Inhalt

Geometric considerations

A body without gravitational mass but only an inertial mass of 1 kg may be in a laboratory system on the surface of the earth.

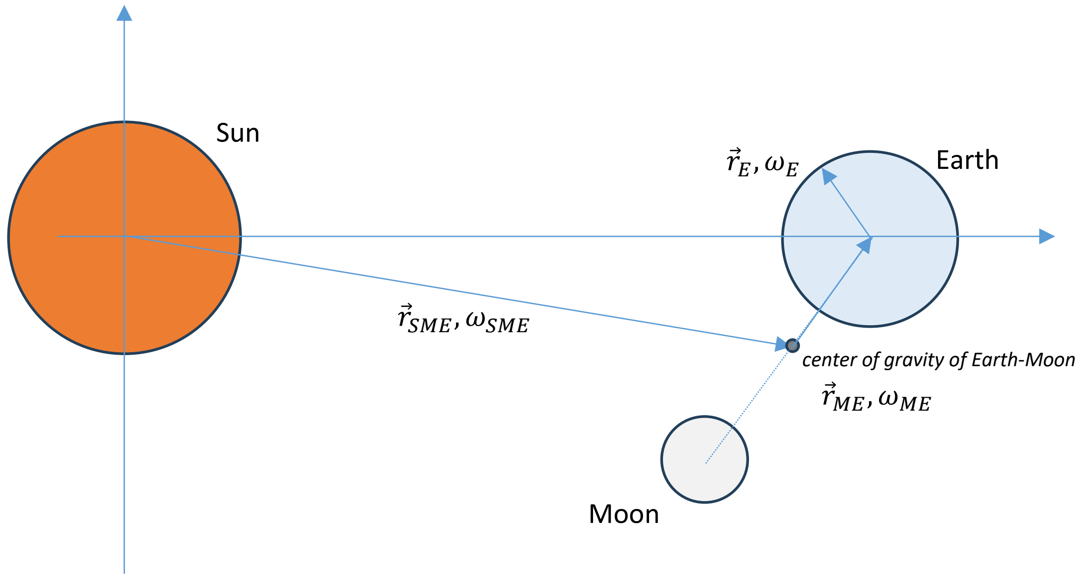
What forces act on this body, considering the movement of the earth around the sun, the movement of the earth and moon around their common center of gravity, and the earth's rotation?

We simplify by making the following assumptions:

- The body is located at the equator
- Earth and moon rotate around the sun
- The axes of rotation of the Earth and the Moon are parallel and perpendicular to this plane

Situation

Note: The display is not to scale.



The center of gravity of Earth and Moon rotates in a circular orbit around the Sun.

Earth and Moon rotate around their common center of gravity, which is still within the Earth's radius.

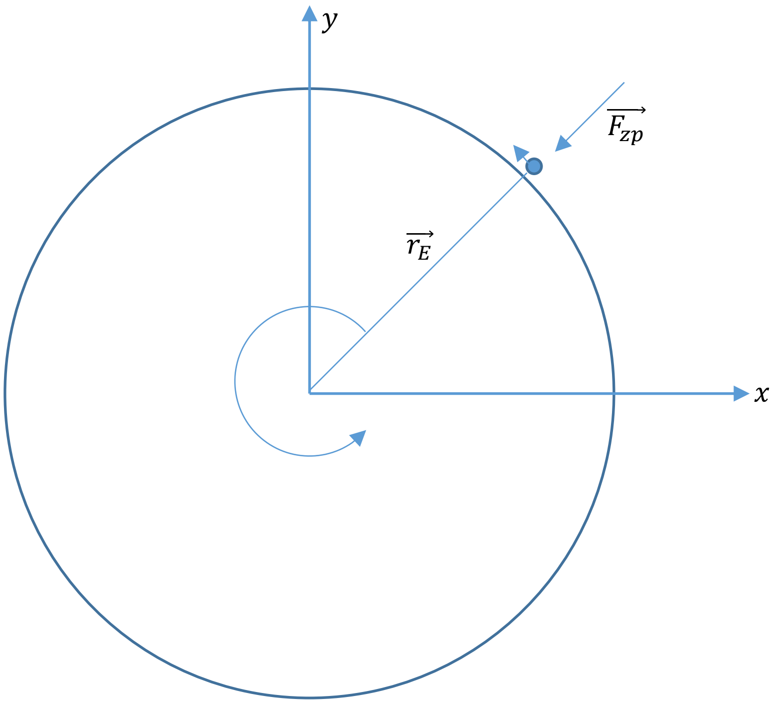
A point on the Earth's surface rotates around the center of the Earth.

The total motion is obtained by vector addition of the three individual motions.

We work in a two-dimensional model with the axes of rotation all perpendicular to the drawing plane.

Earth

If a body moves on a circular path, a centripetal force is required to keep it on this path. If a body has heavy mass, this force is provided by gravity.



In this model, we get the trajectory, calculated from the origin in the earth $\overrightarrow{r_E}(t)$:

$$\overrightarrow{r_E}(t) = r_E \cdot \begin{pmatrix} cos(\omega_E \cdot t) \\ sin(\omega_E \cdot t) \end{pmatrix}$$

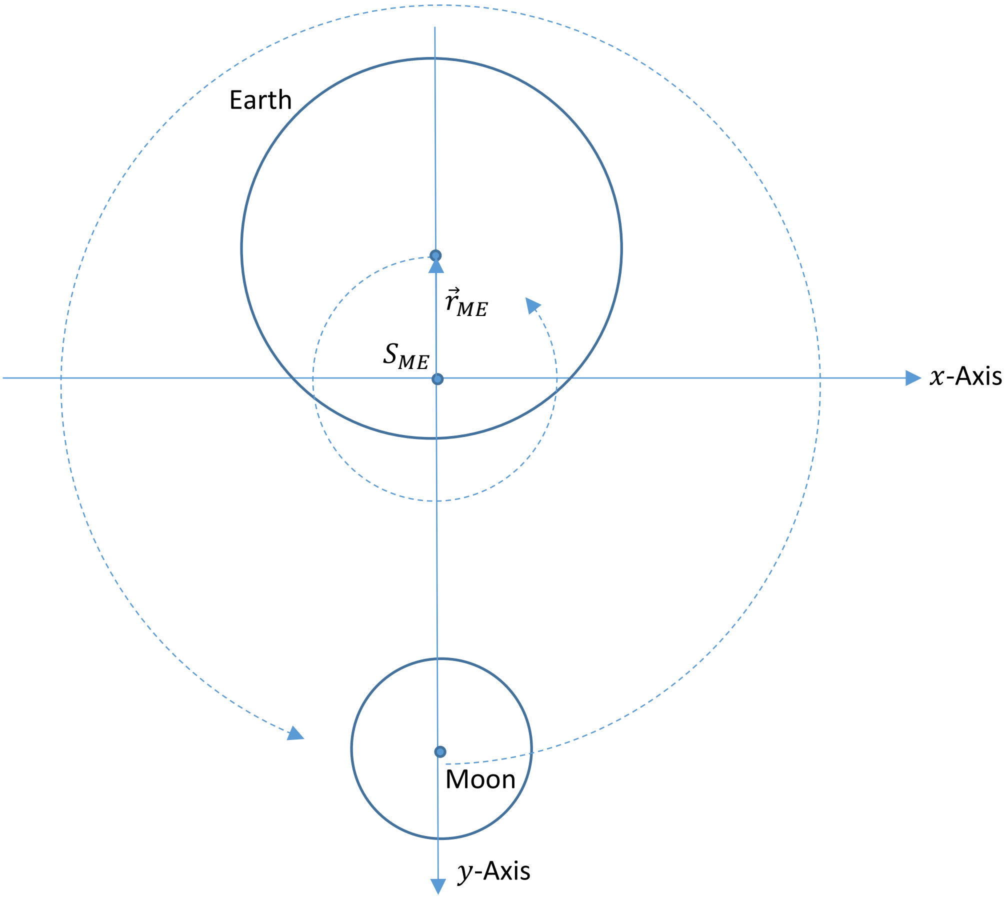
$$r_E = 6.4 \cdot 10^6 \; m$$

$$T_E = 86400 \; s$$

$$\omega_E = \frac{2\pi}{T_E} = \frac{2\pi}{86400}$$

Earth – Moon

The center of the Earth rotates around the common center of gravity with an orbital period of 28 days.



$$\overrightarrow{r_{ME}}(t) = r_{ME} \cdot \begin{pmatrix} cos(\omega_{ME} \cdot t) \\ sin(\omega_{ME} \cdot t) \end{pmatrix}$$

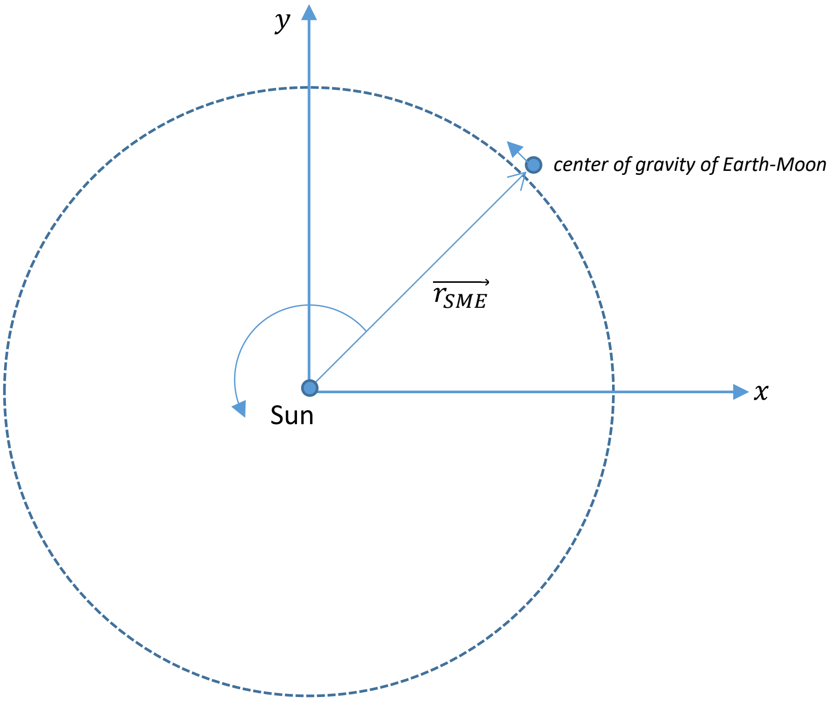
$$r_{ME} = 4.7 \cdot 10^6 \; m$$

$$T_{ME} = 2.419.200 \; s$$

$$\omega_{ME} = \frac{2\pi}{T_{ME}} = \frac{2\pi}{2.419.200}$$

Sun – Earth – Moon

The center of gravity of Earth and Moon rotates around the Sun.



In this model, we get the coordinates, calculated from the origin in the sun:

$$r_{SME}(t) = r_{SME} \cdot \begin{pmatrix} cos(\omega_{SME} \cdot t) \\ sin(\omega_{SME} \cdot t) \end{pmatrix}$$

$$r_{SME} = 1{,}49598 \cdot 10^{11}\ meter$$

$$T_{SME} = 3{,}1536 \cdot 10^{7}\ seconds$$

$$\omega_{SME} = \frac{2\pi}{T_{SME}},$$

Total Movement

We add the three individual movements to the total movement of our fictitious body around the sun $\vec{r}(t)$:

$$\vec{r}(t) = \vec{r}_{SME}(t) + \vec{r}_{ME}(t) + \vec{r}_E(t) =$$

$$r_{SME} \cdot \begin{pmatrix} cos(\omega_{SME} \cdot t) \\ sin(\omega_{SME} \cdot t) \end{pmatrix} + r_{ME} \cdot \begin{pmatrix} cos(\omega_{ME} \cdot t) \\ sin(\omega_{ME} \cdot t) \end{pmatrix} + r_E \cdot \begin{pmatrix} cos(\omega_E \cdot t) \\ sin(\omega_E \cdot t) \end{pmatrix}$$

We get the speed:$v(t)$

$$v(t) = \frac{d}{dt}\left(r_{SME} \cdot \begin{pmatrix} cos(\omega_{SME} \cdot t) \\ sin(\omega_{SME} \cdot t) \end{pmatrix} + r_{ME} \cdot \begin{pmatrix} cos(\omega_{ME} \cdot t) \\ sin(\omega_{ME} \cdot t) \end{pmatrix} + r_E \cdot \begin{pmatrix} cos(\omega_E \cdot t) \\ sin(\omega_E \cdot t) \end{pmatrix} \right) =$$

$$r_{SME} \cdot \omega_{SME} \cdot \begin{pmatrix} -sin(\omega_{SME} \cdot t) \\ cos(\omega_{SME} \cdot t) \end{pmatrix} + r_{EM} \cdot \omega_{ME} \cdot \begin{pmatrix} -sin(\omega_{ME} \cdot t) \\ cos(\omega_{ME} \cdot t) \end{pmatrix} + r_E \cdot \begin{pmatrix} -sin(\omega_E \cdot t) \\ cos(\omega_E \cdot t) \end{pmatrix}$$

We get the acceleration $a(t)$:

$$a(t) = \frac{d}{dt}\left(r_{SME} \cdot \omega_{SME} \cdot \begin{pmatrix} -sin(\omega_{SME} \cdot t) \\ cos(\omega_{SME} \cdot t) \end{pmatrix} + r_{ME} \cdot \omega_{ME} \cdot \begin{pmatrix} -sin(\omega_{ME} \cdot t) \\ cos(\omega_{ME} \cdot t) \end{pmatrix} + r_E \cdot \begin{pmatrix} -sin(\omega_E \cdot t) \\ cos(\omega_E \cdot t) \end{pmatrix} \right) =$$

$$-r_{SME} \cdot {\omega_{SME}}^2 \cdot \begin{pmatrix} cos(\omega_{SME} \cdot t) \\ sin(\omega_{SME} \cdot t) \end{pmatrix} - r_{ME} \cdot {\omega_{ME}}^2 \cdot \begin{pmatrix} cos(\omega_{ME} \cdot t) \\ sin(\omega_{ME} \cdot t) \end{pmatrix} - r_E \cdot {\omega_E}^2 \cdot \begin{pmatrix} cos(\omega_E \cdot t) \\ sin(\omega_E \cdot t) \end{pmatrix}$$

We use numerical values:

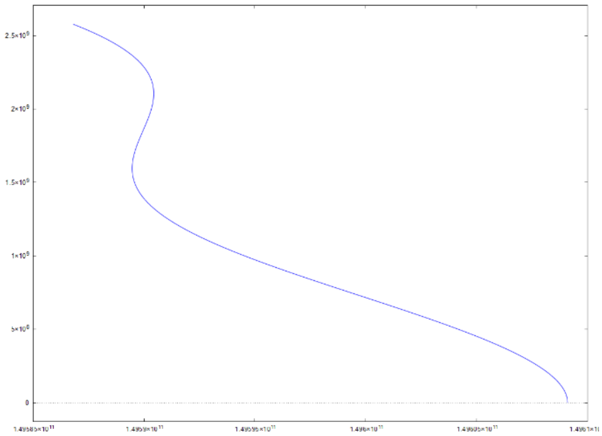
$$r_E = 6{,}4 \cdot 10^6, \qquad r_{EM} = 4{,}7 \cdot 10^6, \qquad r_{SME} = 1{,}49598 \cdot 10^{11}$$

$$\omega_E = \frac{2\pi}{86.400s}, \qquad \omega_{ME} = \frac{2\pi}{2419200s}, \qquad \omega_{SME} = \frac{2\pi}{3{,}1536 \cdot 10^7}$$

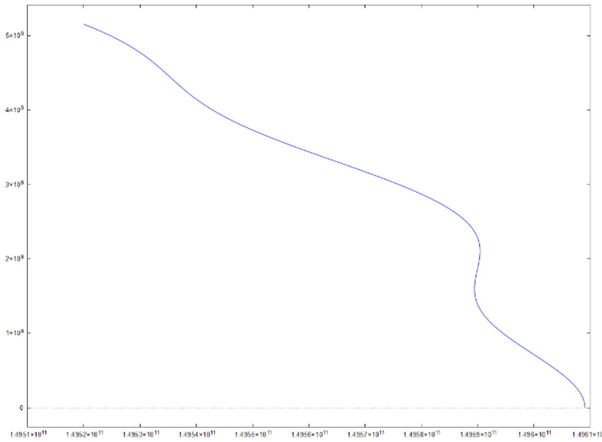
Since we calculate in the unit meters and seconds and the inertial mass was assumed to be 1 kg, the acceleration is equal to the necessary force.

The associated graphs. Note scales on x and y are not the same.

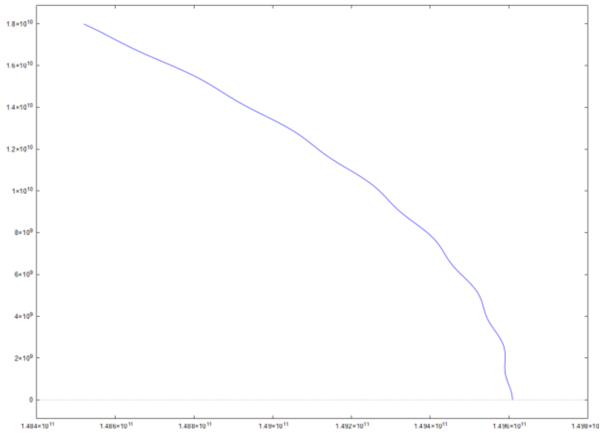
Graph of the position for one day



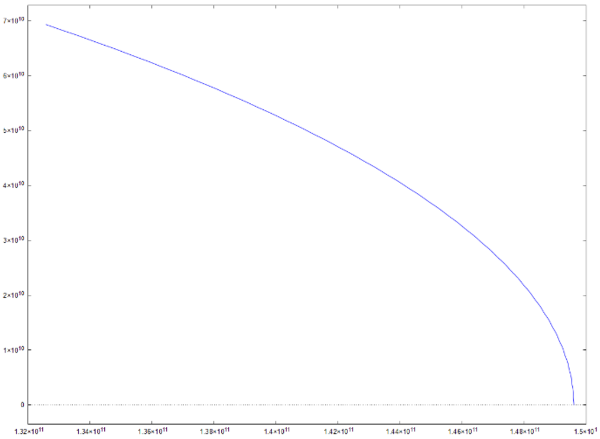
… for two days



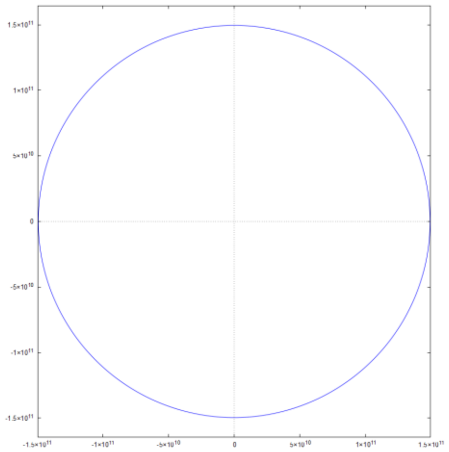
… for one week



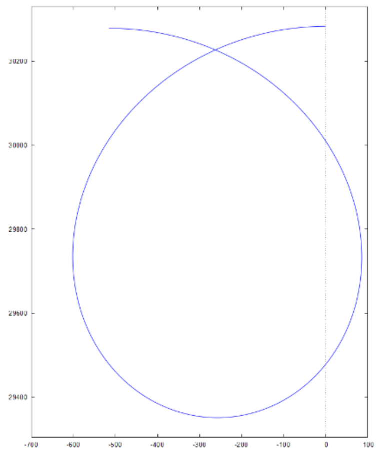
… for four weeks



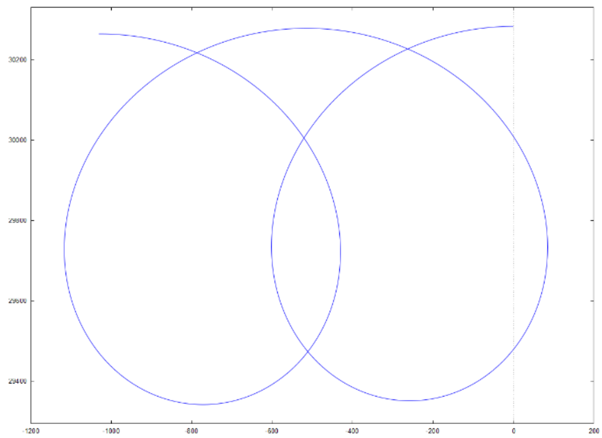
Graph of position for one year



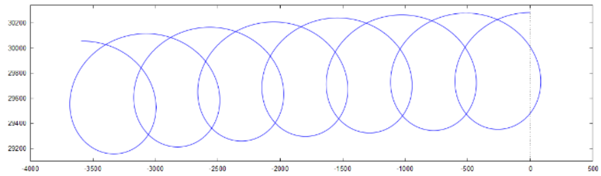
Speed one day



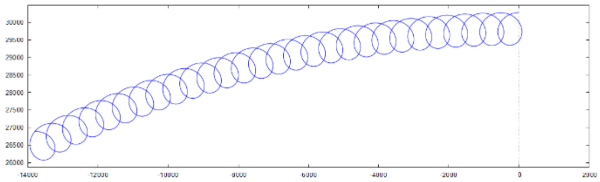
Speed 2 days



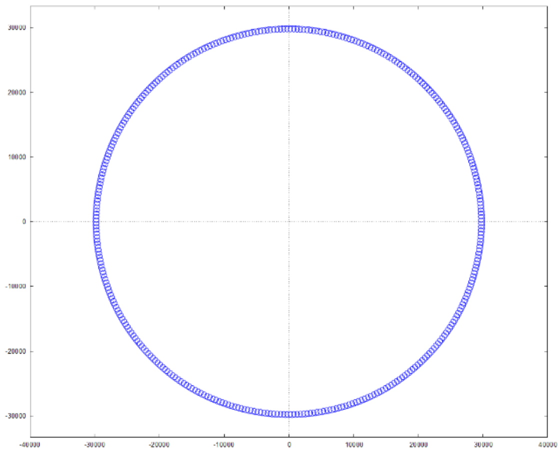
Speed 7 days



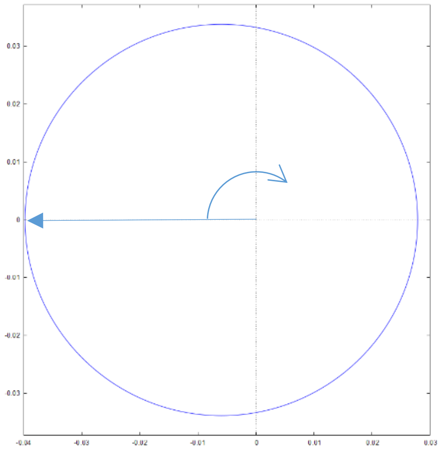
Speed 28 days



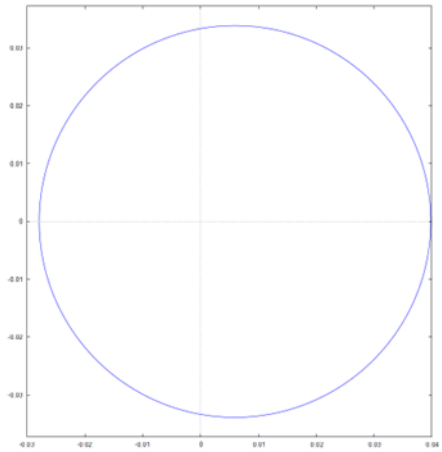
Speed one year



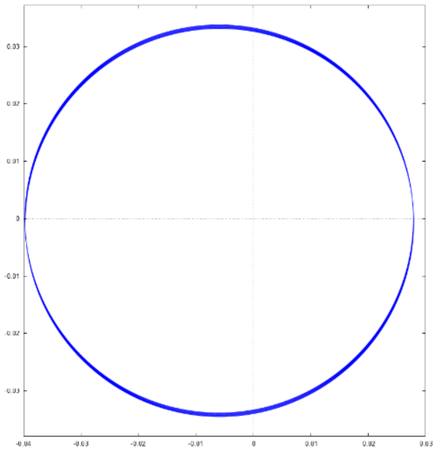
Acceleration for one day



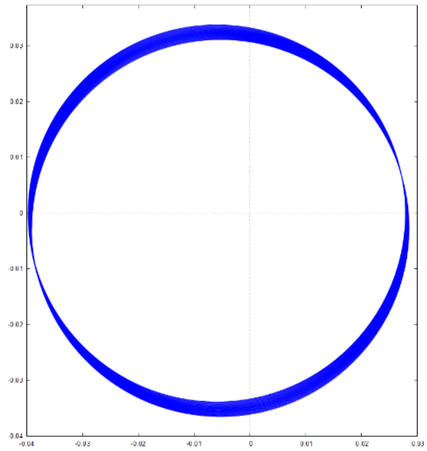
Acceleration for one day after 6 months



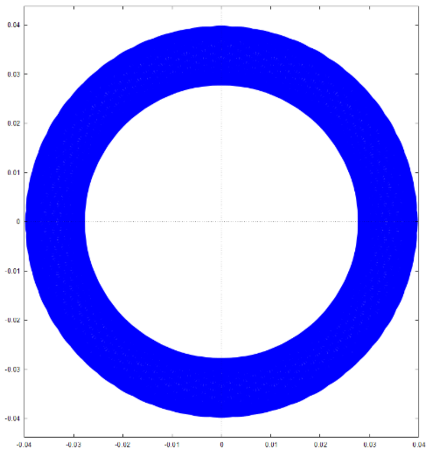
Acceleration for 7 days



Acceleration for 28 days



Acceleration for one year



Force

In the chosen example with fictitious inertial mass 1 kg the force in Newtons results directly from the acceleration. We examine the amounts of the individual force components Earth rotation, Earth-Moon rotation and rotation Earth-Moon around the Sun.

Centripetal force Earth: $0.03384637997630095\ N$

Centripetal force Earth-Moon: $0.0000317039991008877 4\ N$

Centripetal force Sun: $0.005938439143946648\ N$

The maximum force, all forces pointing in one direction:

$$0.03981652311934849\ N$$

The minimum force, Earth versus Sun and Earth-Moon:

$$0.027876236833253416\ N$$

The Observer on Earth

So far, we have worked in a resting inertial frame with its origin in the Sun. The observer on Earth is in a coordinate system that follows the rotation of a fixed point on the Earth's surface.

For the body on the Earth's surface, the centripetal force necessary to compensate for the Earth's rotation is constantly perpendicular to the Earth's center.

Since the Earth rotates to the left the centripetal vectors of the other two bodies appear to rotate to the right.

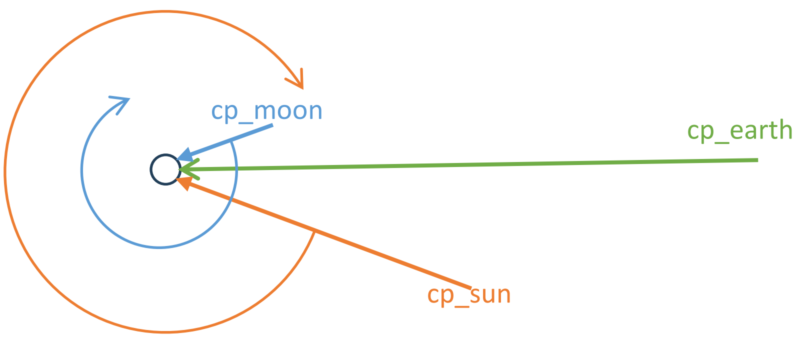
Because of the rotation of the Earth around the common center, the centripetal vector of the Moon accommodates the rotation, and after 27 days the initial state is reached. The apparent period duration is 27 days.

The same applies to the rotation of the Earth around the Sun, the apparent period duration is 364 days (instead of the assumed 365 days for one year).

This gives angular velocities for the centripetal forces in the direction of the Sun and Moon resp. the common center of rotation of the Moon and Earth:

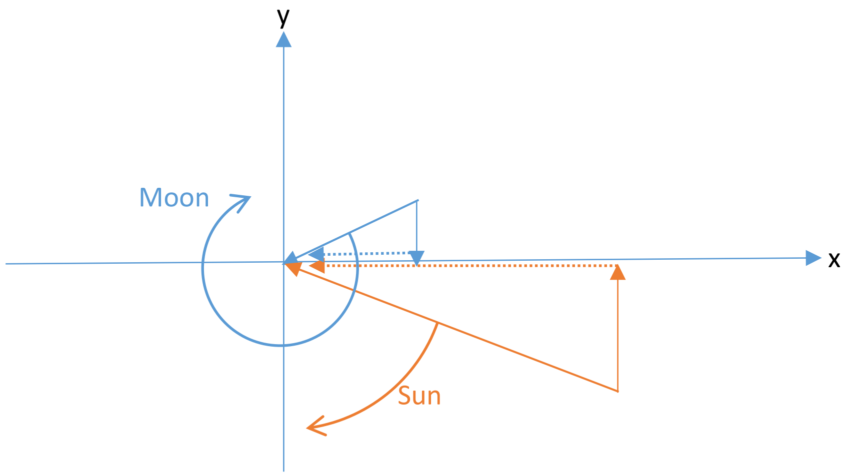
$$\omega'_{ME} = \frac{2\pi}{82.800}, \qquad \omega'_{SME} = \frac{2\pi}{86.162}$$

The constant centripetal force of the Earth is modulated with these forces:



Scaled to Earth's centripetal force	
Centripetal force Earth:	$1\,N = 100\%$
Centripetal force Earth-Moon:	$0{,}0009366\,N \approx 0{,}1\%$
Centripetal force Sun:	$0{,}1754515\,N \approx 18\%$

We only register the perpendicular parts, the projections of the forces of the sun and moon onto the perpendicular resp. centripetal force of the earth:



Modulation Sun:

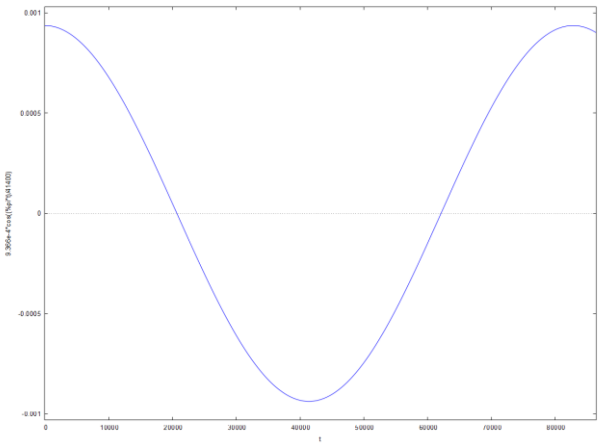
$$0.1754515 \cdot cos\left(t \cdot \frac{2 \cdot \pi}{86.162}\right)$$

Modulation Moon:

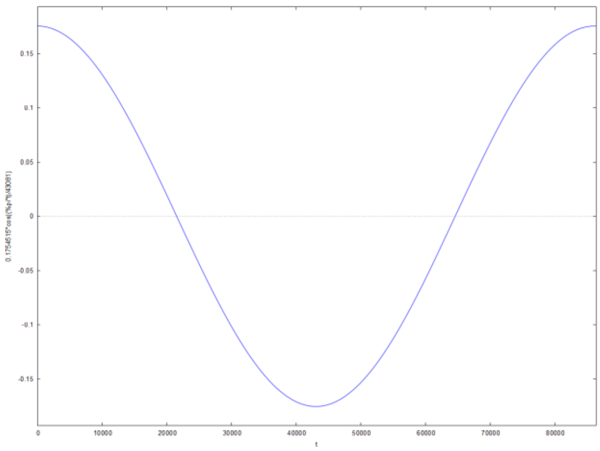
$$0.0009366 \cdot cos\left(t \cdot \frac{2 \cdot \pi}{82.800}\right)$$

Let's look at this modulation graphically.

Modulation moon one day

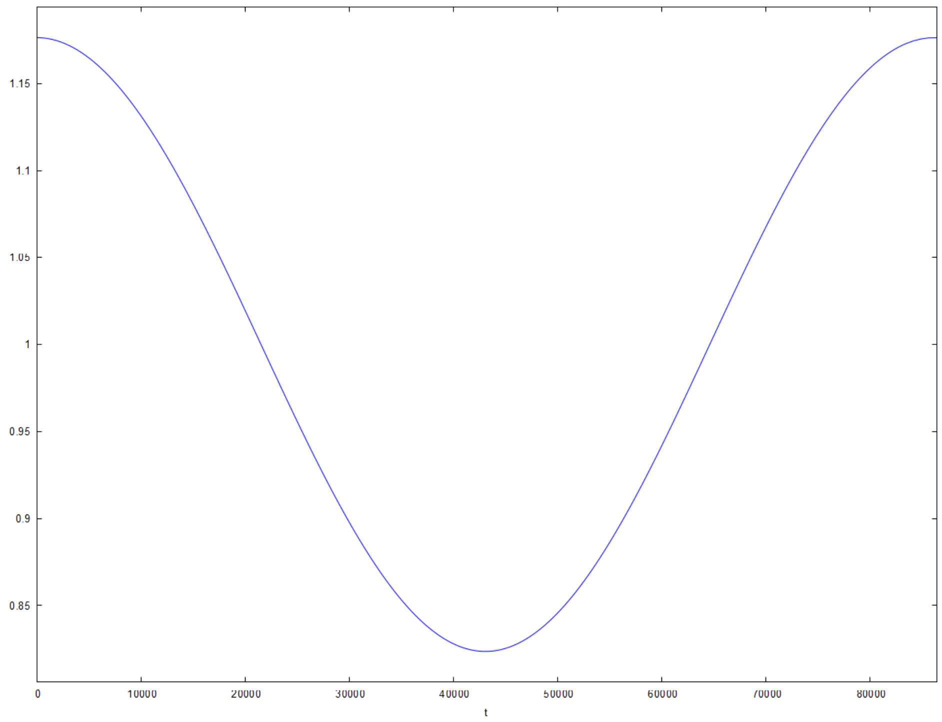


Modulation Sun One Day

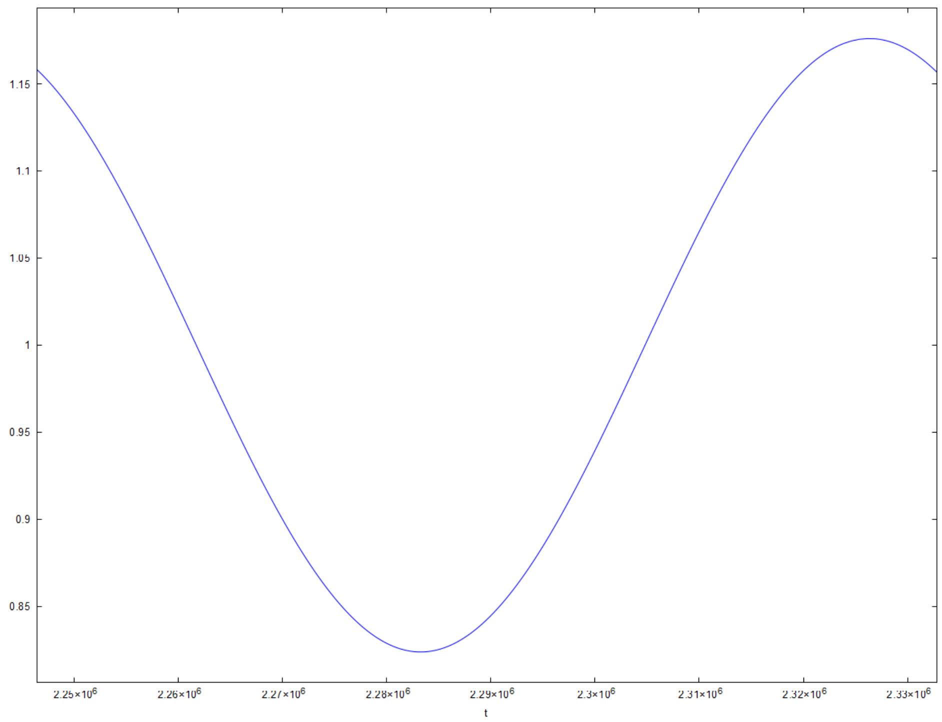


Note: The scales are different as well as the phase shift.

Modulation of both forces for one day at the beginning of the month:



Modulation of both forces for one day at the end of the month:



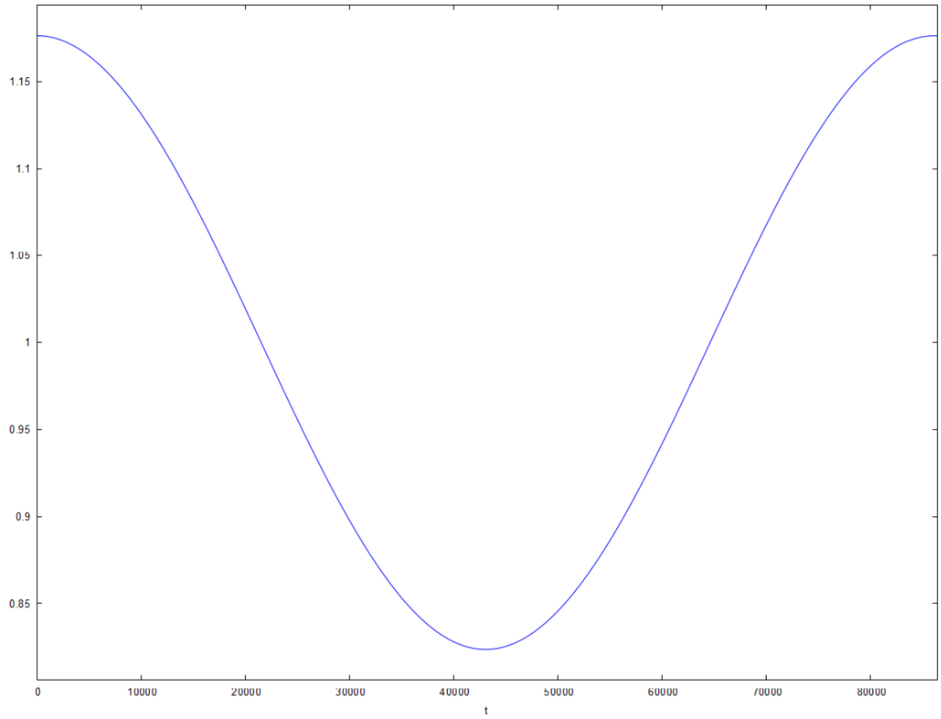
Experimental setup

Summary of the geometric considerations: A fictious body without gravitational mass that has inertial mass only with an amount of $1\ kg$ needs the following centripetal forces to be held on place:

Centripetal force Earth:	$0.033846\ N$
Centripetal force Earth-Moon:	$0.000032\ N$
Centripetal force Sun:	$0.005938\ N$

The centripetal force of earth is constant and therefore not easy to detect, but the centripetal forces of moon and sun are varying with time:

Modulation of both forces for one day at the beginning of the month



Note: units relative to centripetal force of earth.

The formation of the solar system

The generally accepted idea is that sun and planets were formed around 4.6 billion years ago, simultaneously or shortly after one another, through the collapse of a rotating nebula of gas and dust.

Postulate: Part of this rotating nebula of gas and dust might be matter with inertial mass only.

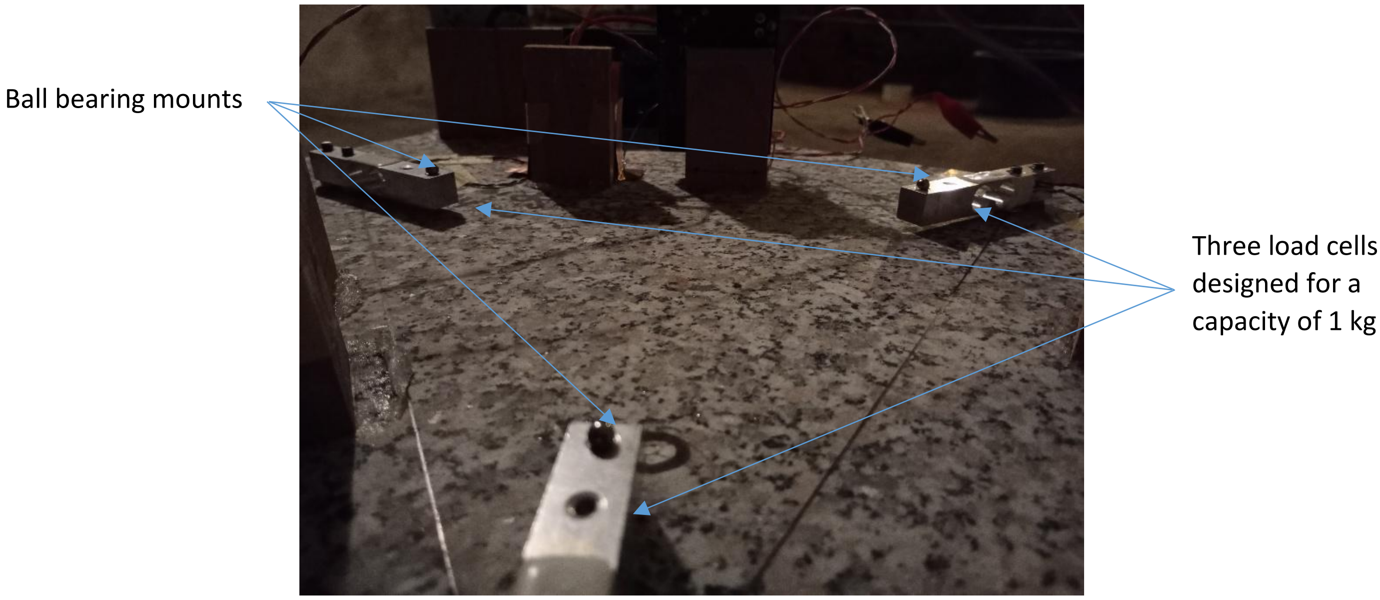
Since we postulate that this matter has all properties of normal matter except gravity, it doesn't participate directly in the formation process caused by gravity that formed the planets.

But it could participate indirectly. Through collisions, adhesion and cohesion with normal matter, some of it can become part of the planets, embedded in solid matter.

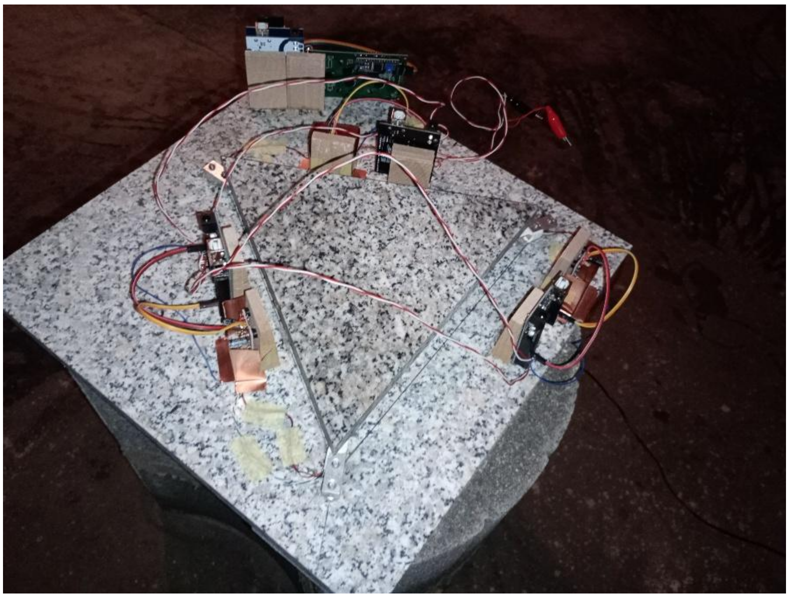
The part of matter with inertial mass only that was not captured in this way later was blown out of the solar system by the radiation of the sun.

We can check our postulate by weighing different solids. If a solid does not show the modulation it does not contain matter with inertial mass only.

Experimental set #1

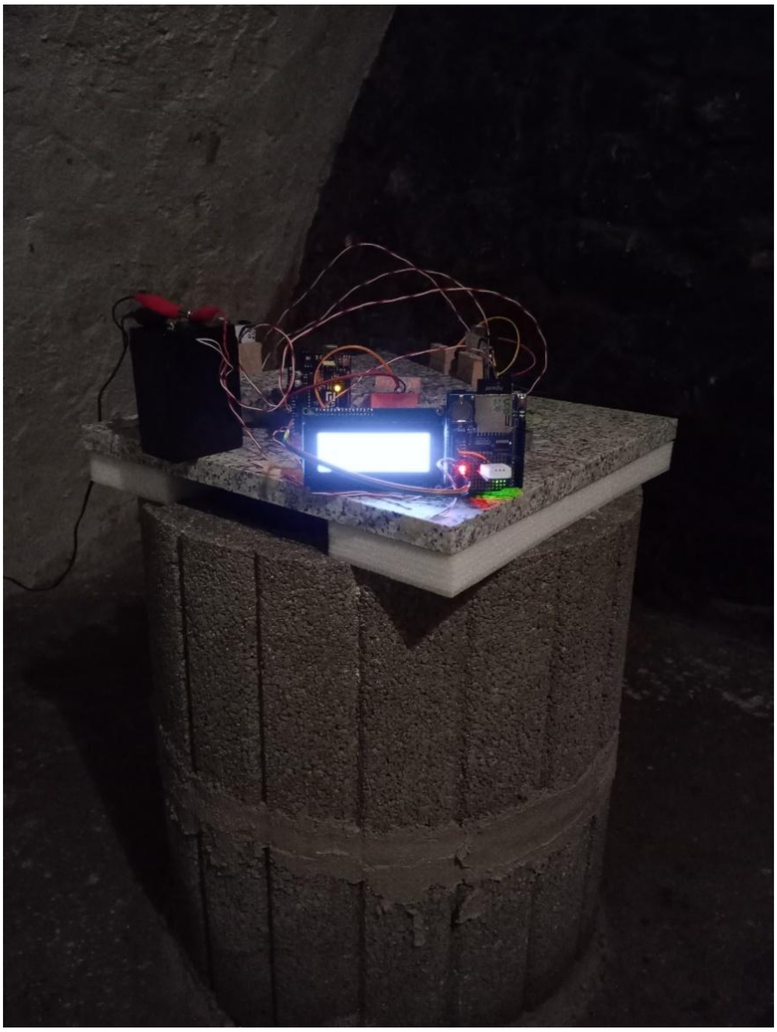


Experimental set #2



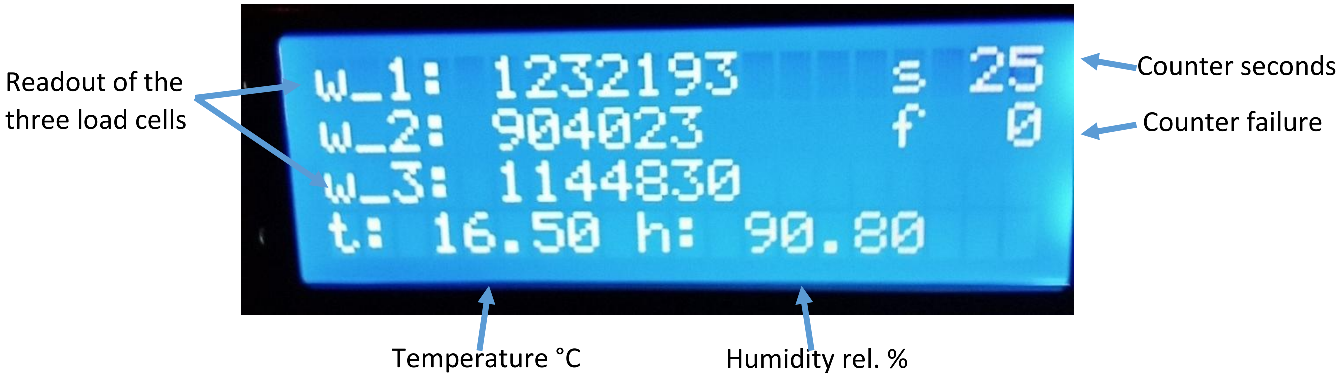
The marble probe with mass around 3 kg mounted

Experimental set #3



The whole set resting on a concrete base

Experimental set #4



Experimental set #5

The cellar, about 4 m below ground

Details of the measuring equipment

We use a 24-bit adc-converter hx711 with 8-bit oversampling. This roughly should give a resolution of 2^{-24}, about 10^{-7} for a maximum force of $10\ N$.

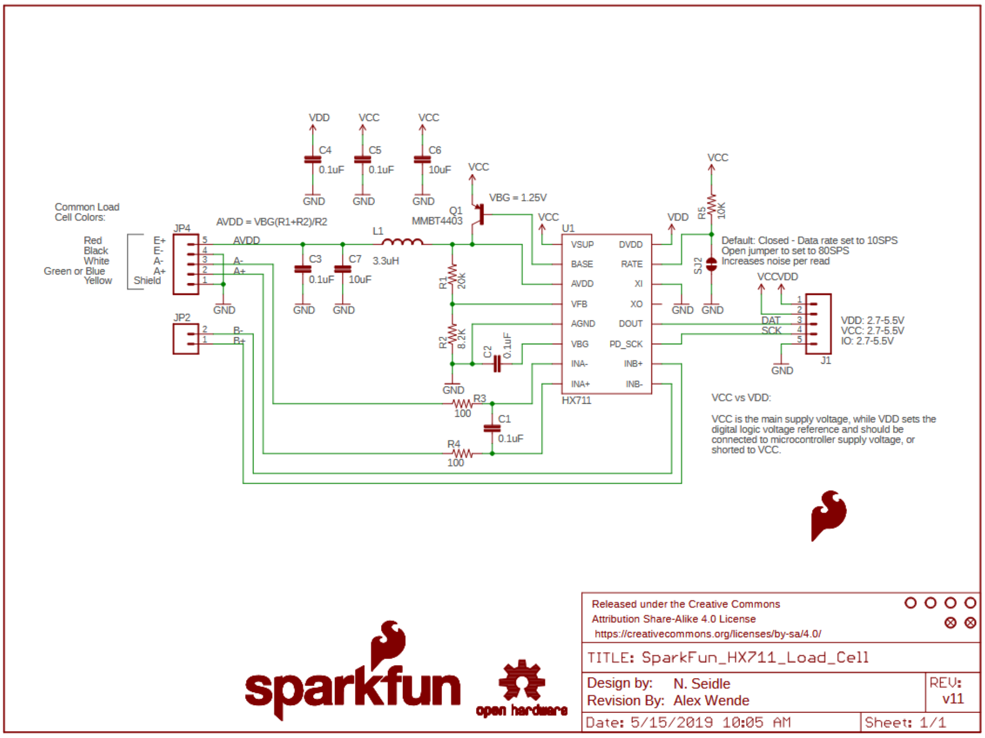
This should allow the detection of modulation forces down to $10^{-6}\ N$, one measuring point corresponds to $10^{-6}\ N$ or one micro-Newton.

Going back to our calculation and using that for a body of inertial mass 1 kg the resulting modulating force is about $0.006\ N$. This gives the limit for detecting inertial mass on the order of 0.1 g.

The experimental outcome:

If we measure with this system and do not obtain a modulation on the order of 10^{-6} Newton, then the test specimen contains less than 100 milligram of matter with only inertial mass.

The schematic:



The second input “$B-$“ and “$B+$” connected to ground via two 2 $kOhm$ resistors.

Input voltage “VDD” and “VCC” stabilized by an additional 100 μF capacity.

We use four Arduino uno. Three Arduinos, the “slaves”, are connected to the weight modules hx711. They perform 256 times the measurement with a delay of 100 ms each. Then they wait for the master to request the data. Each measurement cycle needs about 30 seconds.

The master fetches the data every minute. In addition, the master measures continuously temperature and relative humidity. It then builds a data set in csv-style:

date	time	value 1	value 2	value 3	temperature	humidity

This set of data is saved to a file named month and day. Every file contains 1440 data sets.

The zip-files will be updated at the beginning of each next month.

Maybe we need the moon phases, here they are:

New moon:	full moon	New moon:	full moon
21. September 2025	7. September 2025	15. June 2026	30. June 2026
21. October 2025	7. October 2025	14. July 2026	29. July 2026
20. November 2025	5. November 2025	12. August 2026	28. August 2026
20. December 2025	5. December 2025	11. September 2026	26. September 2026
18. January 2026	3. January 2026	10. October 2026	26. October 2026
17. February 2026	1. February 2026	9. November 2026	24. November 2026
19. March 2026	3. March 2026	9. December 2026	24. December 2026
17. April 2026	2. April 2026		
16. May 2026	1. May 31. May 2026		

Data management

For every day we have a data file containing 1440 measurements for each weighting unit.

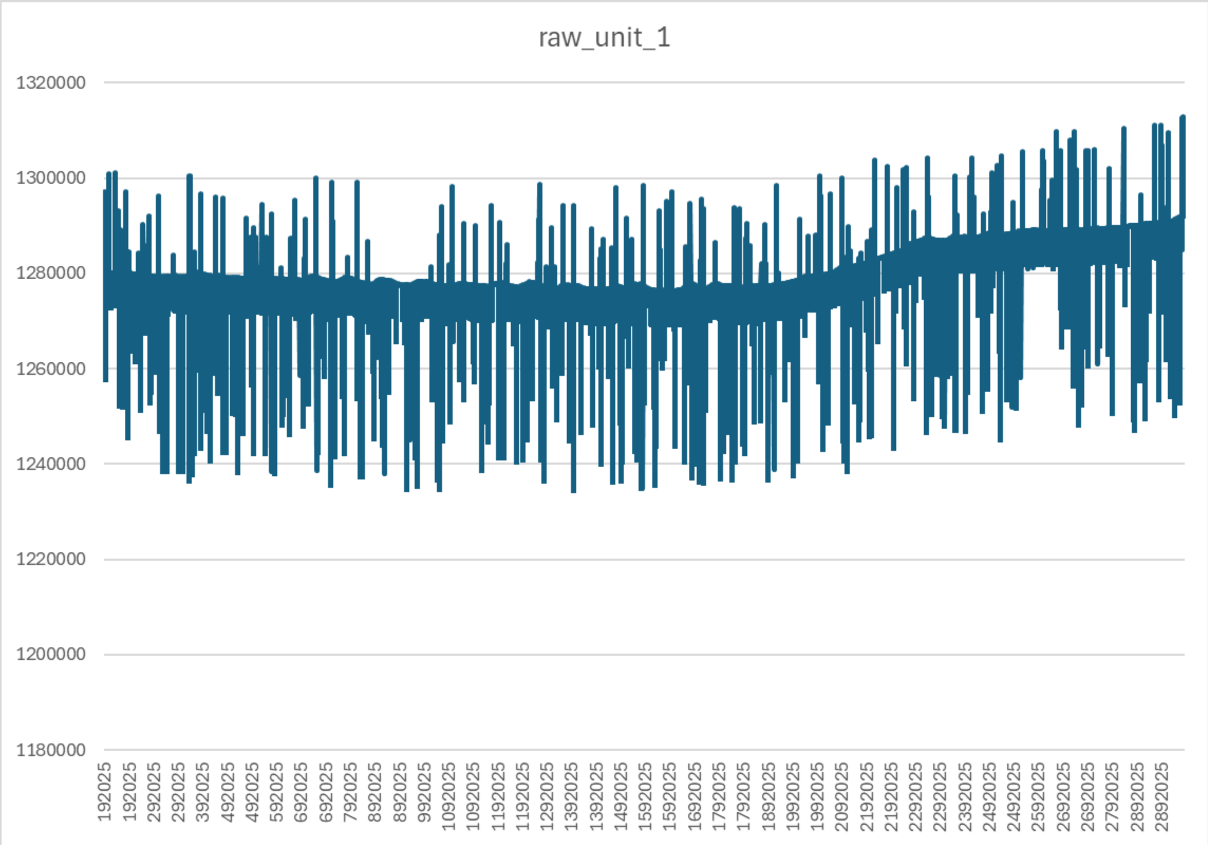
We concatenate the data files for one month to get a set of 3×44640 entries and transfer them into an excel sheet.

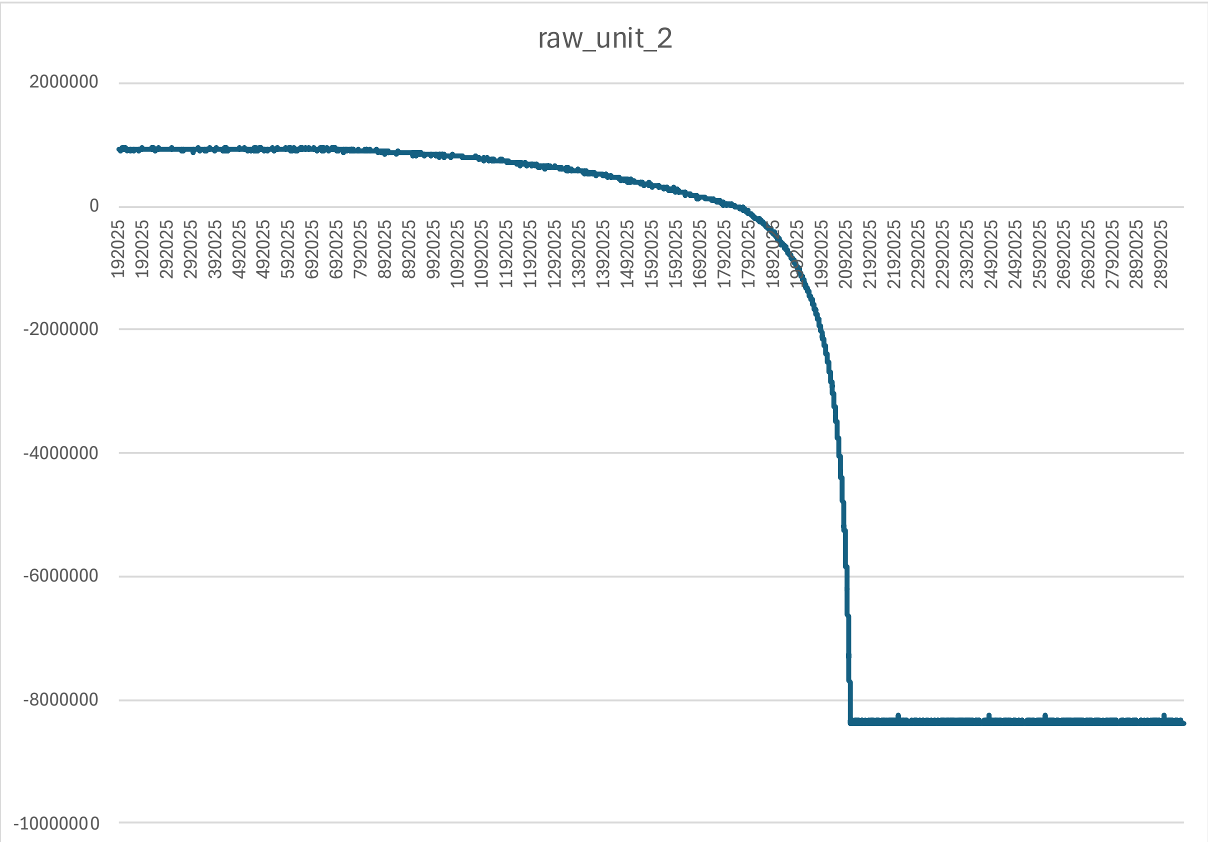
Within the excel sheet we build the average of each unit to get rid of the big numbers. We then produce three new sets containing the difference between the single measurement and the average. This results in numbers typically in the range of $-2000 \dots + 2000$.

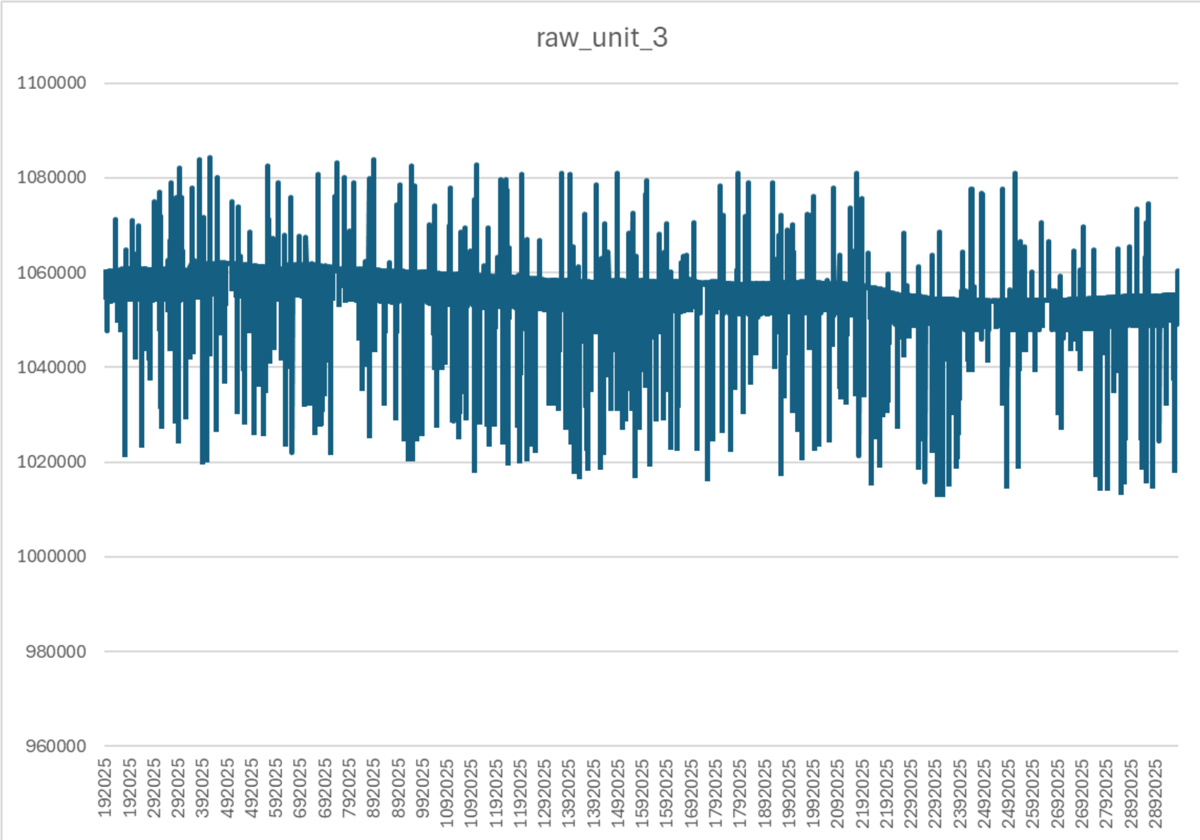
We have a lot of spikes in the data. We are not sure why, so we remove the spikes by following scheme: If the difference between one data point and the next is bigger than 1000 we omit the next data point and replace it by the previous one. We repeat this procedure until the data set seems to be clean enough to interpret it. This is done by an interpretation of the graphs of the three measuring units.

Research diary

The raw data of September 2025.

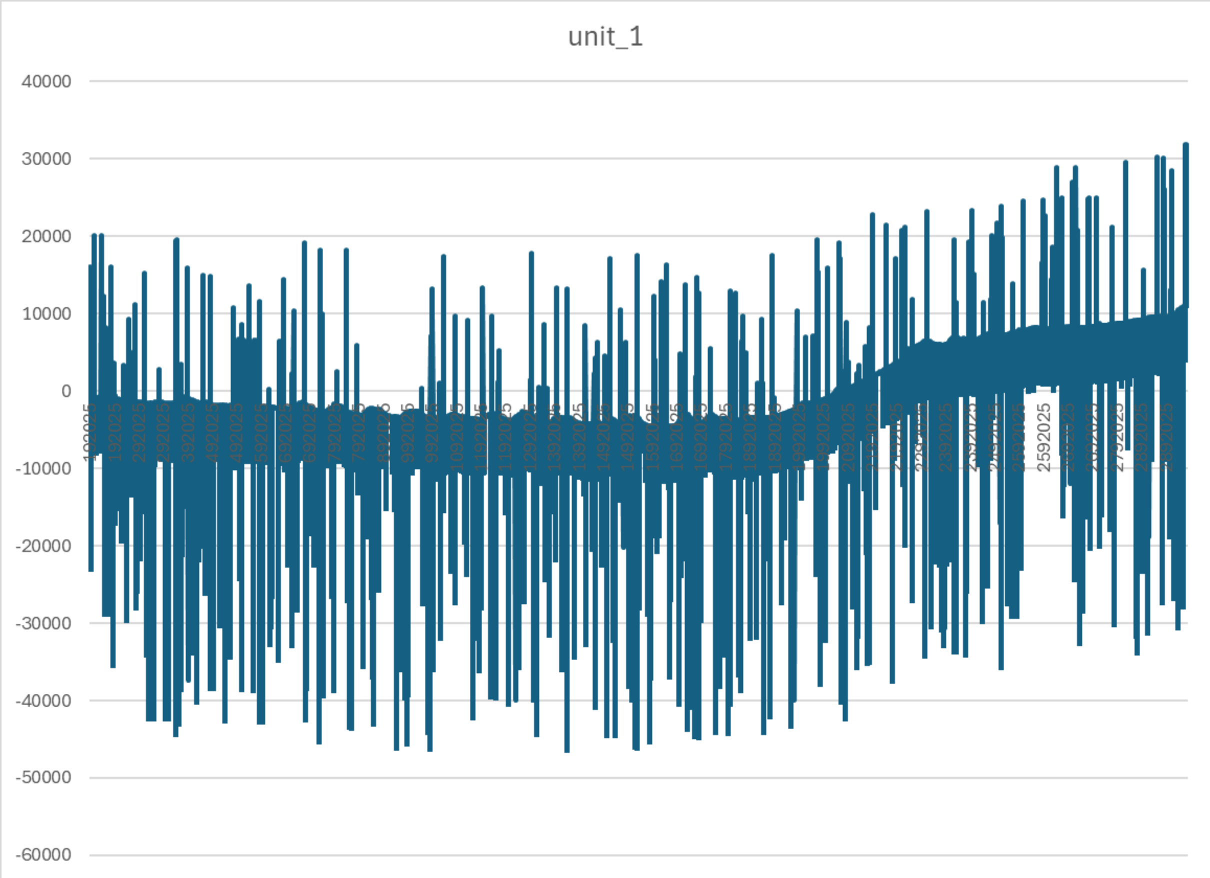


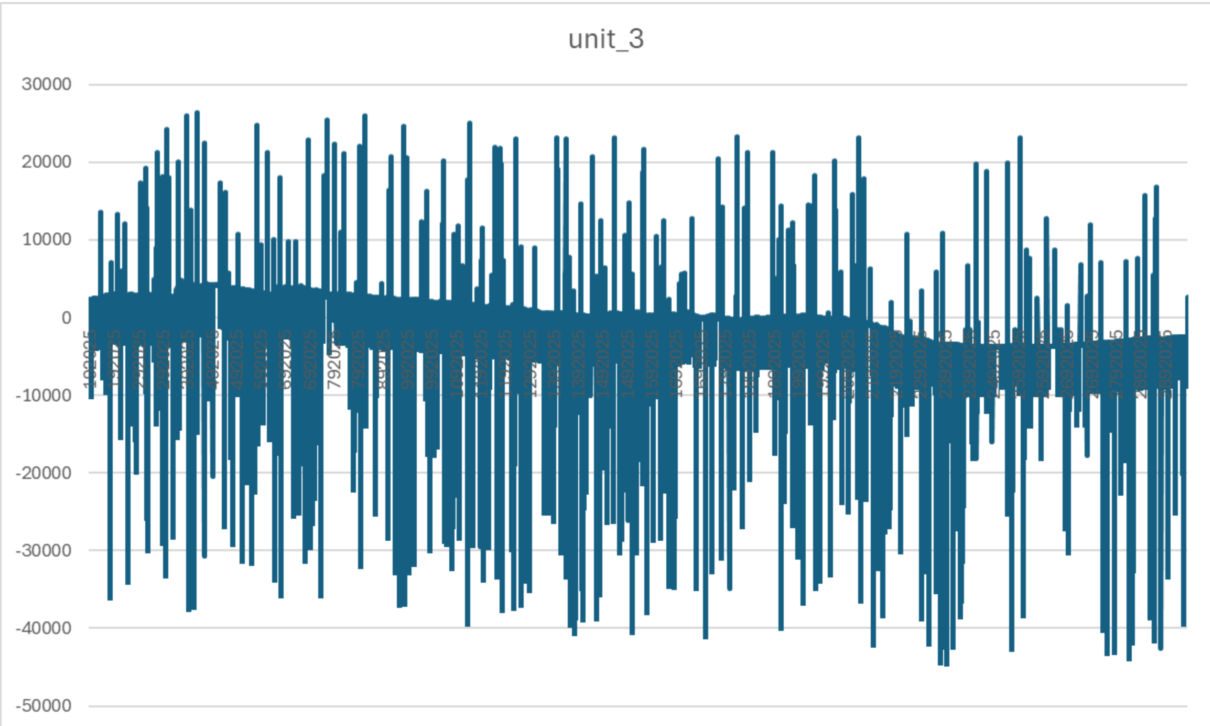




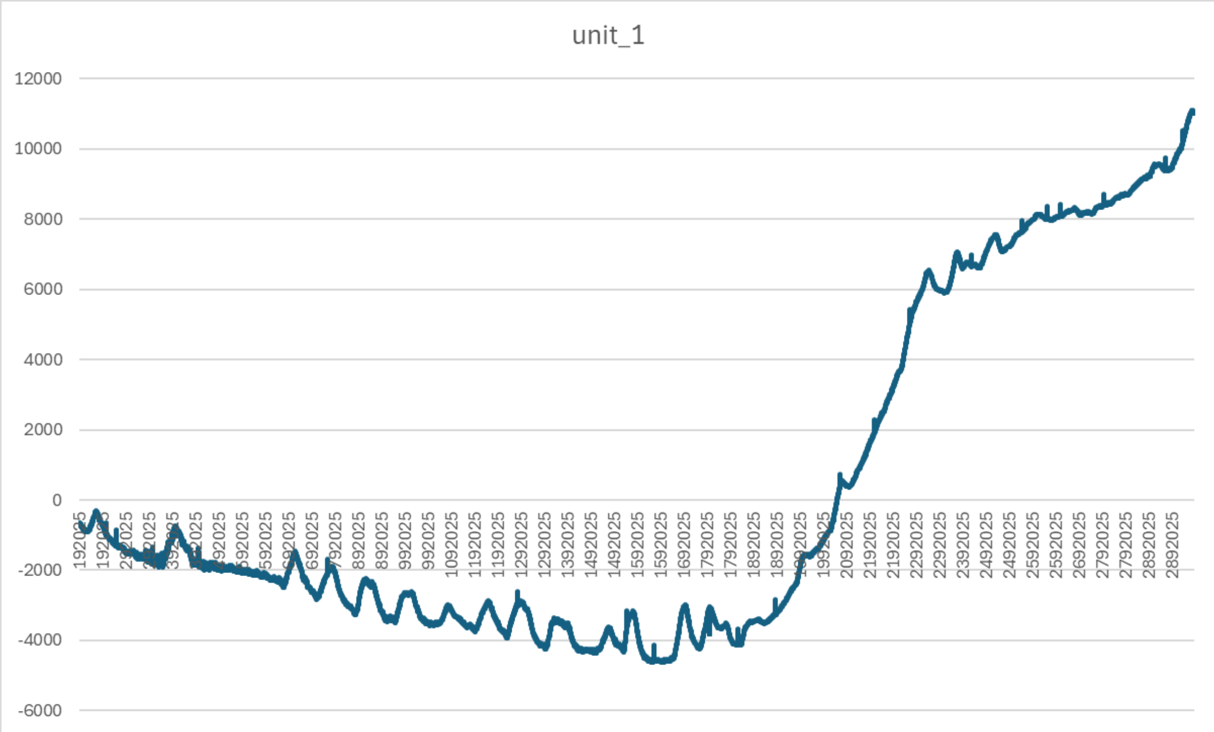
We see the values of unit 1 and unit 3 fluctuate around a value of approximately 1280000 and 1060000 resp. The values of unit 2 decline and reach the bottom with 20. September.

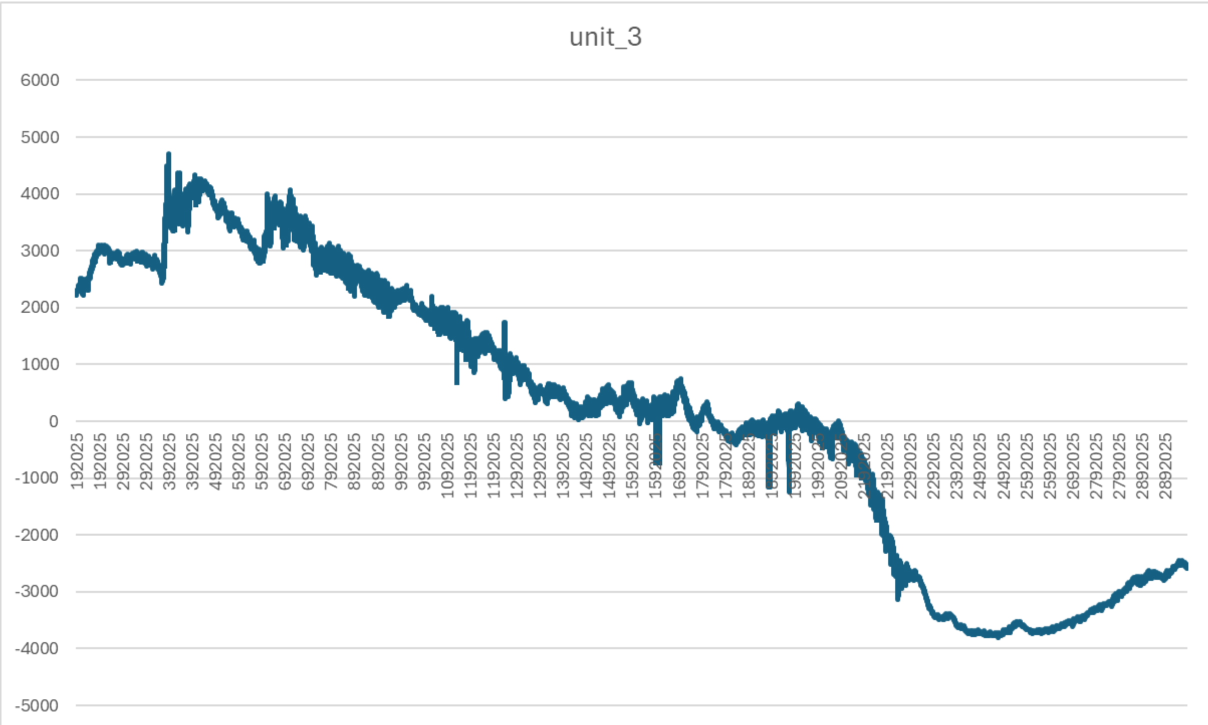
We work with unit_1 and unit_3 and calculate the differences from the average.





We have a lot of spikes we want to remove. The next two graphs show the cutoff of all values altering more than 1000 units.

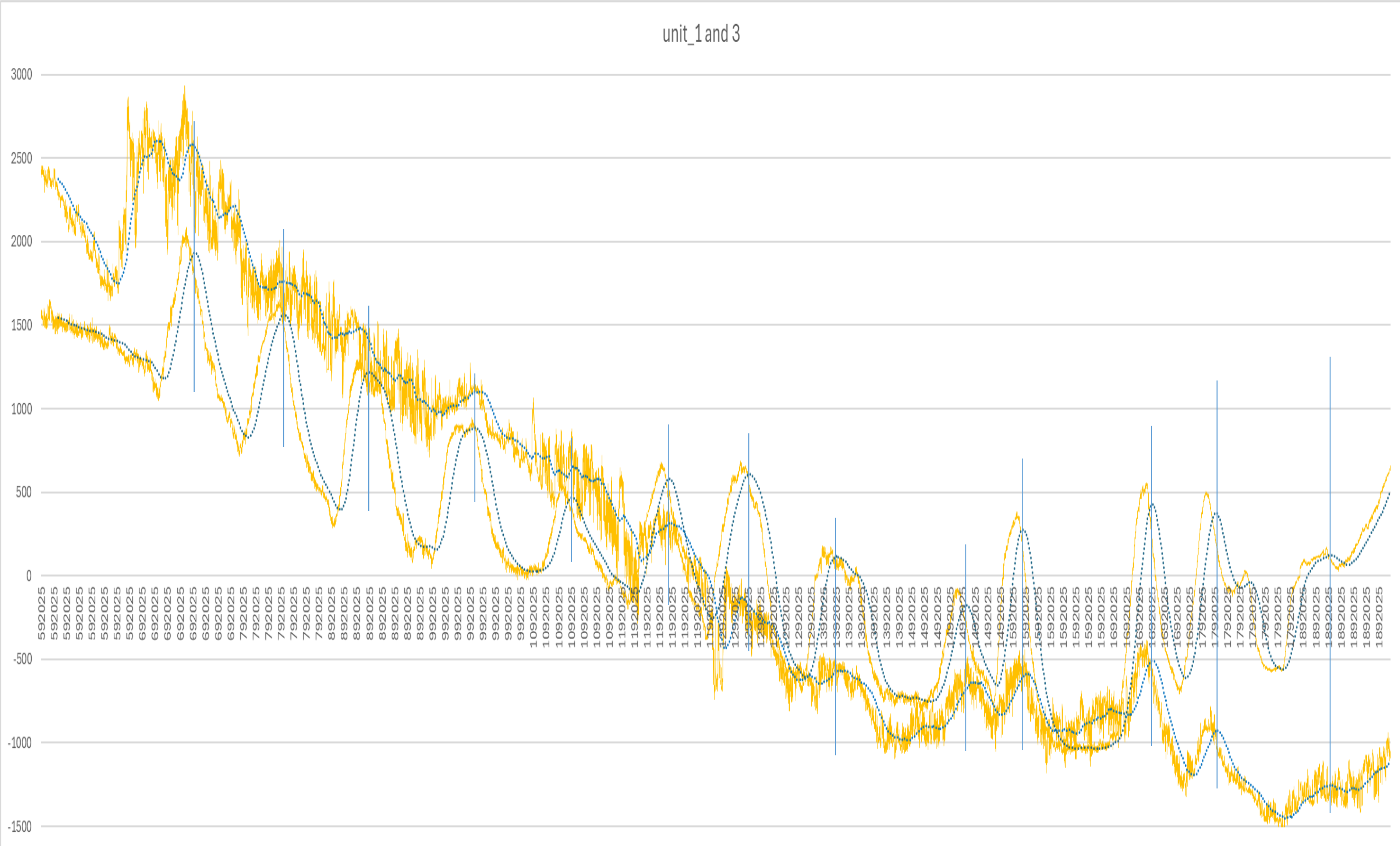




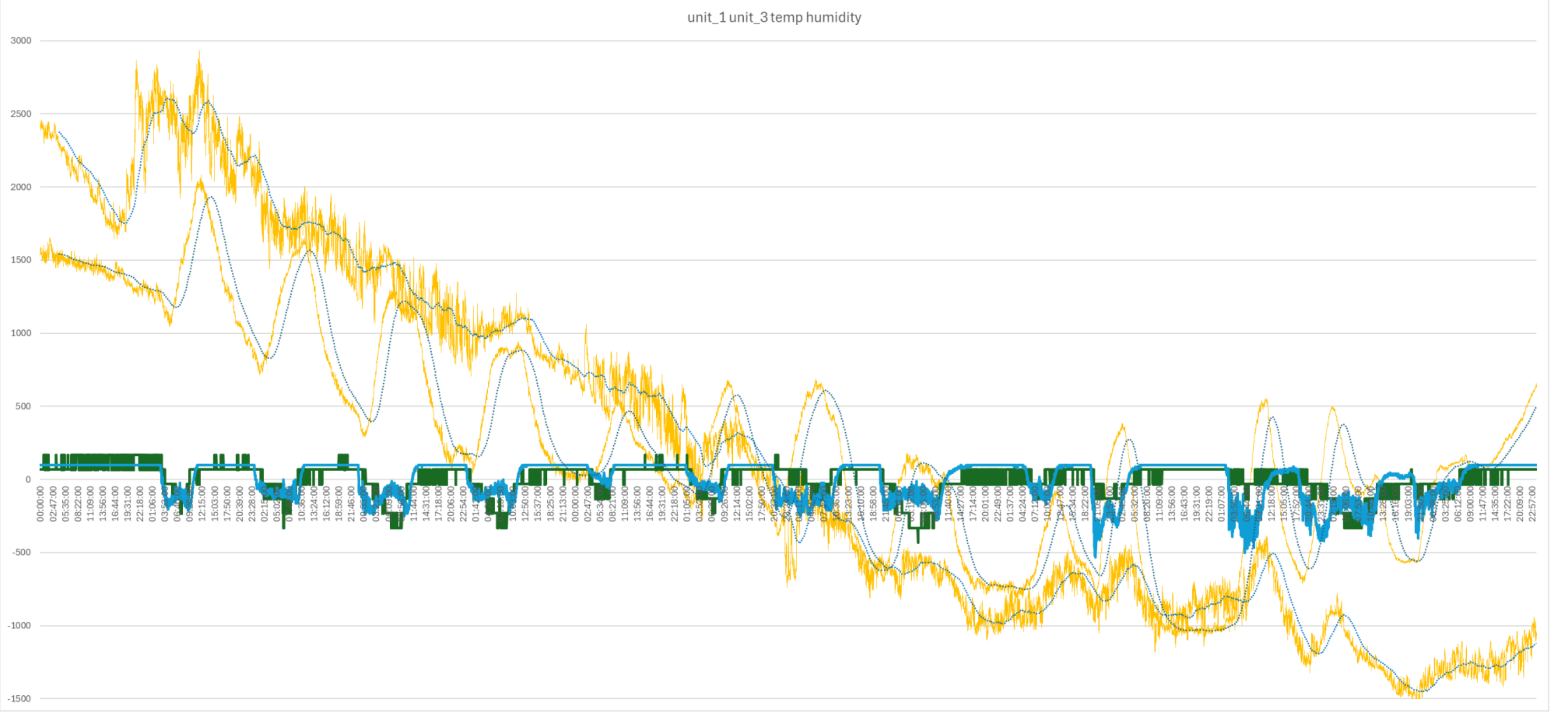
Both units show opposite behavior from first of September to about fifth of September and from 18th September on till the end of month.

We cut out the timespan from 5th Of September to 18th of September where we find a descending graph, unit 1 showing some periodicities.

We plot all data into one diagram, referencing unit 3 with unit 1.



We add the two curves for temperature and humidity to the diagram.

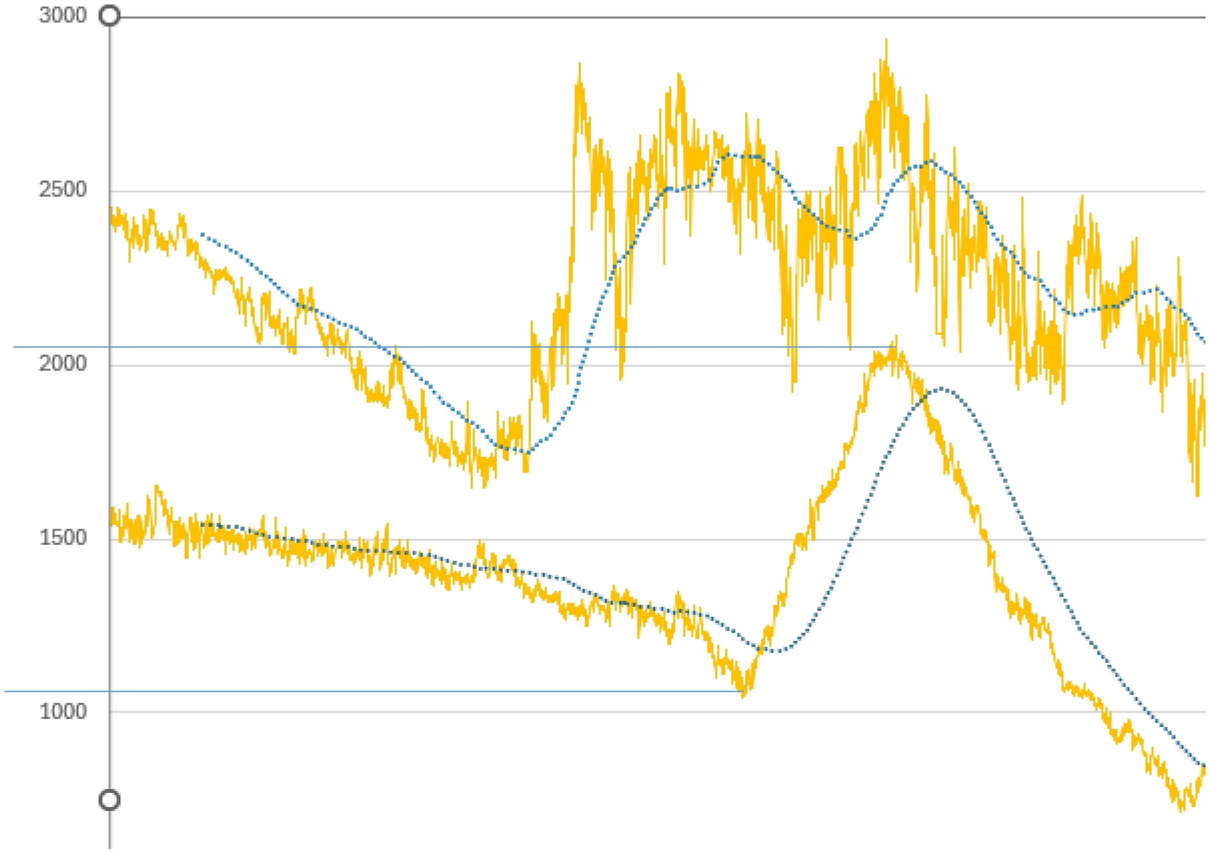


This shows that the maxima of the force measurements coincide with the changes in temperature (green) and humidity (blue). Falling temperature and humidity indicate a condensation process. The stone slab absorbs condensed water, thereby becoming heavier. As the temperature rises, the humidity increases, the condensed water evaporates, and the stone slab becomes lighter again.

Please note that the “delay” of the blue floating average line is caused by the floating average calculation.

This process seems to happen more or less regularly over the nighttime and seems to be an external, atmospheric process.

We can estimate the amount of water working:

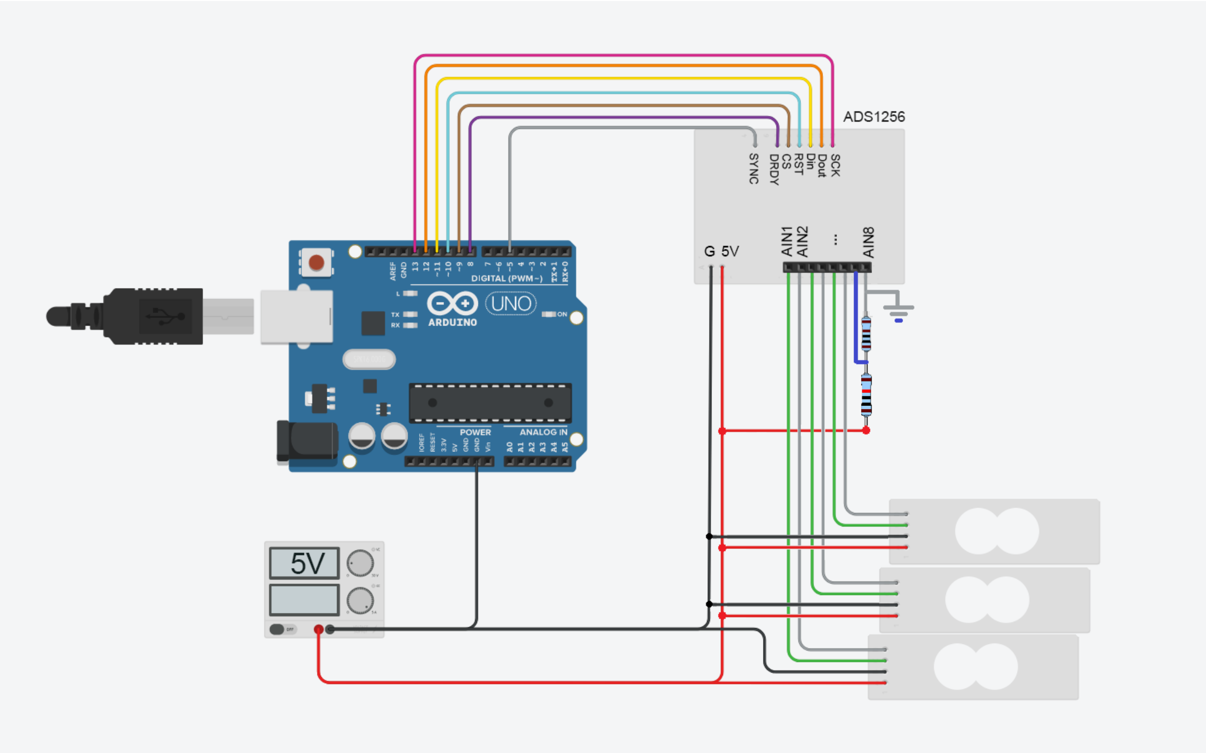


The difference in force is about $1{,}000$ units or $1{,}000 \cdot 10^{-7} = 10^{-4} N$ corresponding to the mass of $10\ mg$ of water.

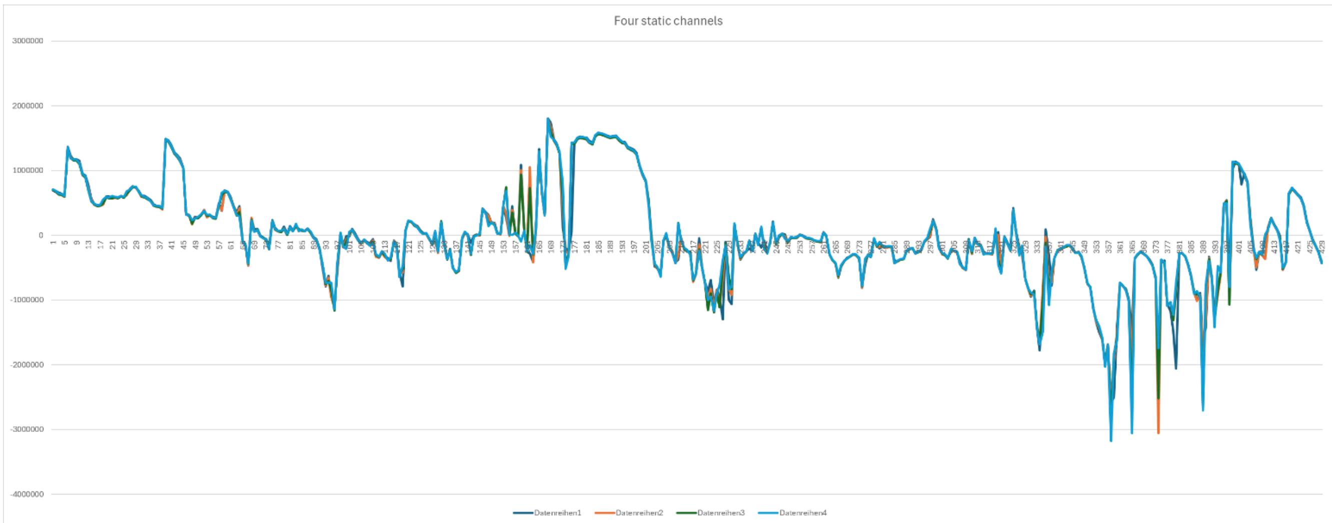
What we learn from this first month is that we must stop the condensing process. We will wait until the end of October and then construct an airtight (more or less) enclosure.

In a second step we replace the three HX711 with a single ads1256. This unit has four differential input channels so we can get the data of the three weight bars. In addition, we measure the input voltage of the weight bars because we have a dependency not only of humidity with measuring results but as well as of the measured voltage with the supply voltage of the Wheatstone bridges.

The wiring diagram:

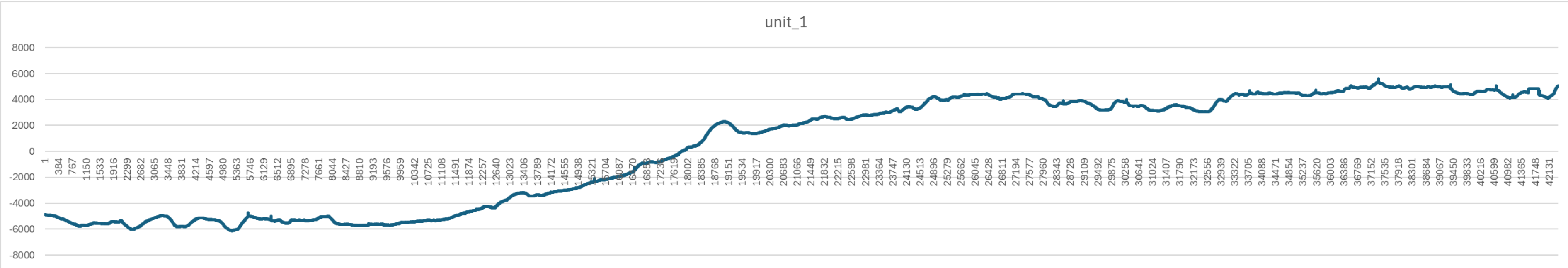


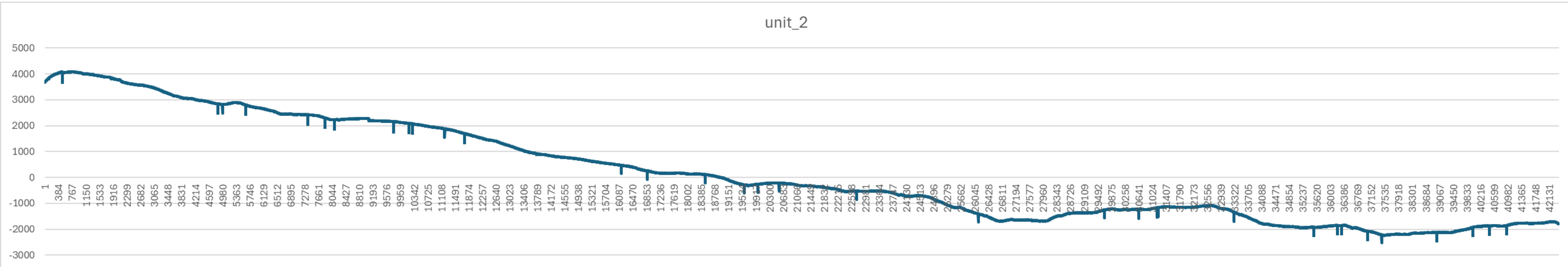
The first test reveals that the ads1256 is more stable than the HX711. A measuring sequence of the three inputs of about 400 samples gives the following picture, again relative to the average:

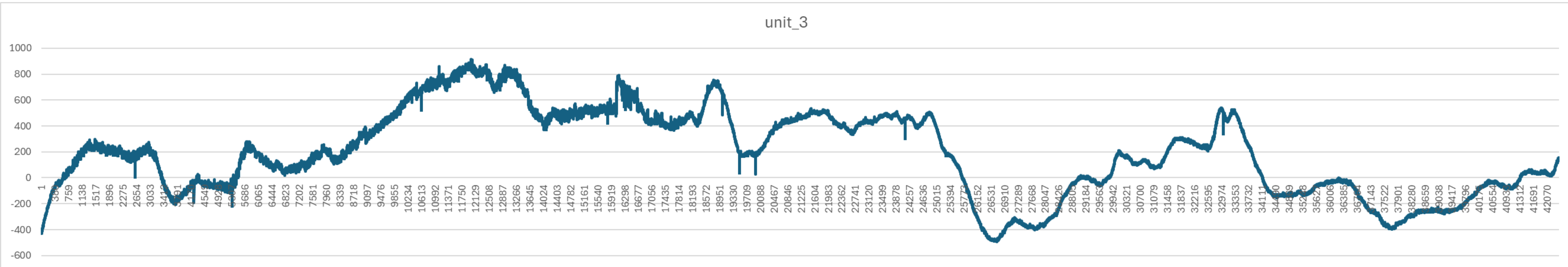


The four graphs lie close together, we have no spurious spikes.

The raw data of October 2025





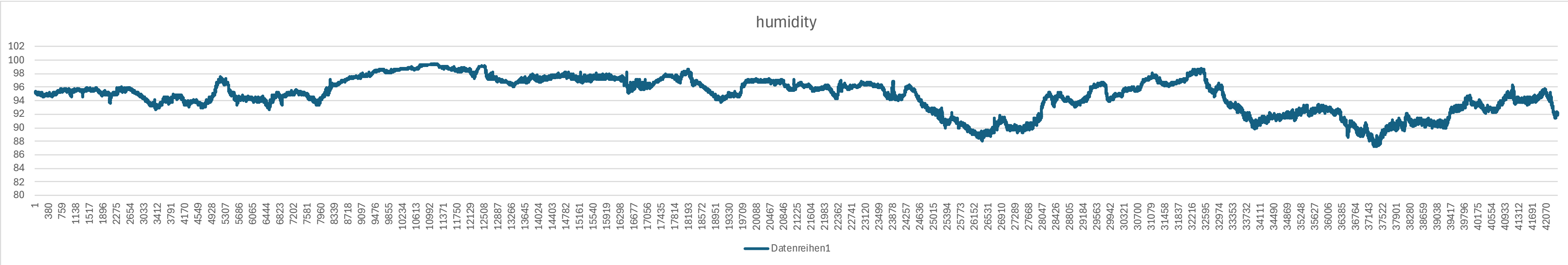


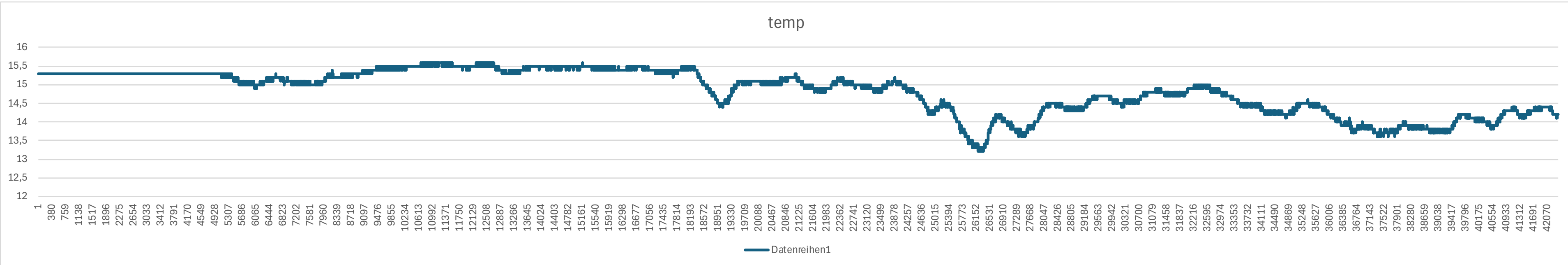
Again we see minor similarities between the shape of unit two and unit three, caused by temperature or humidity.

We replaced the measuring bar of unit three with a new weight bar as well as a new HX711. Checking unit three, we found that the weight bar failed, the Wheatstone bridge became corrupt by the high (condensing) relative humidity. The new unit shows a mor stable behavior, the swing over one month is between -400 and 800 units in contrast to the swing of unit one and two with a swing between -6000 and 6000 units.

We will not investigate this problem as we replaced the combination of three HX711 by a single ADS1256 for future measurements, but a few examinations of the data curves will be allowed.

Temperature and humidity





Note: Temperature is shown in °C, relative humidity in percent.

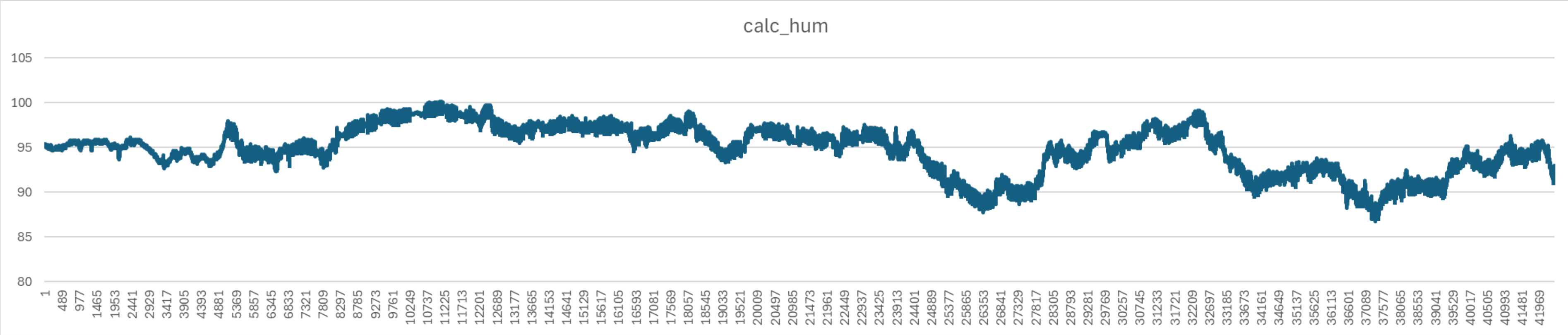
There is a dependency between temperature and humidity. More information you may find at https://sensirion.com/media/documents/FC5BED84/662B494D/Sensirion_Humidity_Temperature_Design_Guide.pdf

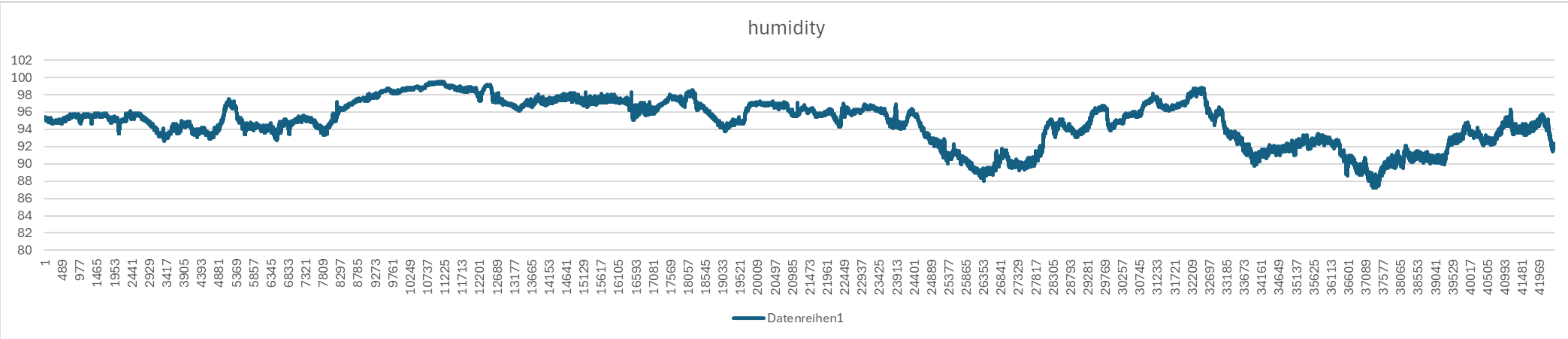
At constant absolute humidity, two states with different temperatures and relative humidity are related. If the absolute amount of water in the air is constant, the change of temperature leads to a new reading of relative humidity:

$$RH_2 = RH_1 exp\left(mT_n \frac{T_1 - T_2}{(T_n + T_1)(T_n + T_2)}\right)$$

$RH_{1,2}$ *relative himidity at state* 1,2, $T_{1,2}$ *temperature* °*C at state* 1,2, $m = 17{,}62$, $T_n = 243.21°C$

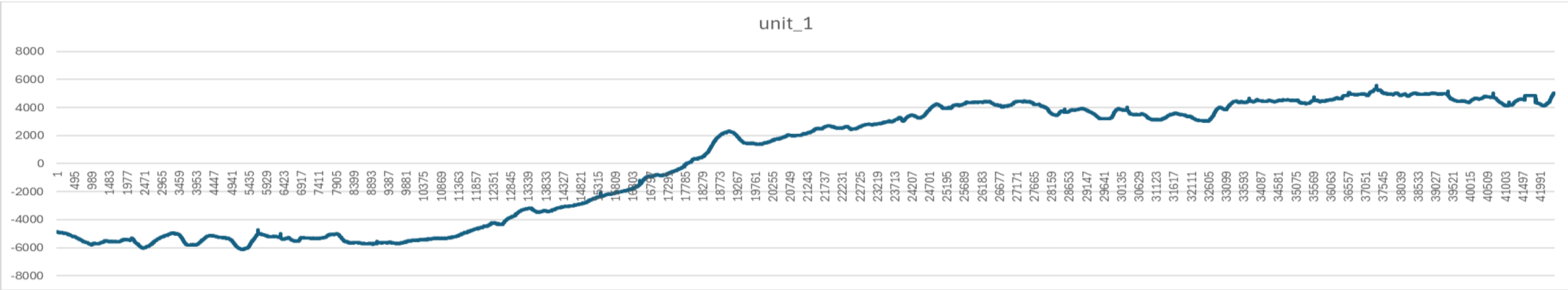
We use this formula to compare the actual change in humidity with the calculated change in humidity depending only on the change of temperature.

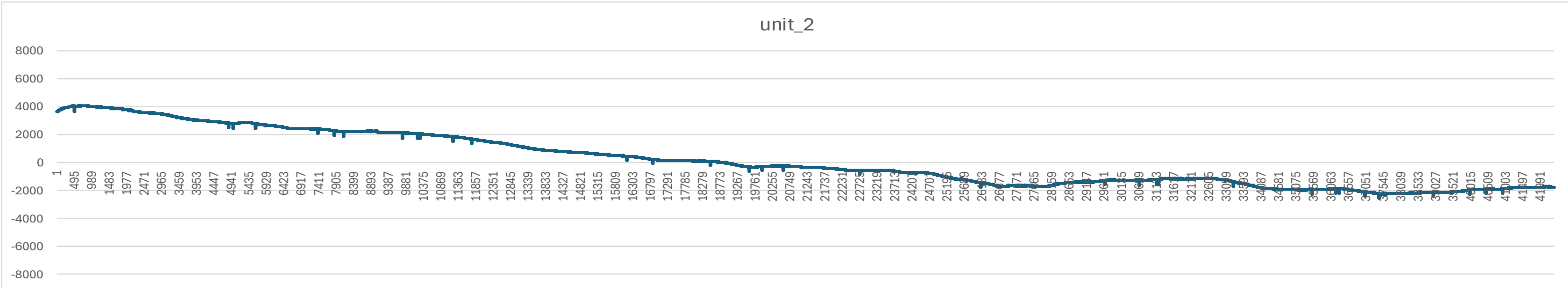


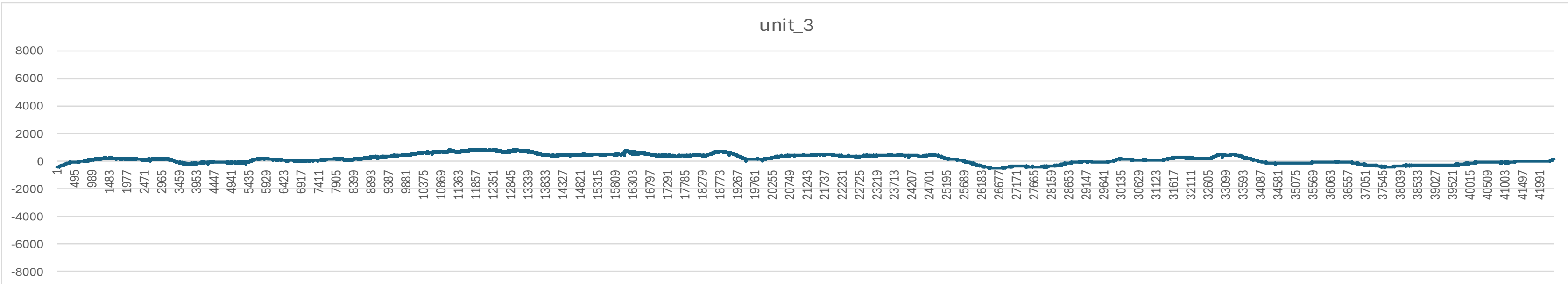


Both graphs match. The changes in relative humidity are caused by changes in temperature.

We compare the graphs of the three measuring units, scaling the graphs to the same values.



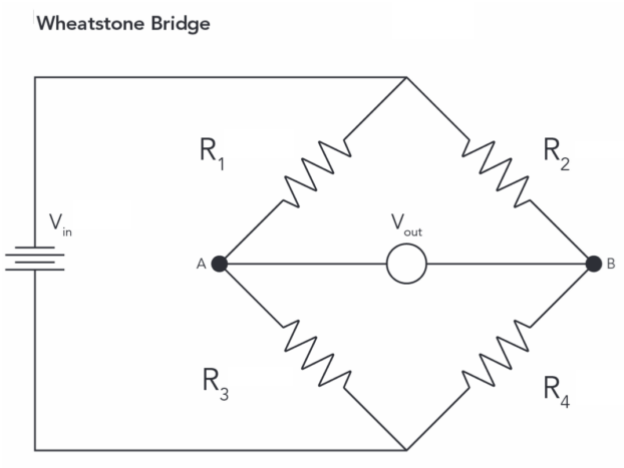




There is no easy interpretation of the values. We remember that we have changes in average of 10^{-3} for unit_1 and unit_2 and 10^{-4} for unit_3.

Unit_1 shows a rising graph in contrast to unit_2 with a falling graph of same size. Unit_3 is a more or less straight line. We will have to wait until the data of November is available.

With beginning of November 2025 we measure the voltage across the weight bar, a Wheatstone bridge. Changes in the bridge excitation voltage will change the bridge output voltage. With this information we can correct the deviation the measuring voltage has due to the change in the bridge excitation voltage.



We calculate the measuring voltage between the points A and B:

$$V_{out} = V_{in}\left(\frac{R_1}{R_1 + R_3} - \frac{R_2}{R_2 + R_4}\right)$$

We need the change of output voltage caused by the change of input voltage under the assumption that the bridge remains unchanged:

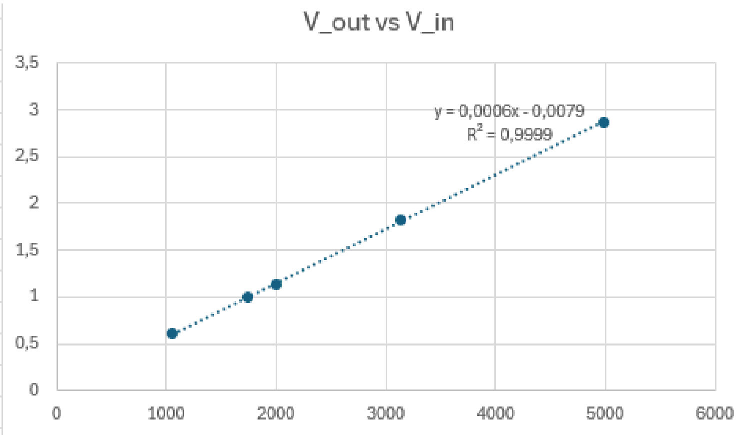
$$\left(\frac{R_1}{R_1 + R_3} - \frac{R_2}{R_2 + R_4}\right) := \rho = const.$$

$$V_{out1} = V_{in1} \cdot \rho + c$$

Note: ρ will depend on the individual Wheatstone bridge, c is an offset depending on the individual values of the resistors.

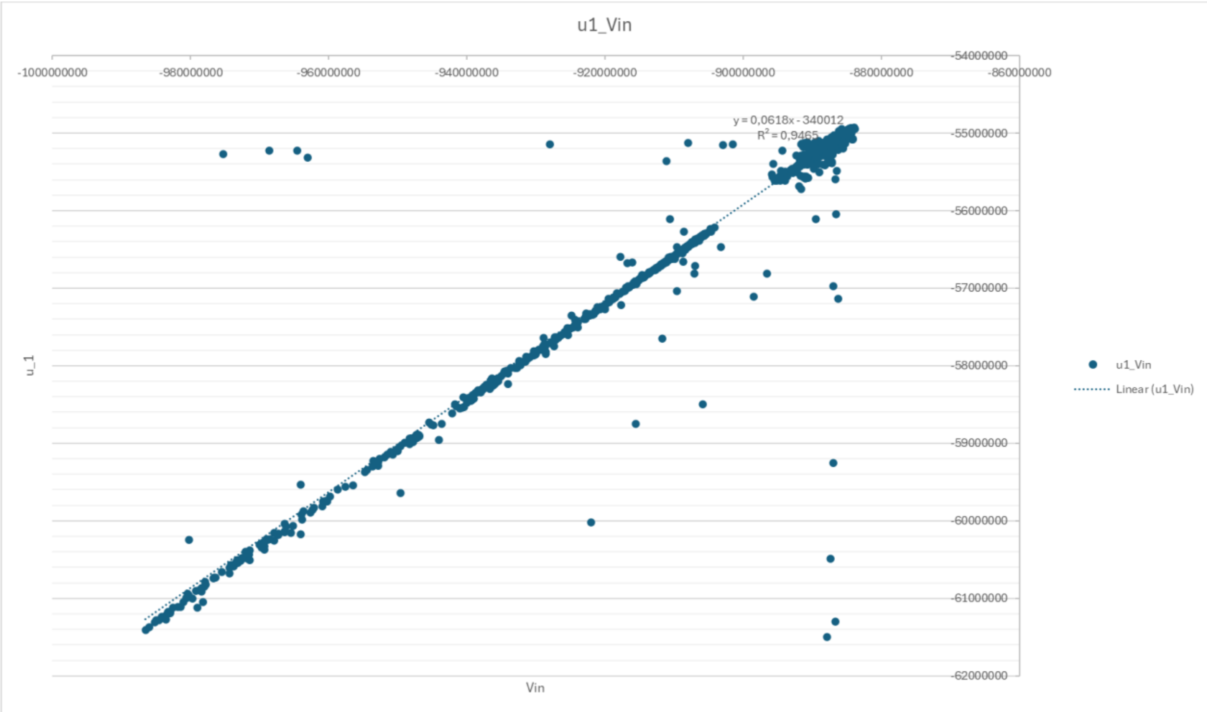
We check the value of ρ by a spare bridge with a load of one kilogram (V_out, V_in in mV).

mass 1 kg		
V_in	V_out	V_out_calc_lin
1058,5	0,61	0,603853555
1744,4	1	1,000284254
1995	1,13	1,145123929
3142	1,82	1,808057317
4984	2,87	2,872680945
a	b	
0,00057797	-0,00792935	
y=a*x+b		



Perfect.

We do the same for actual (partial) data from November.



The change in the slope factor from 0.6 in the sample with the spare bridge to 0.06 in the actual measuring unit is caused by a voltage divider we used not to overload the AD converter.

What we learn from this graph is that the input voltage is not constant. We have the following swing (absolute values only):

item	max	min	swing absolute	swing relative
u_1	61500725	54926542	6574183	0,106896024
u_2	57858113	51746323	6111790	0,105634105
u_3	67305603	60206655	7098948	0,105473359
V_in	986482939	883831175	102651764	0,104058327
$temp$	14	15,5	1,5	0,107142857
hum	52	52,8	0,8	0,015384615

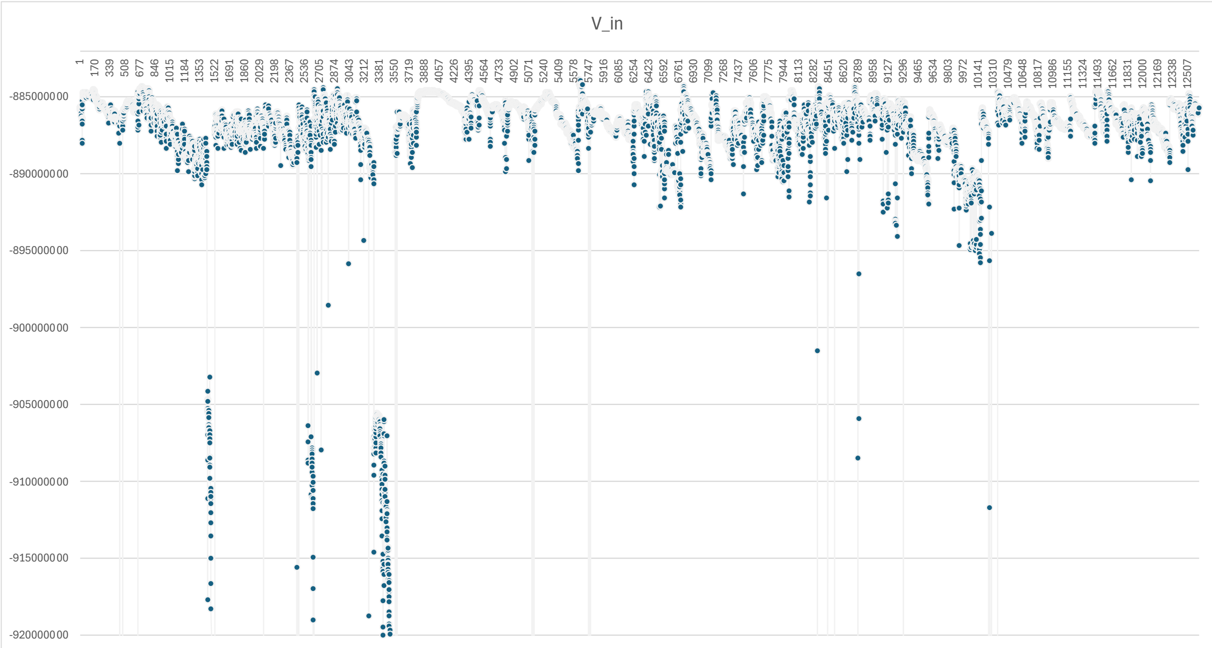
Note: With 256 times oversampling we have 32-bit values.

We interpret the scatter plot:

- Most of the measured values follow a linear dependency.
- We have a gap.

The gap occurs between the input voltages absolute values 904106364 and 895780074 in the region of the minimum voltage.

We take a closer look at this region:



In the area between $-9.0E8$ and $-8.9E8$ we have only sporadic values.

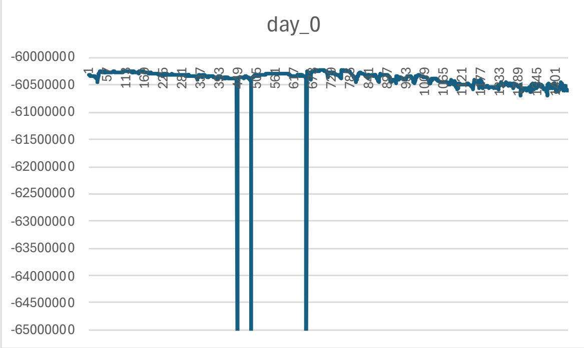
The voltage supply of the analog input of the ads 1256 seems to be not stable and jumps, causing either changes in the Wheatstone bridge or implicit impacts the analog to digital conversion.

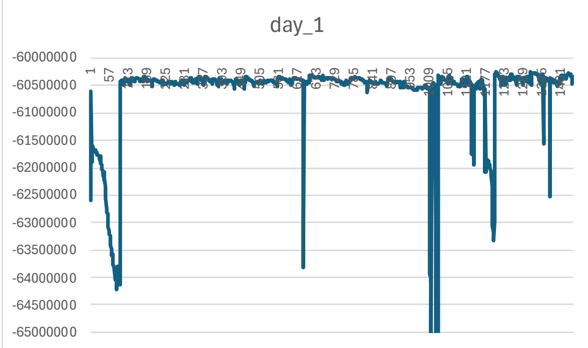
For the next measuring sequence in December, we will work on this topic.

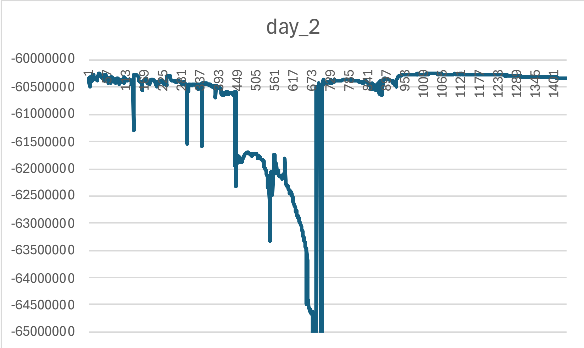
The raw data of November 2025

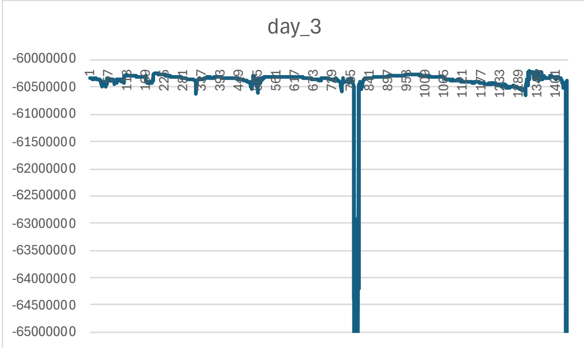
We still have problems with the acquisition of data due to a lot of noise in the measurement.

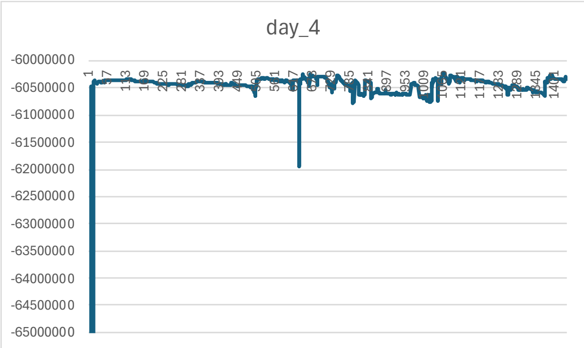
We look at the data from day to day, using the ratio of unit_3 divided by the supply voltage of the Wheatstone bridge.

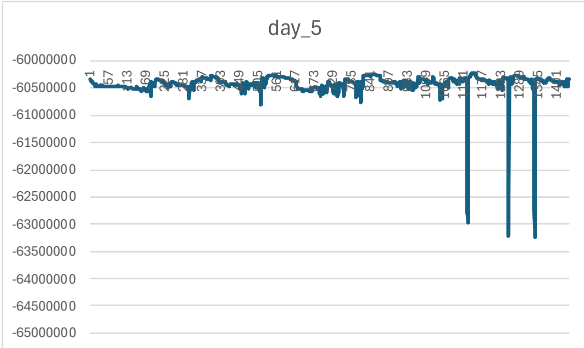


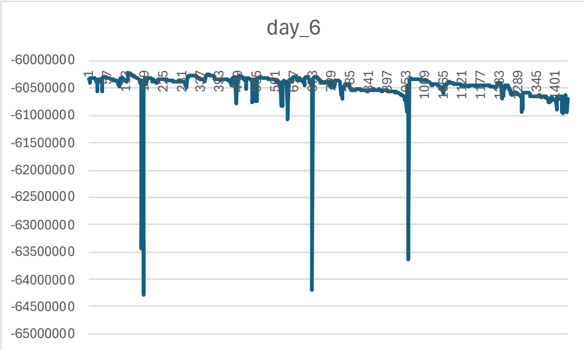


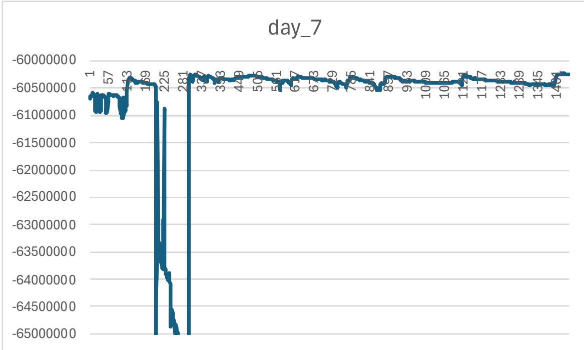


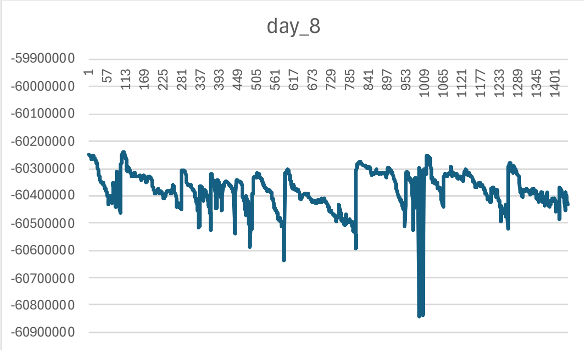








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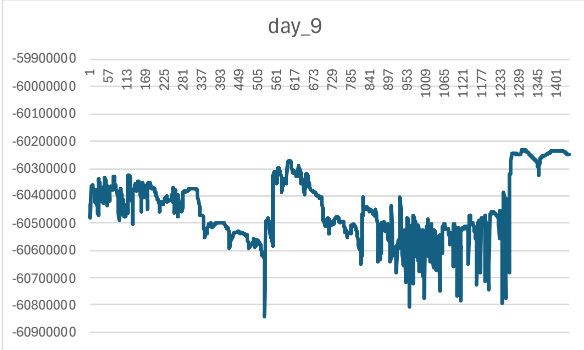
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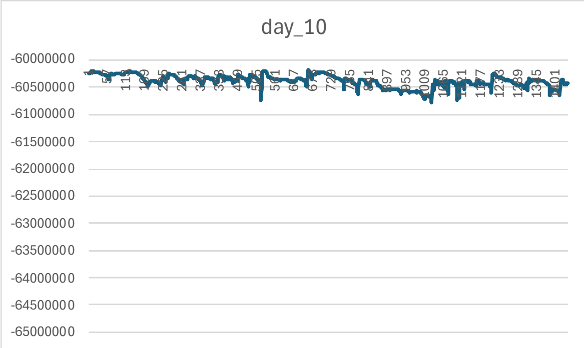
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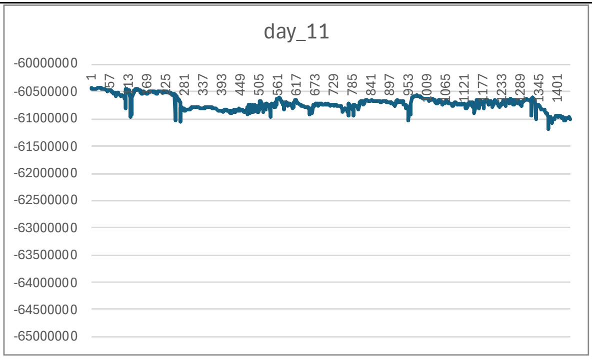
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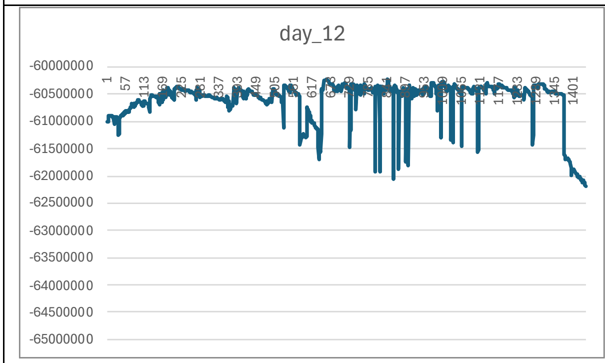
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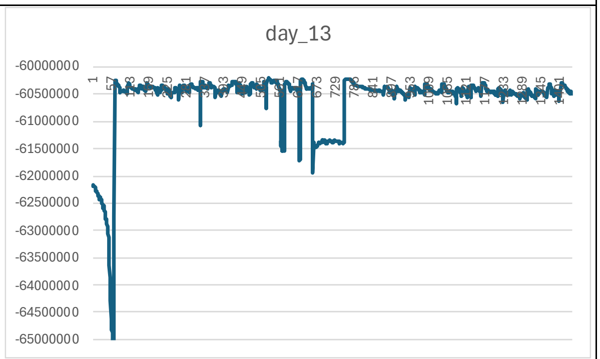
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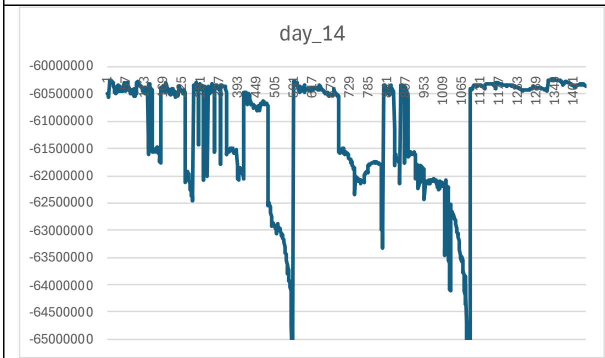
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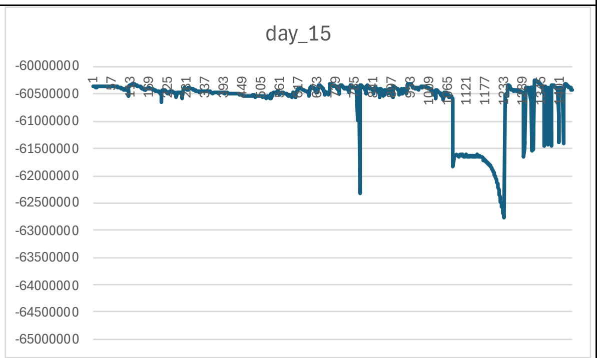
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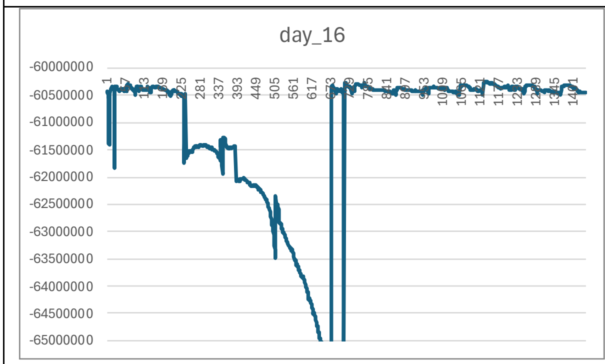
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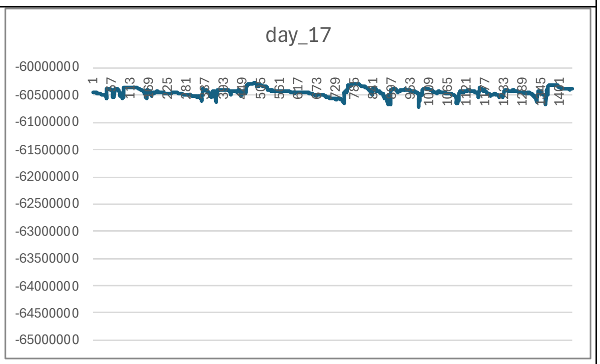
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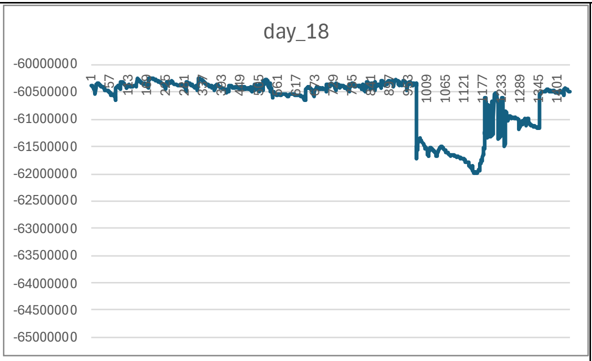
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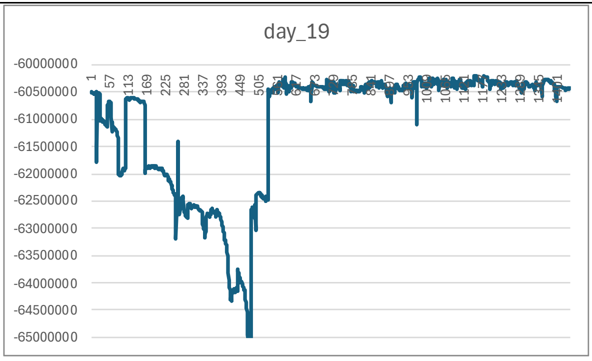
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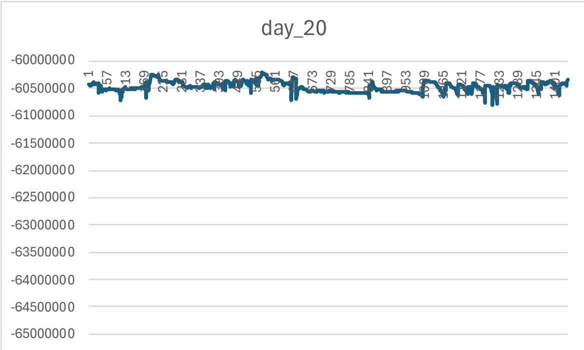
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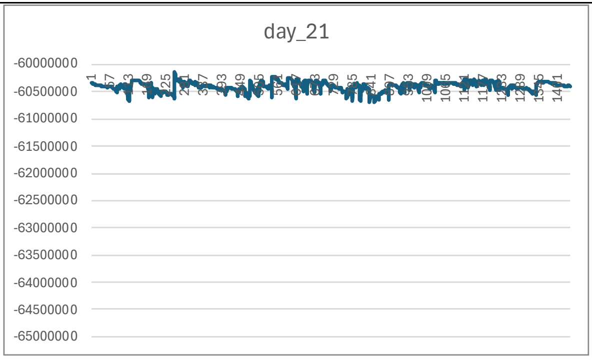
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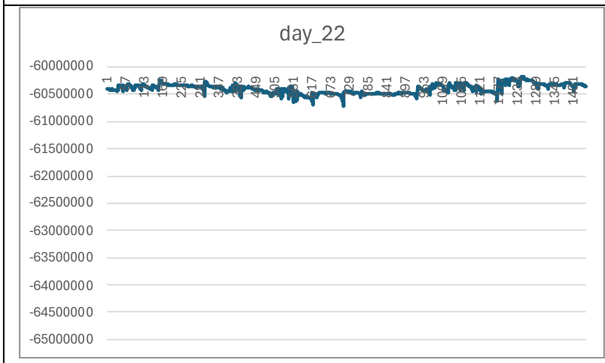
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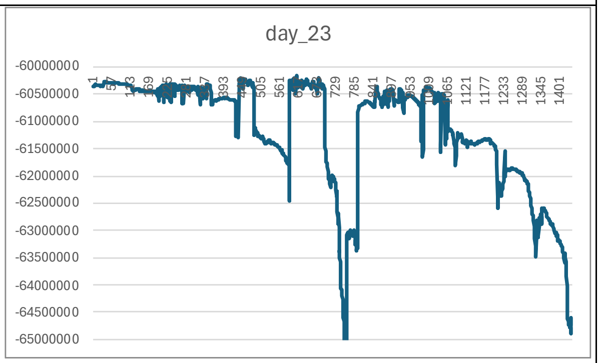
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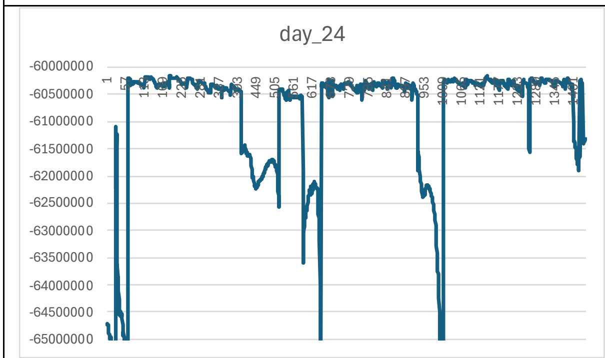
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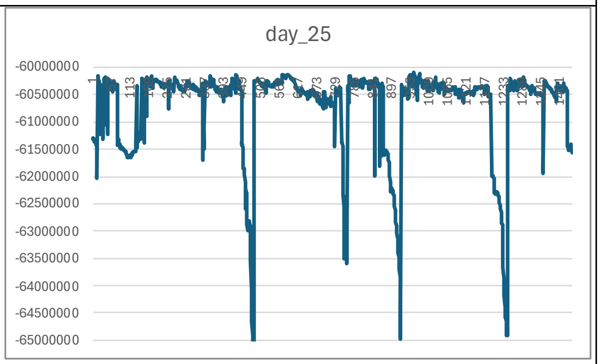
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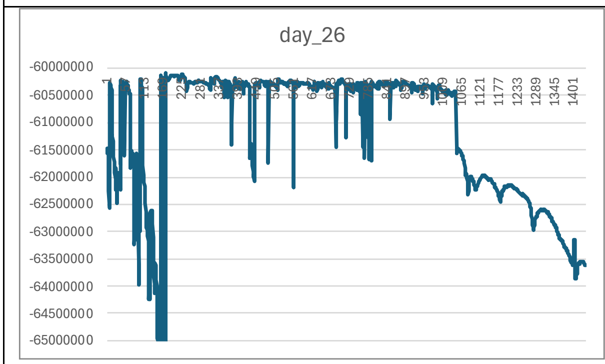
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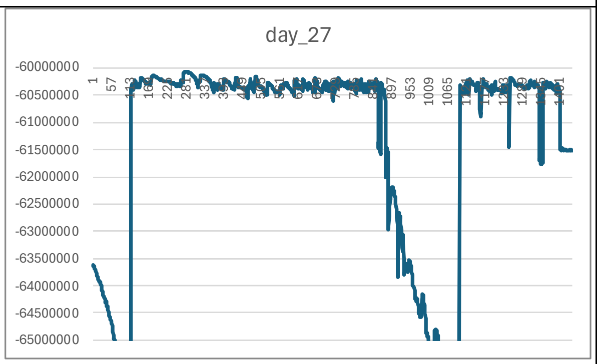
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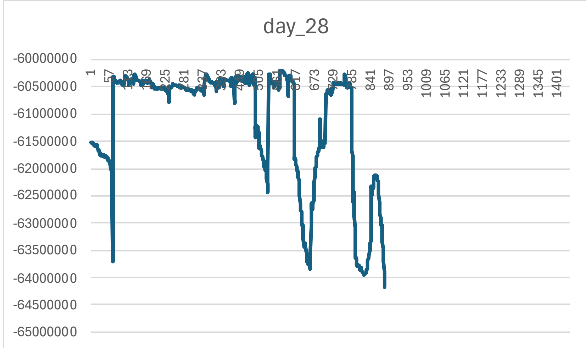
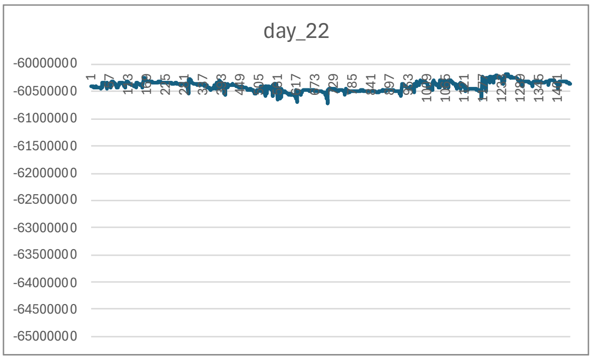
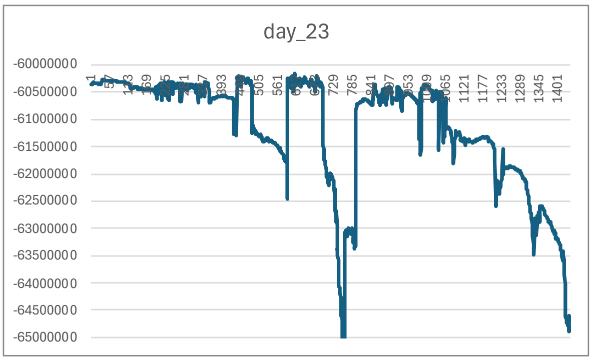


The results of the measurements are not satisfactory.

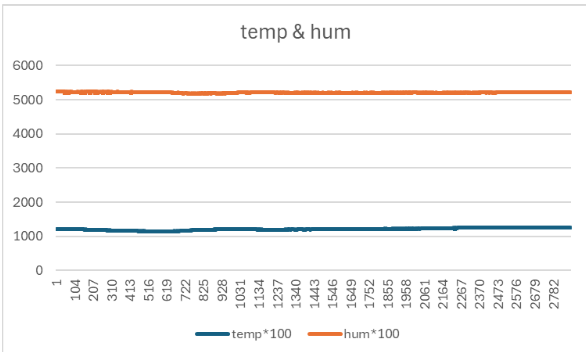
Day 22 delivers what we expected, a straight line with some noise in the range of 1%:



Day 23 seems to be out of order with a deviation of 10%:



The deviation of temperature within these two days was 3%, the deviation of humidity 4‰



The Todo for the December measurements: Separate the supply voltage for the ads 1256 with a precision voltage regulator, e.g. the LT3045 from Analog Devices.

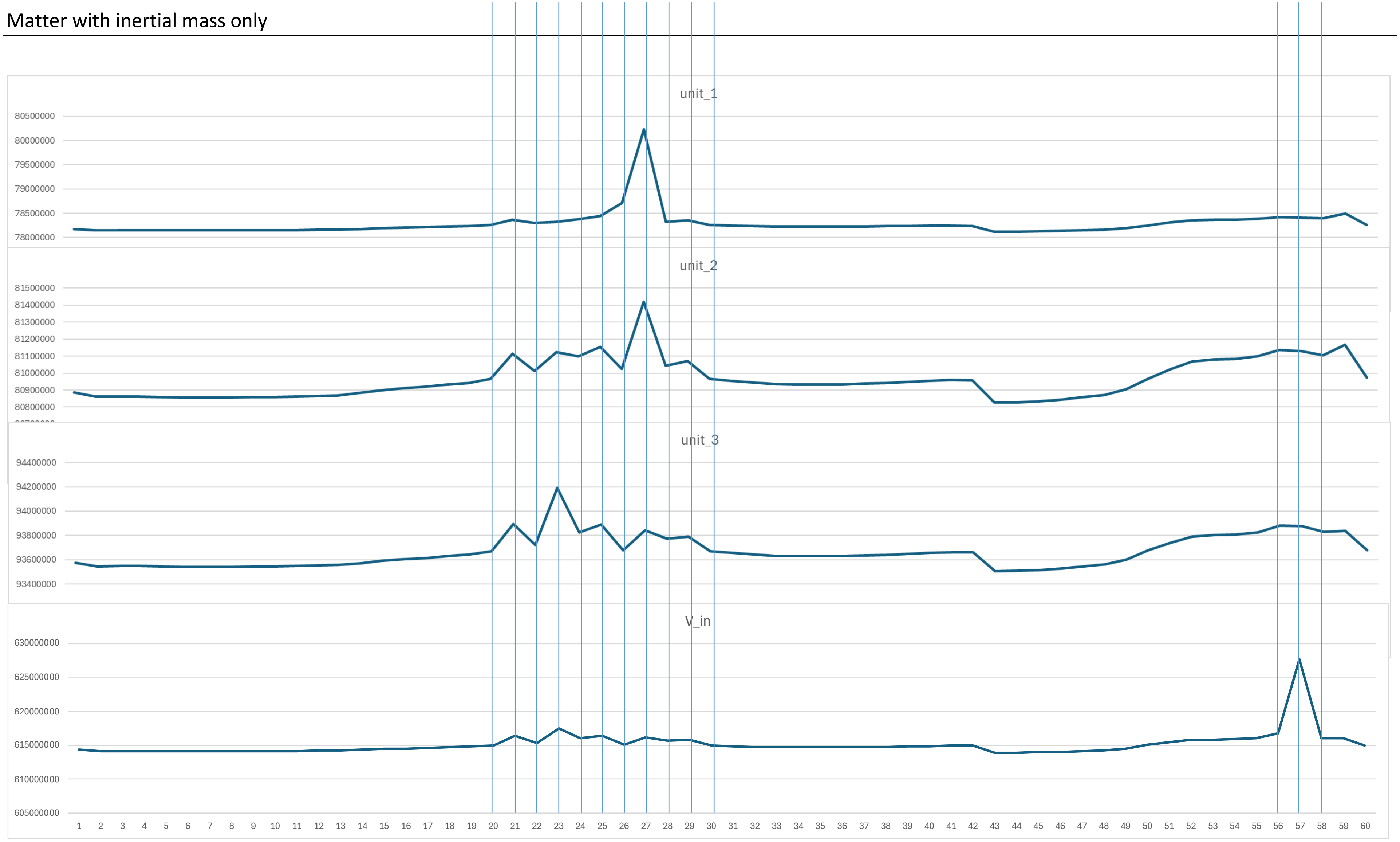
The raw data of December 2025

The raw data for December is useful only for the first 10 days. Reason for this is a technical mistake. To reduce noise, I implemented a magnetic inductor. The voltage after the inductor was around 6 volts. This input voltage is enough for the inbuilt voltage regulator of the Arduino to supply the 5 volts. After twelve days the input voltage dropped below 5.5 volt and led to a malfunction of the Arduino – no reliable data was acquired.
This gives time to check the dependency of the results of the A/D converter and the input voltage of the Wheatstone bridges.

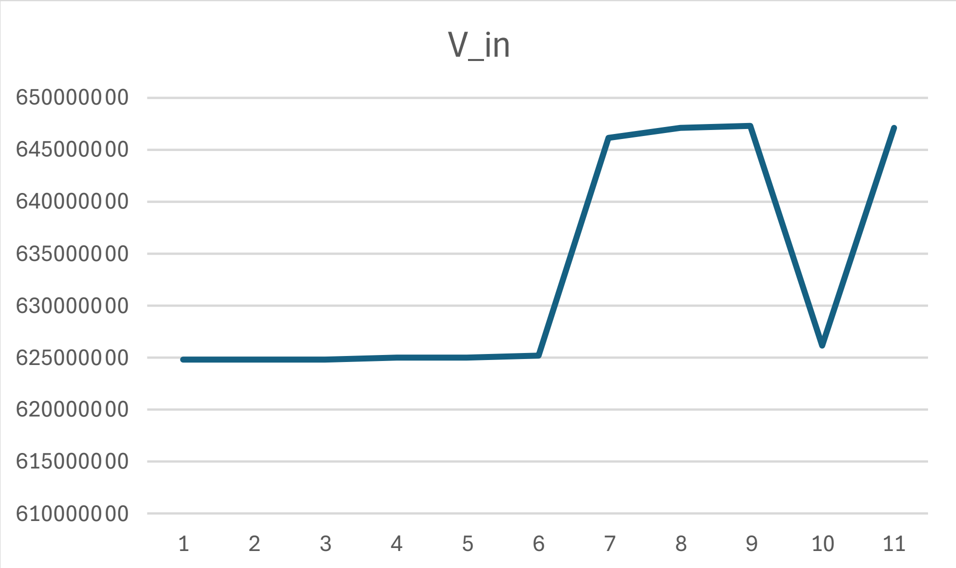
We choose the data from the third of December, the first hour after midnight from 00:00 to 59.00.

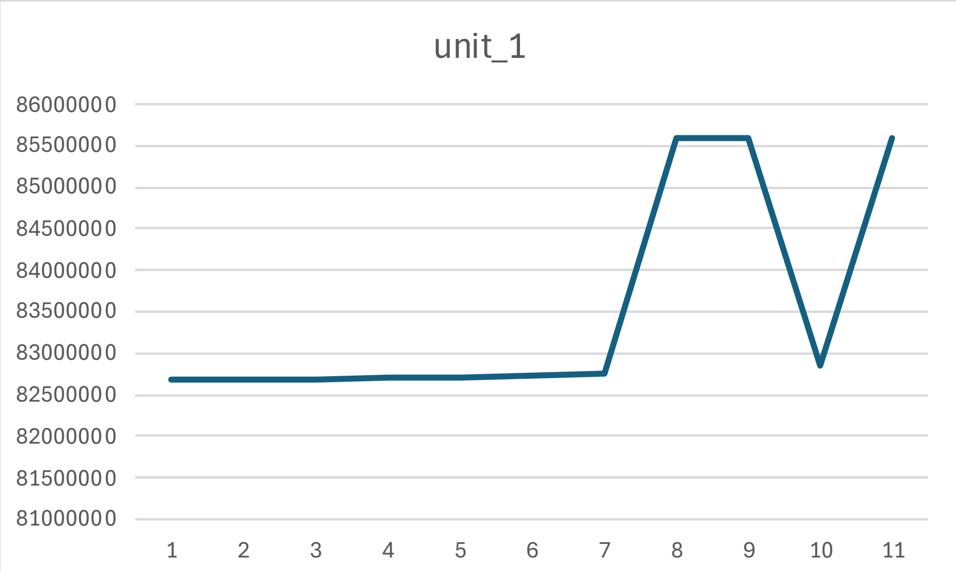
Strange things are happening.
From minute 20 to 21 we had a moderate rise in the supply voltage of the Wheatstone bridge, V_in.
The measuring units one to three respond with a raise, unit three and unit two with the same extend, unit one with a lower extend.
From minute 22 to 23 we had a moderate raise in V_in. Unit one responds with a very little raise, unit two with a moderate raise and unit three with a big raise.
This behavior, different reactions to the change in V_in continues. An extreme example we find from minute 56 to 57 where V_in shows a big peak while the three units remained constant or lowered.

Reason might be the long conversion time. As we do a 256-times oversampling, the conversion time for one unit is about 10 seconds. The order of conversion is $unit\_1, unit\_2, unit\_3, V\_in$.


unit_1
80500000
80000000
79500000
79000000
78500000
78000000
unit_2
81500000
81400000
81300000
81200000
81100000
81000000
80900000
80800000
unit_3
94400000
94200000
94000000
93800000
93600000
93400000
V_in
630000000
625000000
620000000
615000000
610000000
605000000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

Despite the efforts of reducing the noise in the supply voltage we have the same behavior in the data of January:





We interrupt collecting data and change the data acquisition from oversampling to single samples to get a better match between the samples of data and the samples of supply voltage.