE
NORME
MULTI
Accélération linéaire selon l'axe x
a (m/s²)
t (s)
Accélération linéaire selon l'axe y
a (m/s²)
t (s)
Accélération linéaire selon l'axe z
a (m/s²)
t (s)

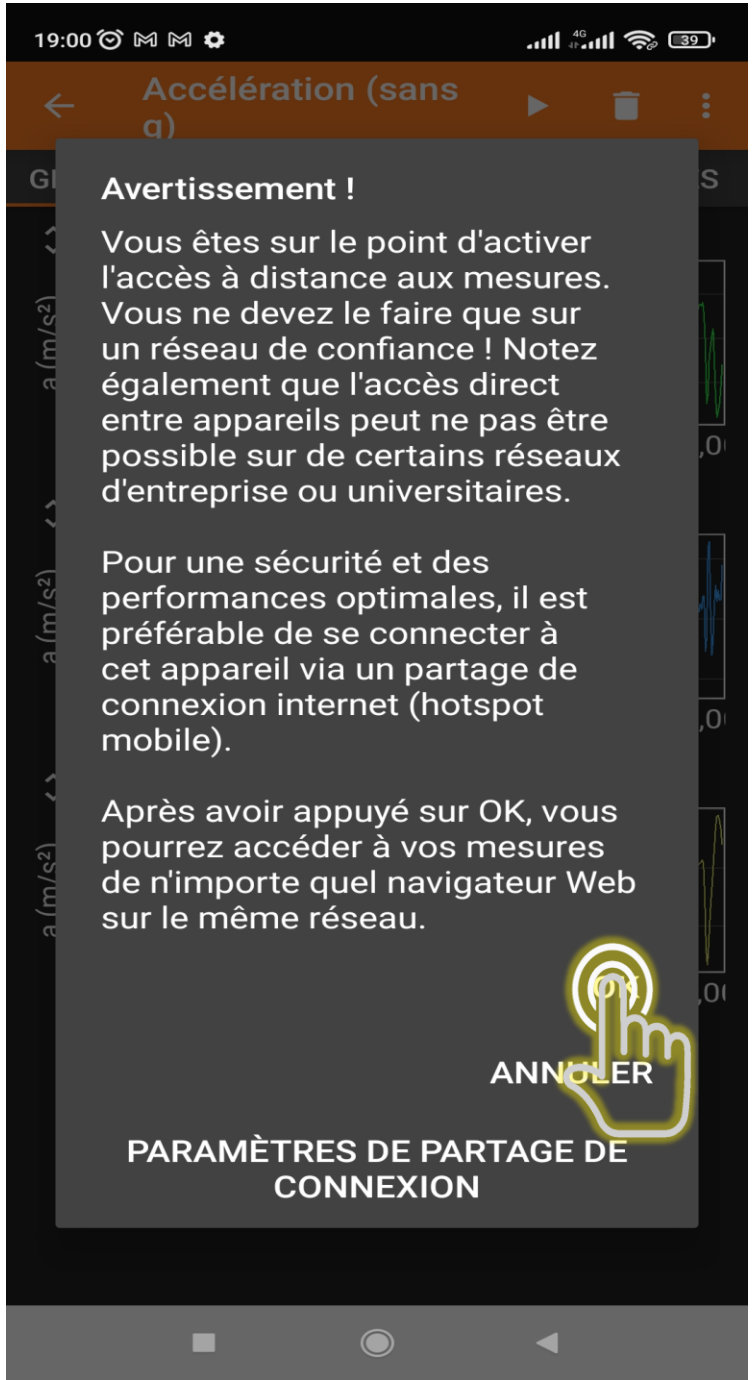

19:00
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
0,200
a (m/s²)
Choisir le format des données.
Excel
CSV (Comma, decimal point)
CSV (Tabulator, decimal point)
CSV (Semicolon, decimal point)
CSV (Tabulator, decimal comma)
CSV (Semicolon, decimal comma)
ANNULER
OK

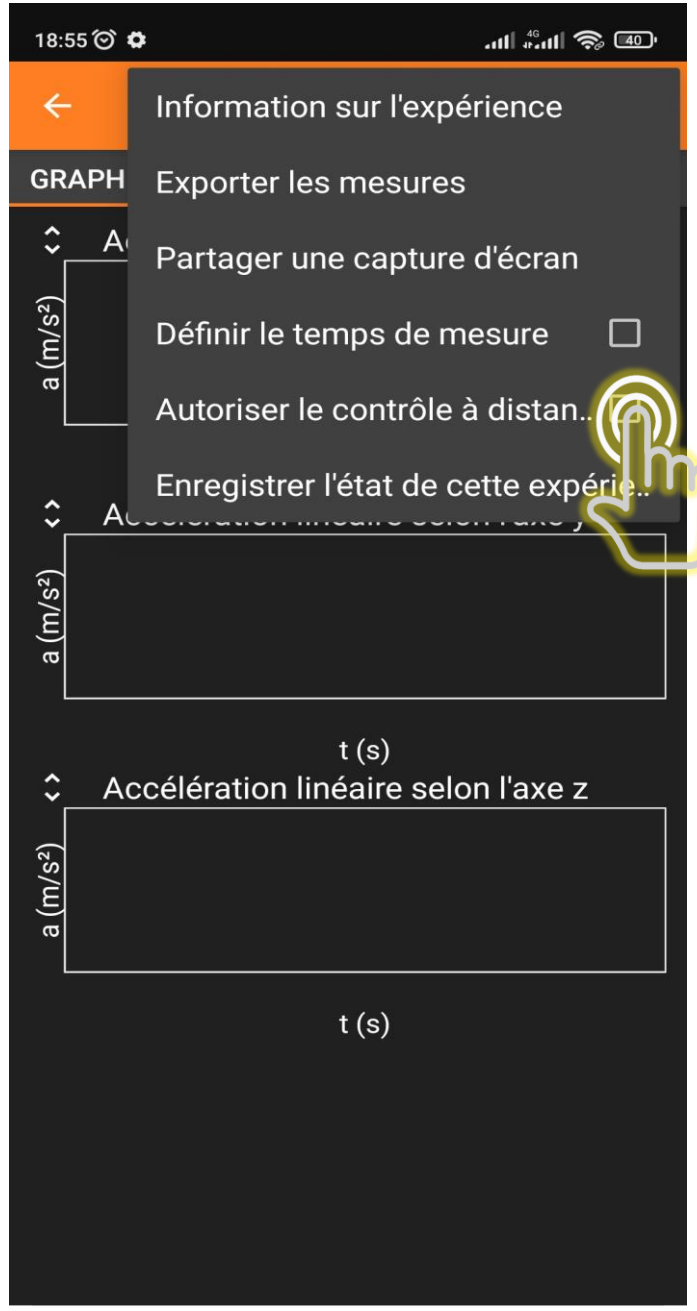

18:55
Information sur l'expérience
Exporter les mesures
Partager une capture d'écran
Définir le temps de mesure
Autoriser le contrôle à distan..
Enregistrer l'état de cette expérie..
a (m/s²)
t (s)
Accélération linéaire selon l'axe z
t (s)

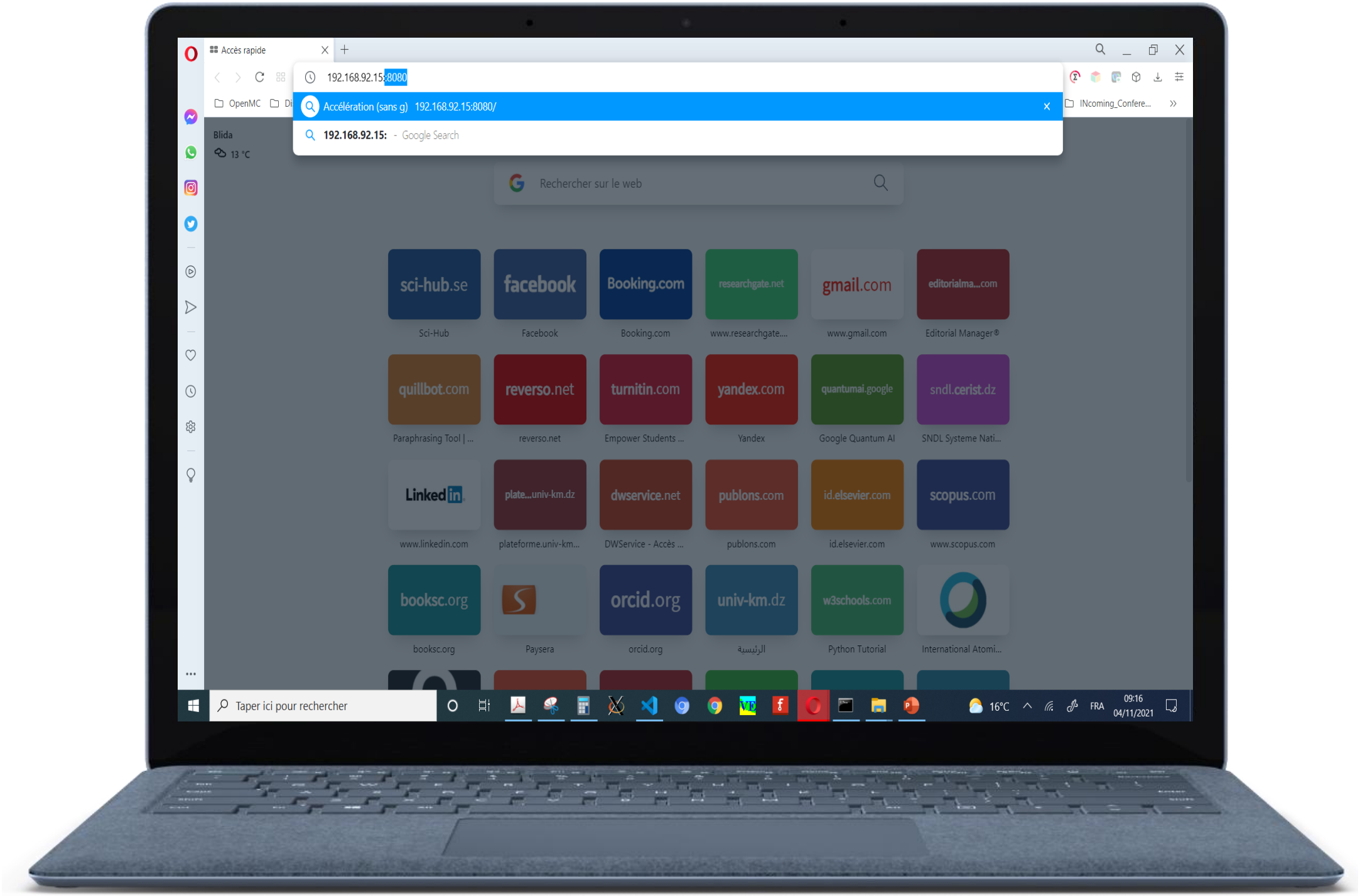

18:59
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
Expérience chronométrée
Faire des mesures pendant un temps donné
Délai avant de commencer (s) 3.0
Durée de l'expérience (s) 10.0
Acoustic signals
ACTIVATE ALL
Countdown sounds
Start sound
Running sounds
Stop sound
ANNULER
OK


18:55
Information sur l'expérience
Exporter les mesures
Partager une capture d'écran
Définir le temps de mesure
Autoriser le contrôle à distan..
Enregistrer l'état de cette expérie..
a (m/s²)
t (s)
Accélération linéaire selon l'axe z
t (s)


19:02
Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
a (m/s²)
0,200
0,00
-0,200
0,00
0,500
1,00
1,50
2,00
t (s)
Accélération linéaire selon l'axe y
a (m/s²)
0,100
0,00
-0,100
0,00
0,500
1,00
1,50
2,00
t (s)
Accélération linéaire selon l'axe z
a (m/s²)
0,00
-1,00
0,00
0,500
1,00
1,50
2,00
t (s)
Contrôle à distance activé. Les mesures de l'expérience sont disponibles sur le lien suivant :
http://192.168.92.15:8080


19:00
Accélération (sans g)
Avertissement !
Vous êtes sur le point d'activer l'accès à distance aux mesures. Vous ne devez le faire que sur un réseau de confiance ! Notez également que l'accès direct entre appareils peut ne pas être possible sur de certains réseaux d'entreprise ou universitaires.
Pour une sécurité et des performances optimales, il est préférable de se connecter à cet appareil via un partage de connexion internet (hotspot mobile).
Après avoir appuyé sur OK, vous pourrez accéder à vos mesures de n'importe quel navigateur Web sur le même réseau.
OK
ANNULER
PARAMÈTRES DE PARTAGE DE CONNEXION


18:55
Information sur l'expérience
Exporter les mesures
Partager une capture d'écran
Définir le temps de mesure
Autoriser le contrôle à distan..
Enregistrer l'état de cette expérie..
a (m/s²)
t (s)
Accélération linéaire selon l'axe z
a (m/s²)
t (s)


Accès rapide
192.168.92.15:8080
Accélération (sans g) 192.168.92.15:8080/
192.168.92.15: - Google Search
Blida
13 °C
Rechercher sur le web
sci-hub.se
Sci-Hub
facebook
Facebook
Booking.com
Booking.com
researchgate.net
www.researchgate....
gmail.com
www.gmail.com
editorialma...com
Editorial Manager®
quillbot.com
Paraphrasing Tool | ...
reverso.net
reverso.net
turnitin.com
Empower Students ...
yandex.com
Yandex
quantumai.google
Google Quantum AI
sndl.cerist.dz
SNDL Systeme Nati...
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plateforme.univ-km...
dwservice.net
DWService - Accès ...
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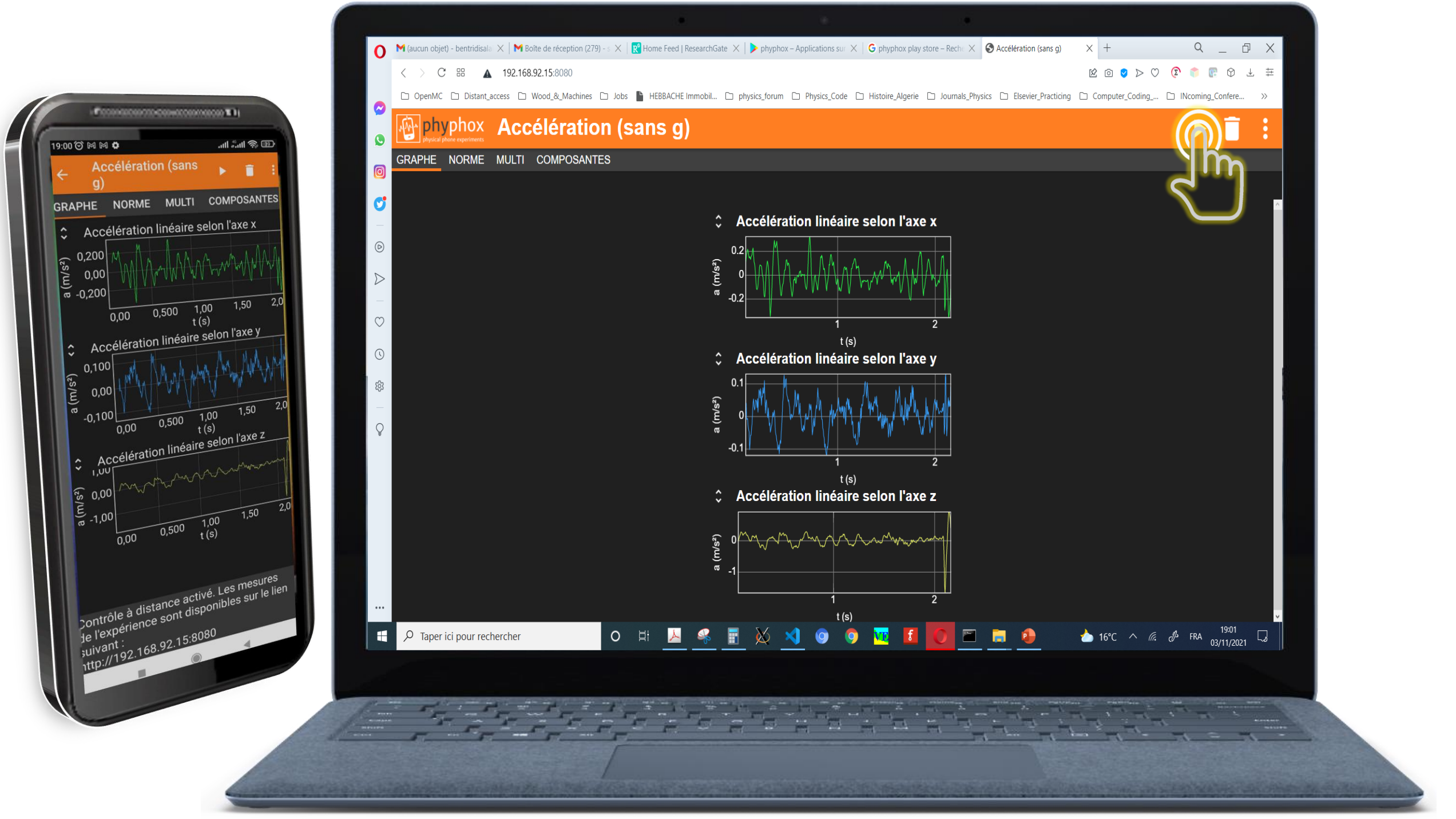
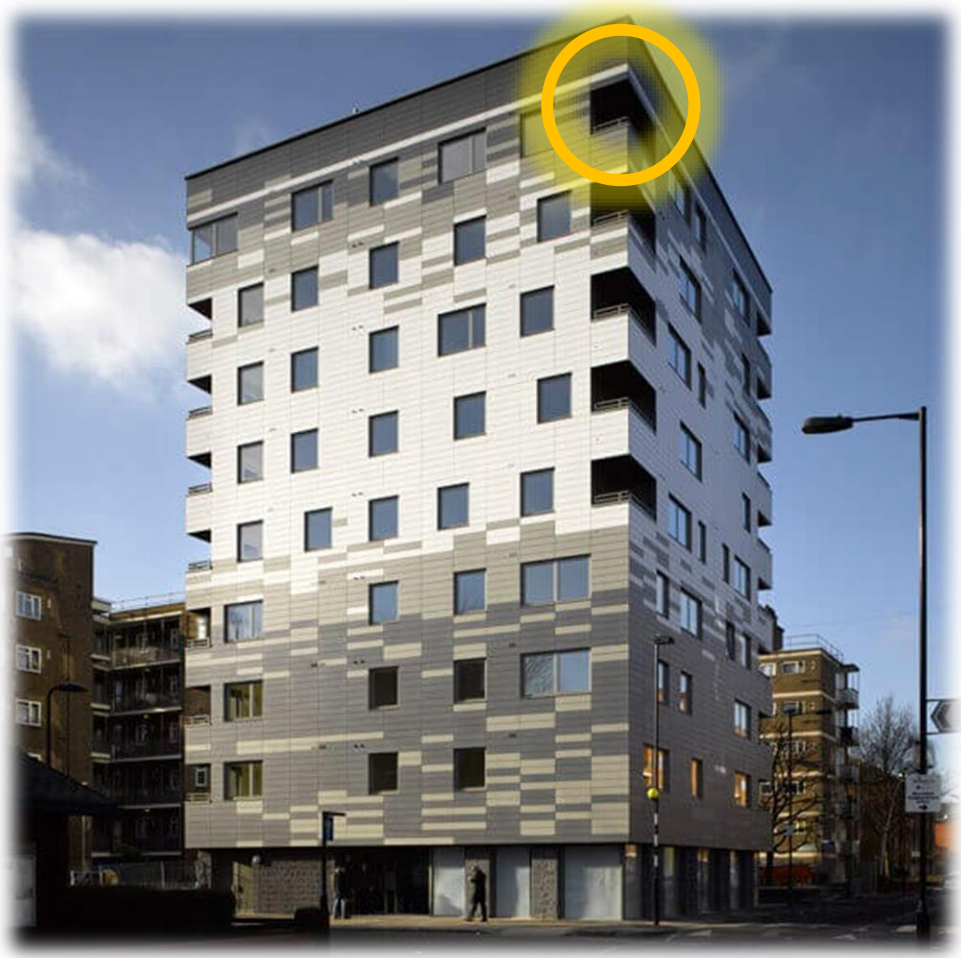
booksc.org
Paysera
orcid.org
orcid.org
univ-km.dz
الرئيسية
w3schools.com
Python Tutorial
International Atomi...
Taper ici pour rechercher
16°C
FRA
09:16
04/11/2021


Accélération (sans g)
GRAPHE
NORME
MULTI
COMPOSANTES
Accélération linéaire selon l'axe x
Accélération linéaire selon l'axe y
Accélération linéaire selon l'axe z
a (m/s²)
t (s)
Contrôle à distance activé. Les mesures de l'expérience sont disponibles sur le lien suivant :
http://192.168.92.15:8080
192.168.92.15:8080
phyphox
Taper ici pour rechercher

Use phyphox

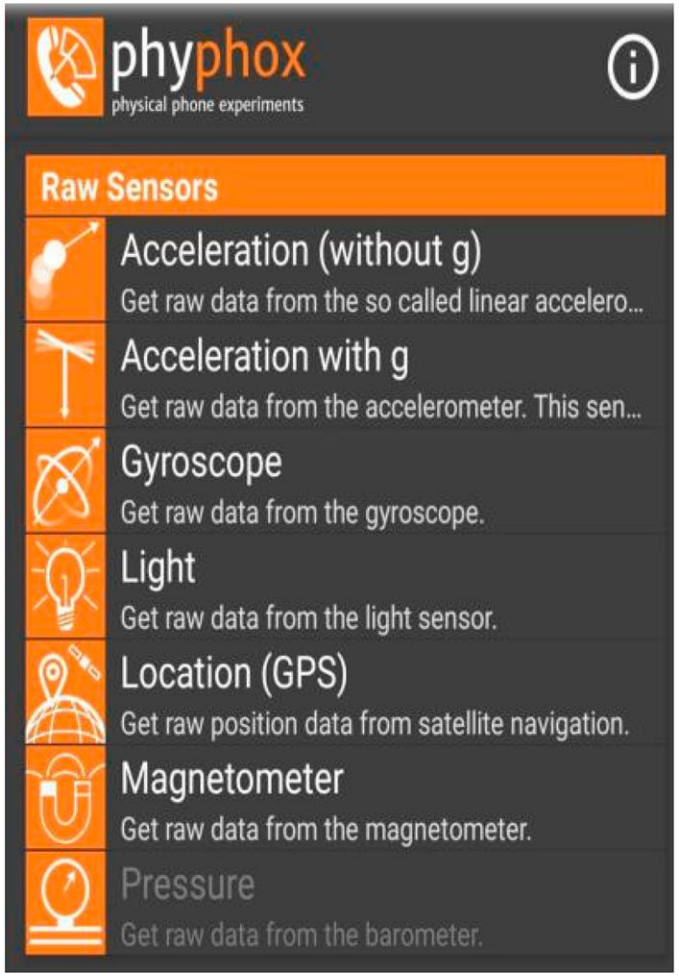

Federpendel
Beschleunigung mit g
GRAPH
BETRAG
MULTI
EINFACH
Beschleunigung x
Beschleunigung y
Beschleunigung z
t (s)

Measure the acceleration: Free fall

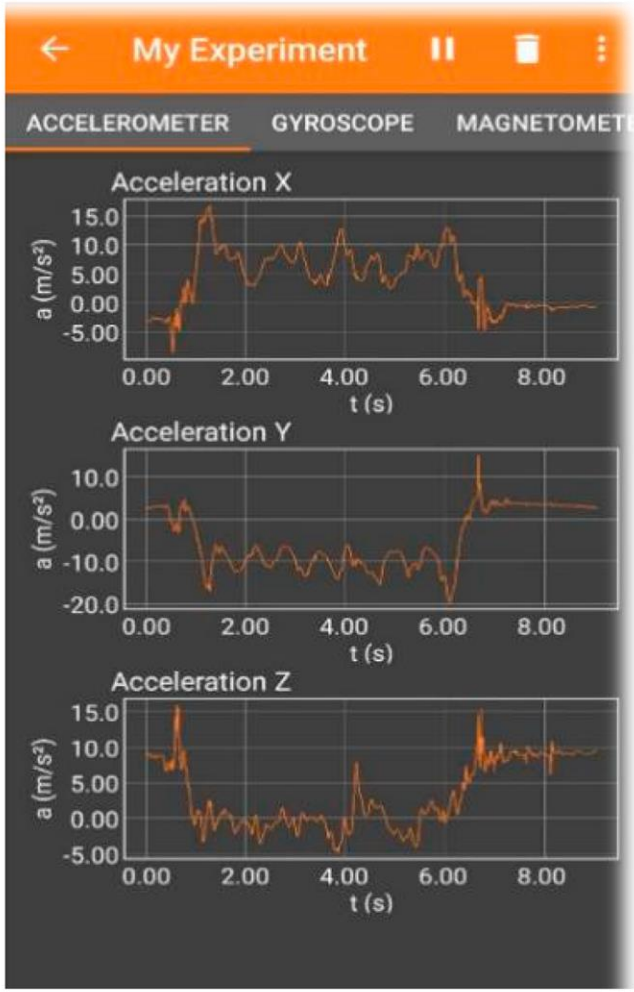


Measure acceleration: Daily walking

(a)

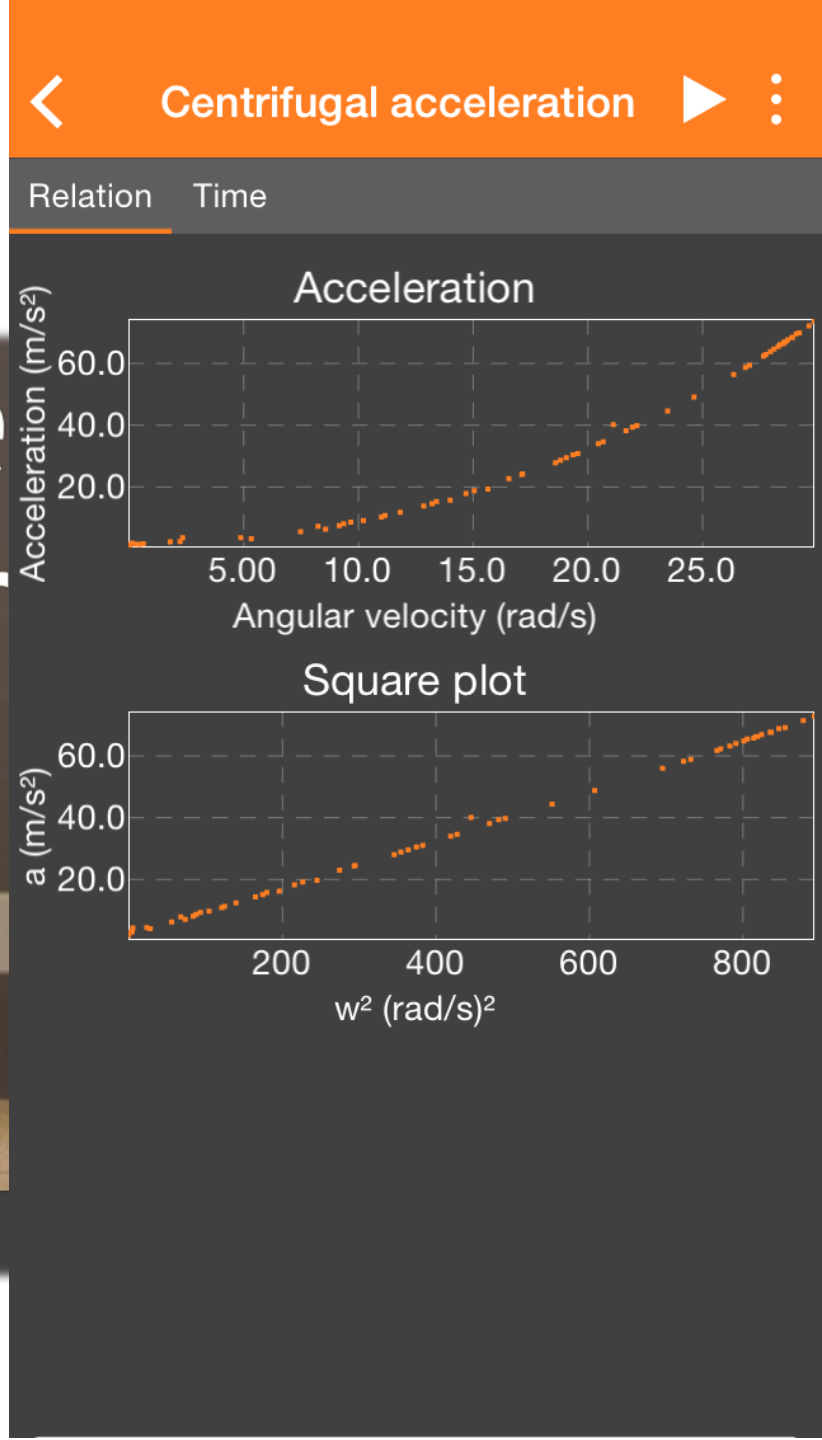


(b)

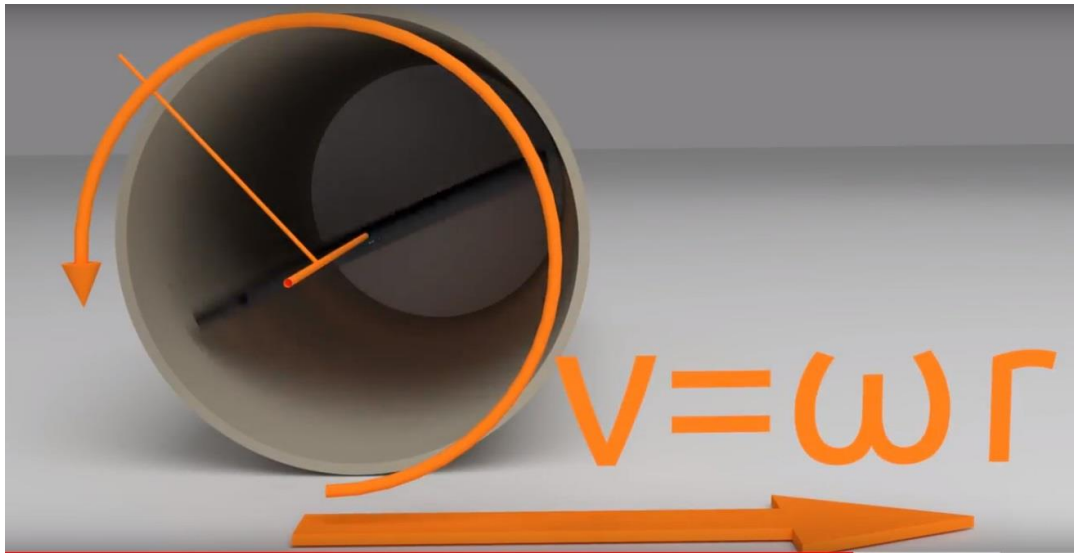


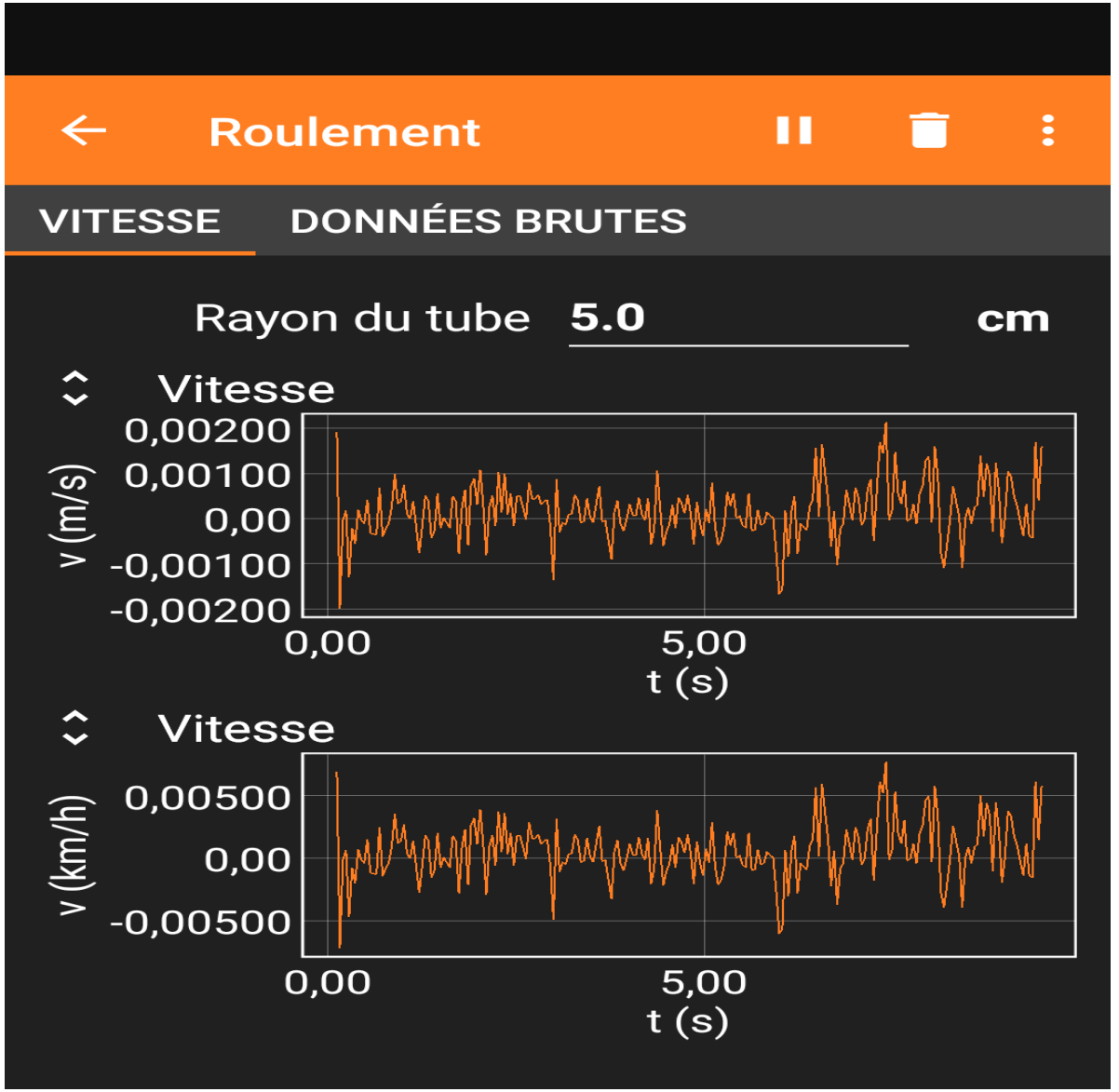
(c)

Measure angular speed:

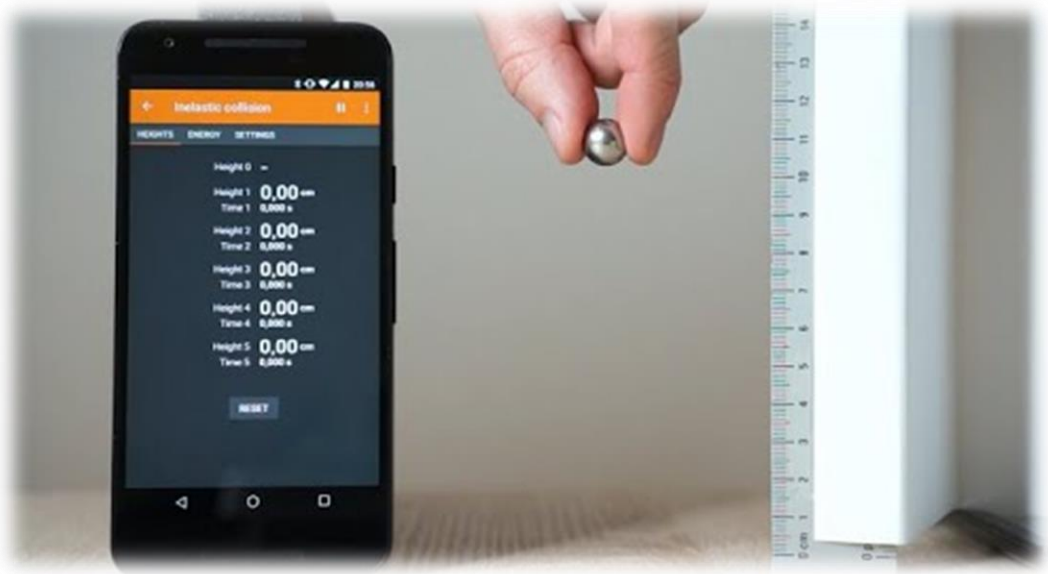


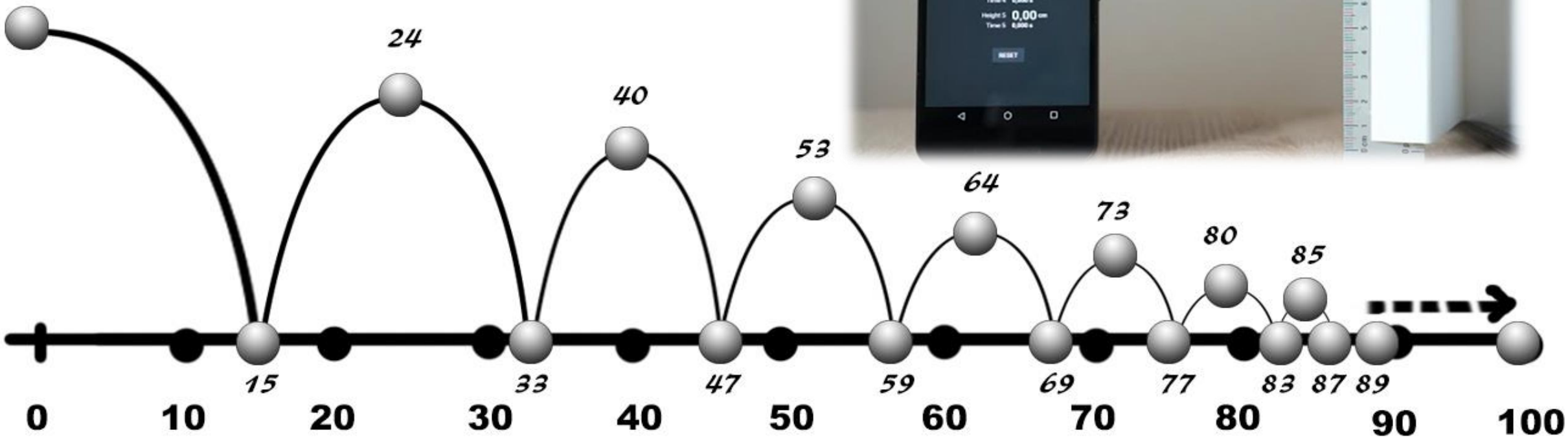
Relation between angular and linear speed:





Bouncing ball experiment: (in)elastic collision

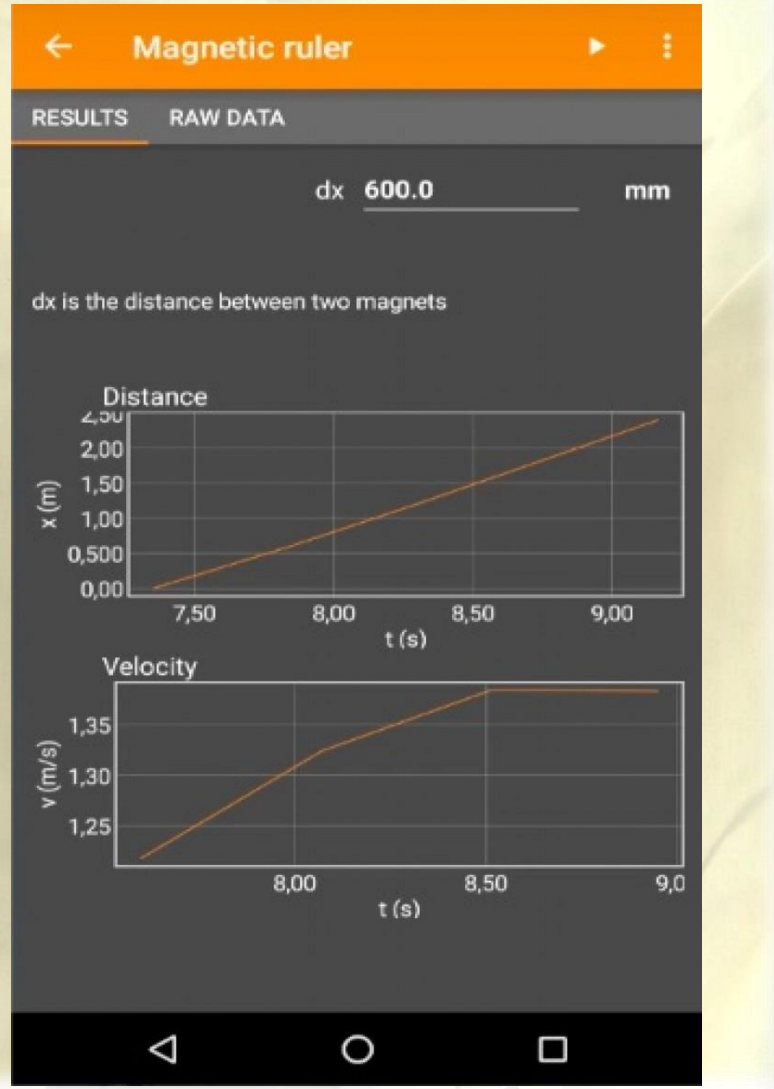


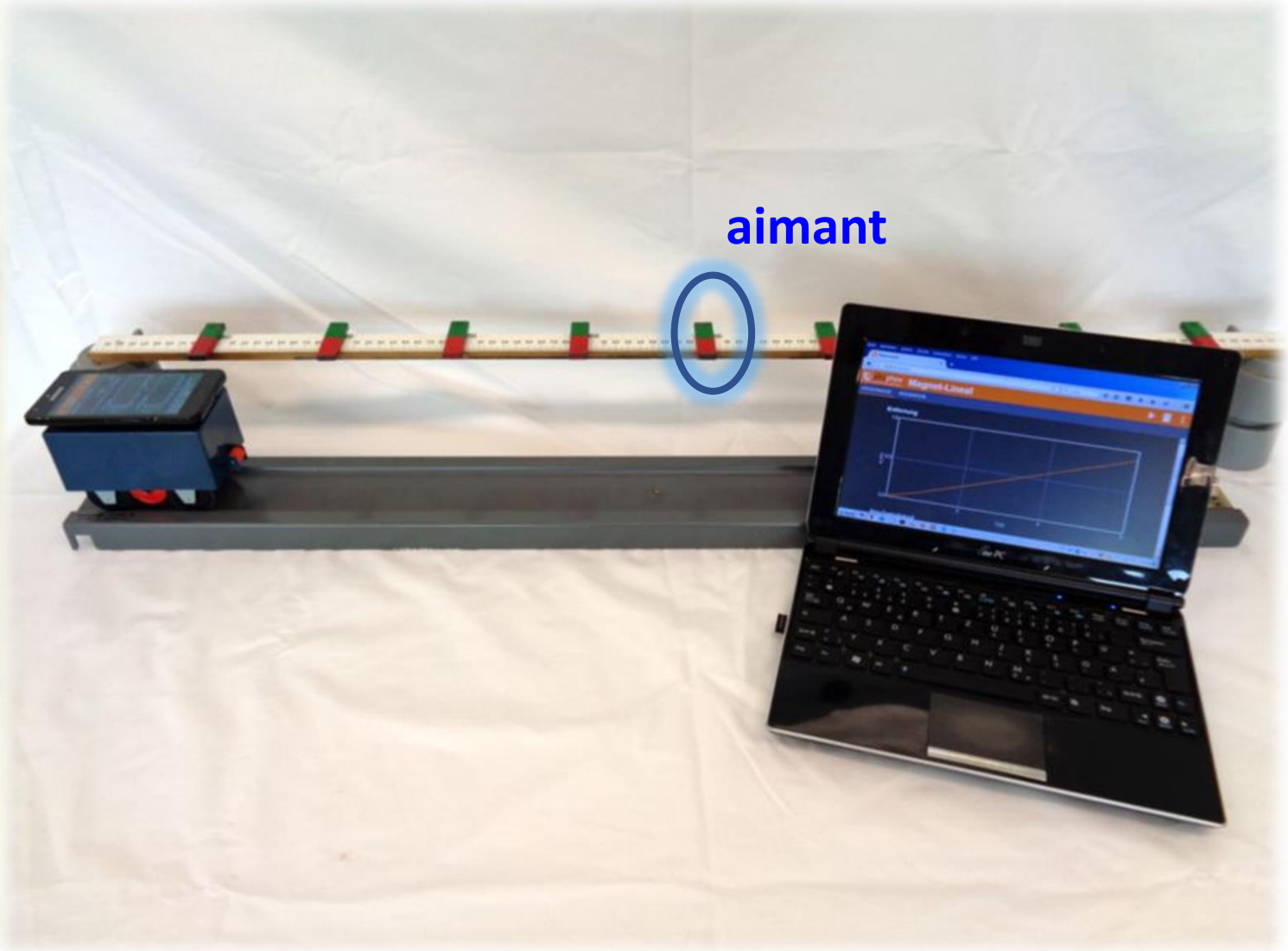


Measure the sound velocity: (require two smartphone)

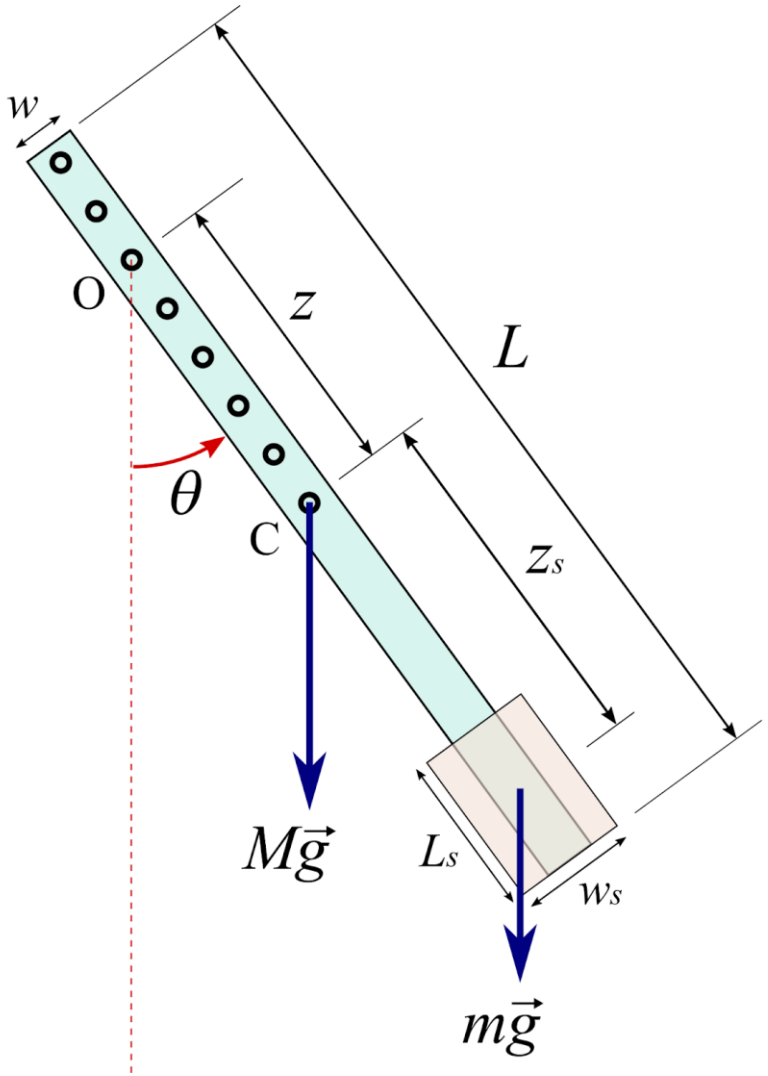
$$v_{\text{sound}} = \frac{2\Delta x}{\Delta t_B - \Delta t_A}$$

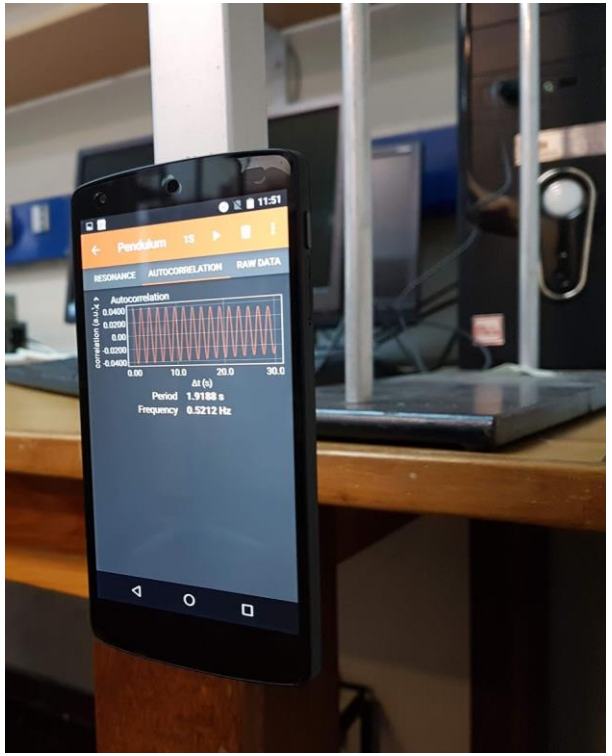
Study of a straight motion:

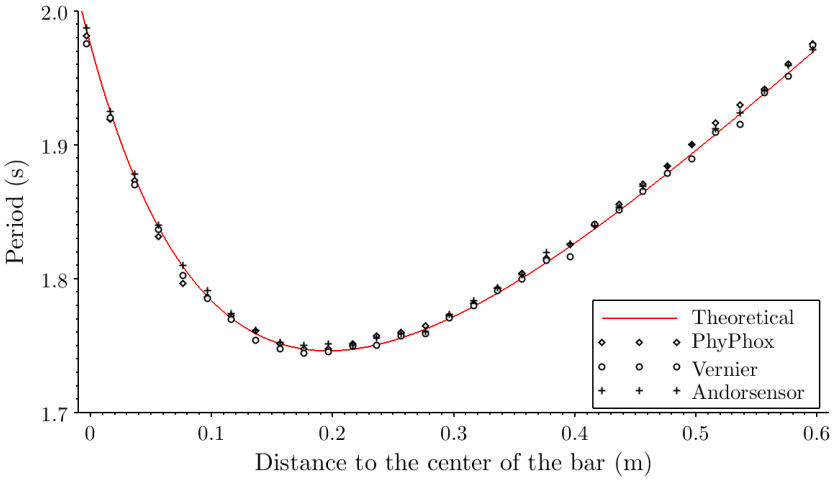




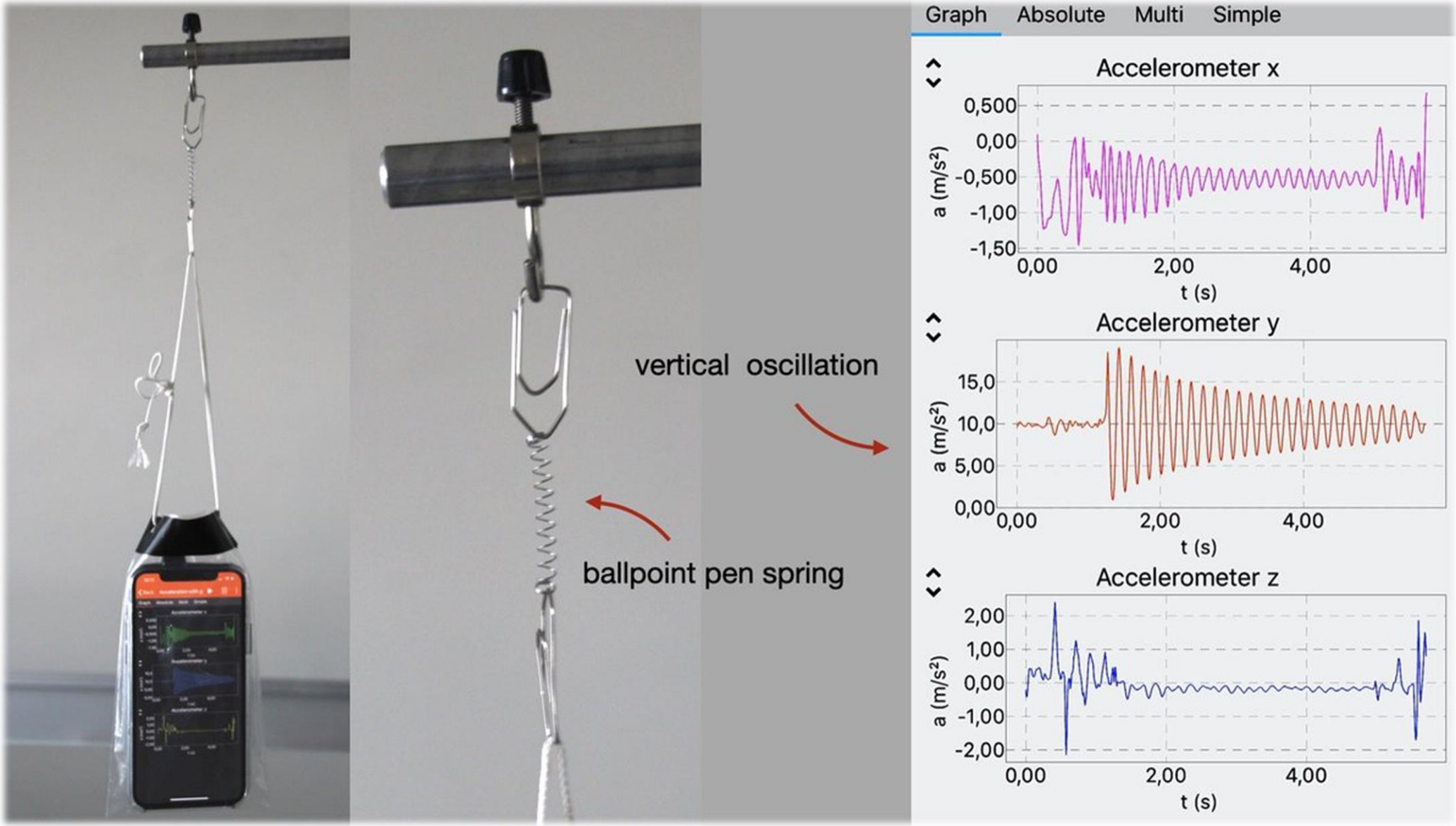
Mesure the pendulum period:







Oscillatory motion of a spring:



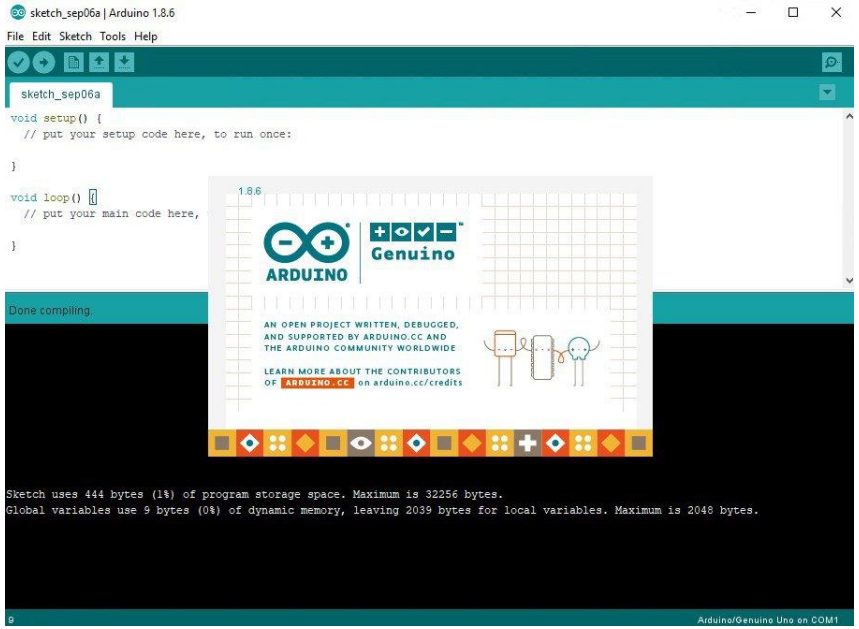
What else ?

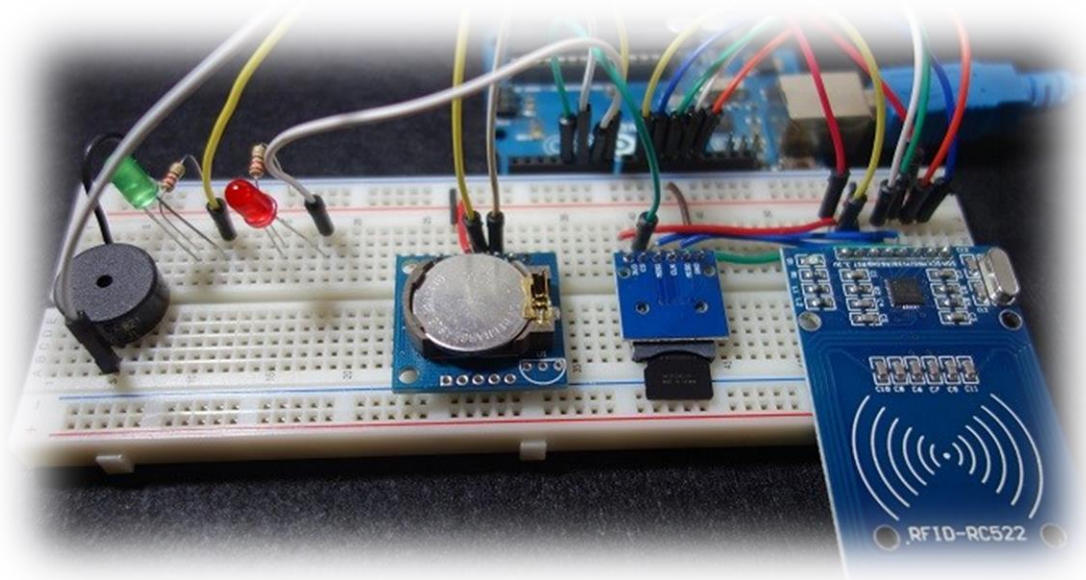
Next level
Master ELN development kits

Instrumentation & measurement

Control and Automatism

Robotics and Artificial Intelligence


sketch_sep06a | Arduino 1.8.6
File Edit Sketch Tools Help
sketch_sep06a
void setup() {
// put your setup code here, to run once:
}
void loop() {
// put your main code here,
}
1.8.6
ARDUINO
Genuino
AN OPEN PROJECT WRITTEN, DEBUGGED, AND SUPPORTED BY ARDUINO.CC AND THE ARDUINO COMMUNITY WORLDWIDE
LEARN MORE ABOUT THE CONTRIBUTORS OF ARDUINO.CC on arduino.cc/credits
Done compiling.
Sketch uses 444 bytes (1%) of program storage space. Maximum is 32256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for local variables. Maximum is 2048 bytes.
Arduino/Genuino Uno on COM1


RFID-RC522

We have created the Arduino library “phyphox BLE” to easily plot data from your Arduino or ESP32 in phyphox or receive sensor data from phyphox for your Arduino project.

In the most simple example, you only need few lines to submit a value to be plotted in phyphox.

Search ...

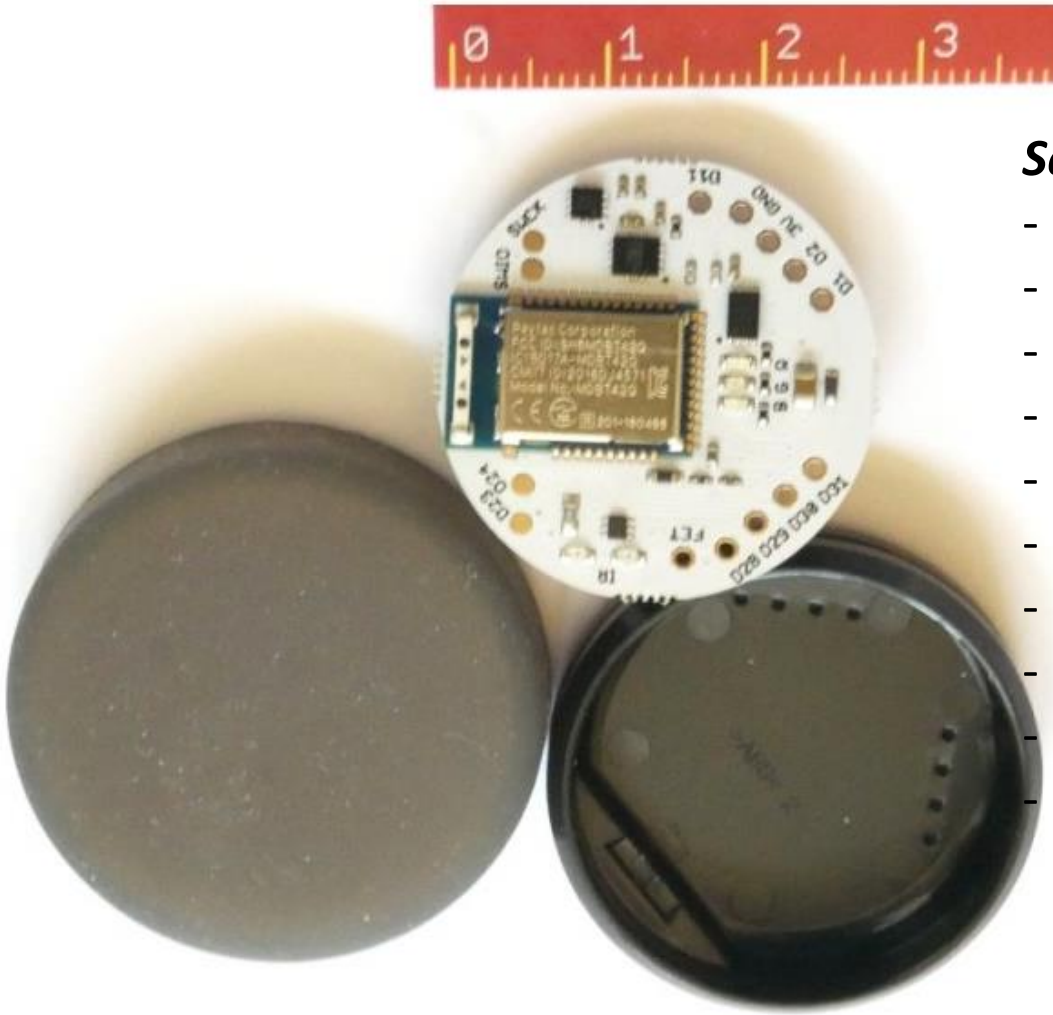
RECENT POSTS

- Phyphox selected for final funding phase of “Wirkung hoch 100
- CO_2 Monitor Update
- Aestanation 2021
- Aachen phyphox summer training
- Mini-Series on Spectra

ARCHIVES

- September 2021
- August 2021
- July 2021
- May 2021
- April 2021
- February 2021

Puck.js
electronic cookie



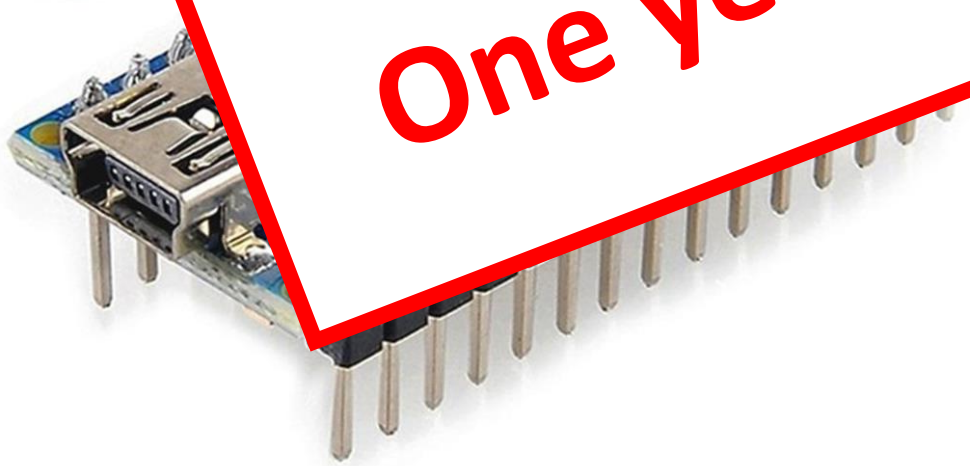
Sensors:

- ***Accelerometer***
- ***Gyroscope***
- ***Magnetometer***
- ***Thermometer***
- ***Luxometer***
- ***Bluetoth Low Energy***
- ***IR Transmitter***
- ***Weight: 14-20g***
- ***Dim: Ø36x12.5mm***
- ***Cost: ~ 35$***

Puck.js
electronic cookie

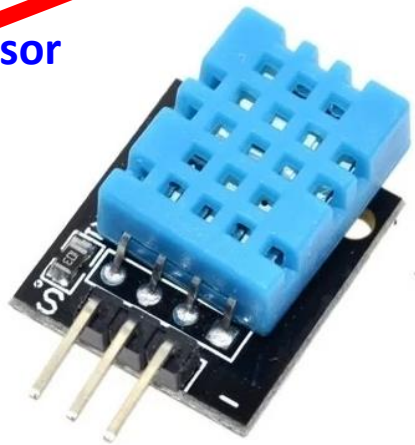
You can do the same

ARDUINO NANO (basic) + Sensors



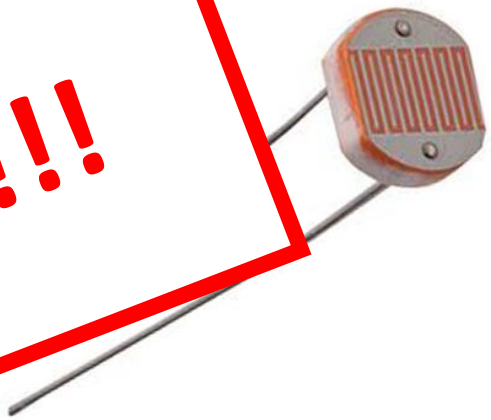
IMU (Inertial Measurement Unit)

3/6/9 axis



and temperature sensor

Barometric and pressure sensor



One year project challenge!!!

Scientific toolbox skills for success (3-5years):

Deutscher Akademischer Austausch Dienst
German Academic Exchange Service