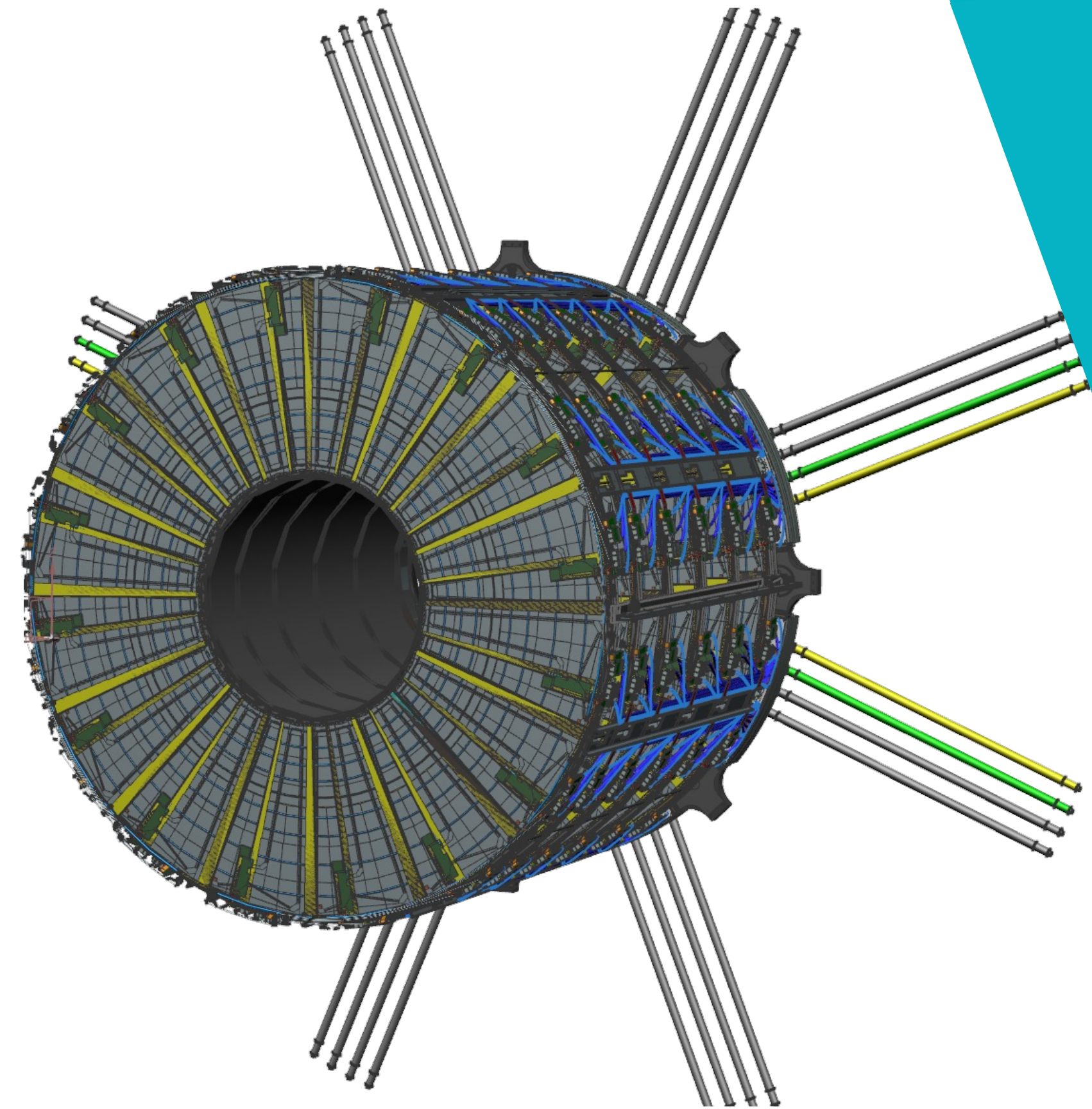




MEASUREMENTS

DISTANCE BETWEEN  
WHEEL RIM AND LOWER  
PETALS. END-CAP C



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ITK-EC mechanics/integration engineers phone meeting

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# SETUP: Petal + digital gauge

**Motivation:** Due to sensor cracking, one of the potential case scenarios is that the petals will get an extra layer of material, resulting in a larger petal thickness. This could be problematic if there is not enough space between the lower petals and the wheel rims in the already built EC structures (A and C). EC-A was already measured when the RF box issue was addressed, but EC-C needs to be checked.

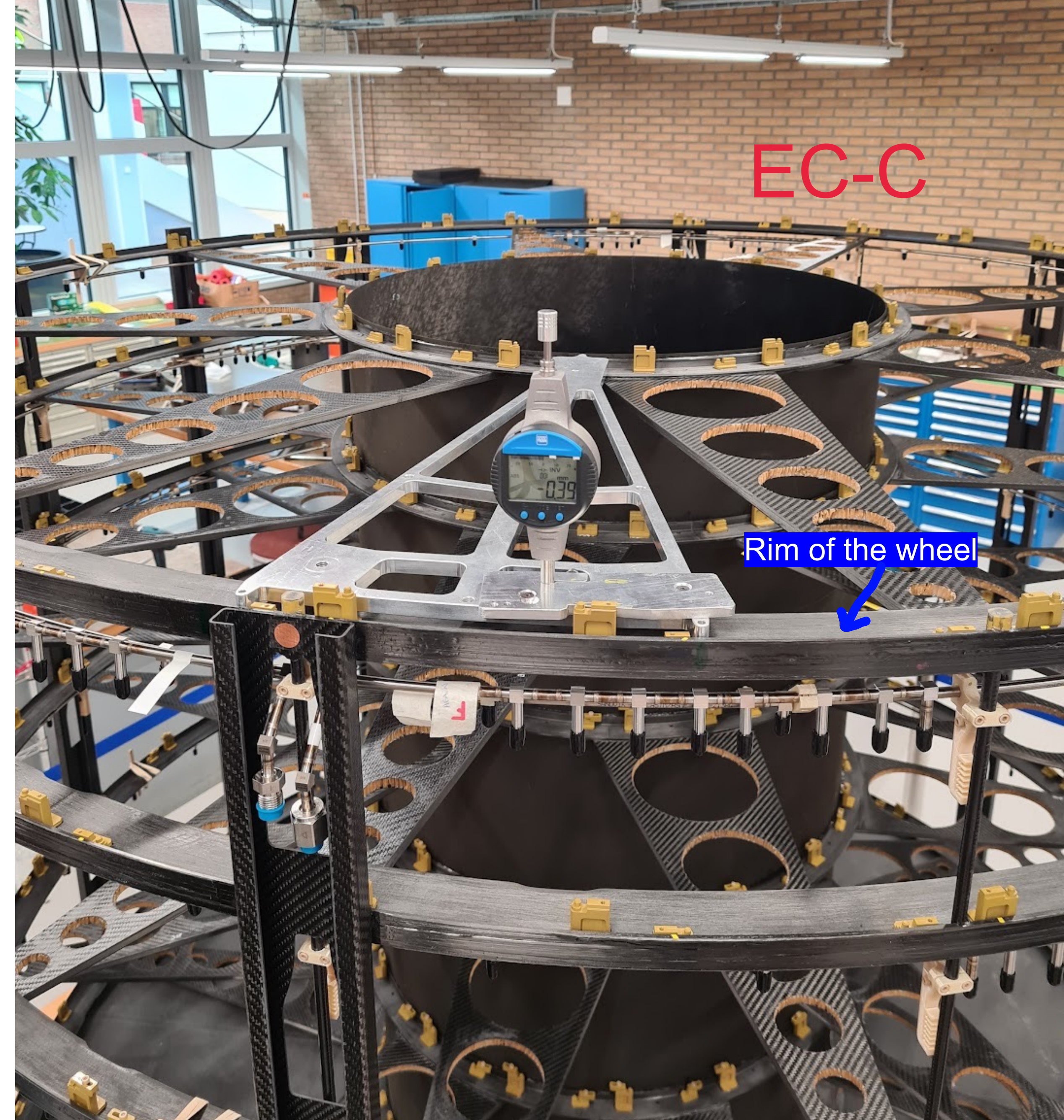
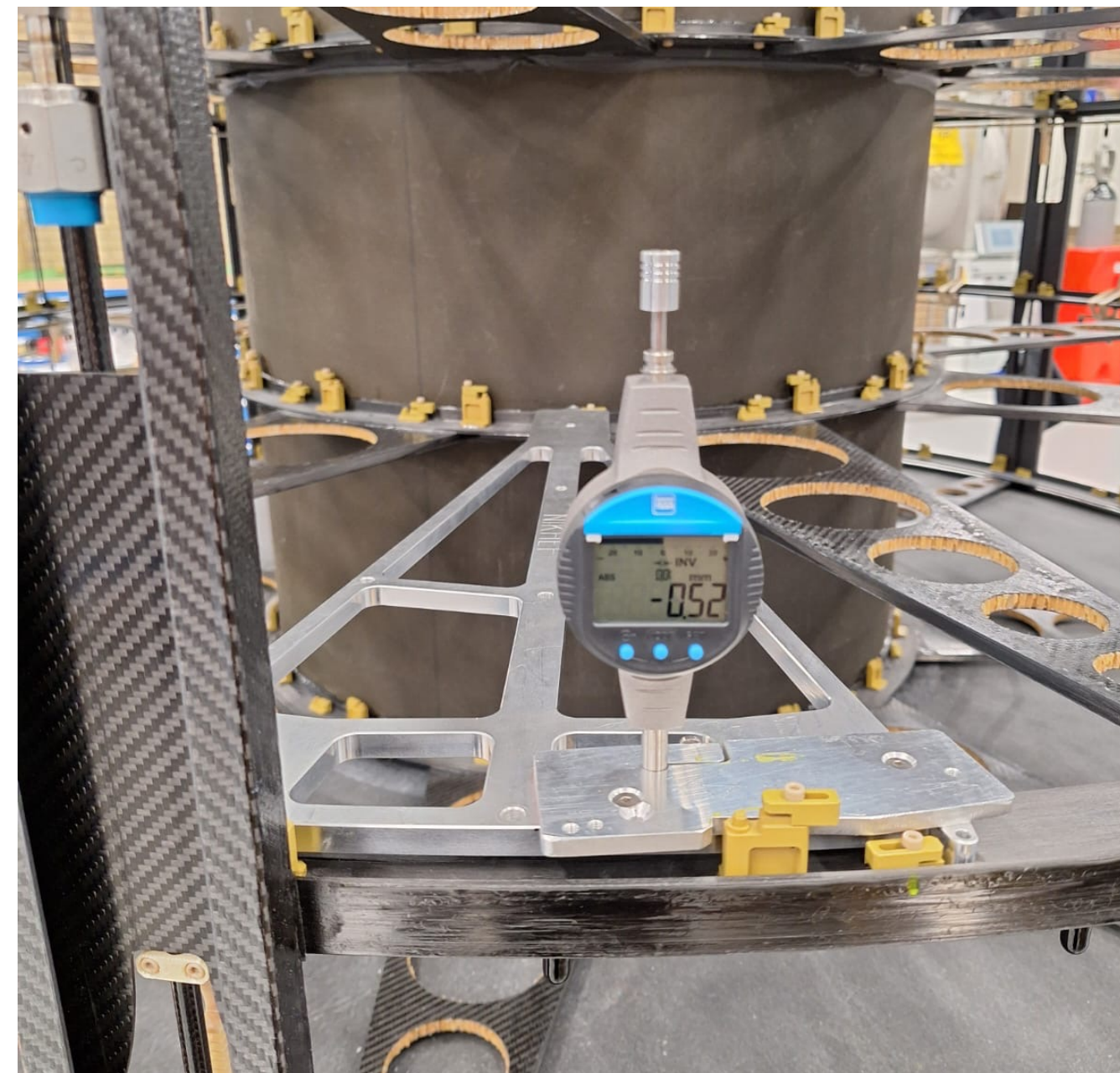
**Measurement:** Test petal is placed on low locking points. For this EC, we use a digital gauge with a needle touching the wheel rim.

**Nominal value: 0 mm.** This is the reference (0.0) respect to the 7mm-high low locking point (set by placing the petal on a custom plate with the nominal 7mm height).

< 0 = wheel rim and lower petal are closer than expected (bad)

> 0 = there is more space between them (good)

**Petal for this test:** old petal that was used for the pipe bending frame. Added a plate with the gauge. The position for the height test is determined by the latest petal model.

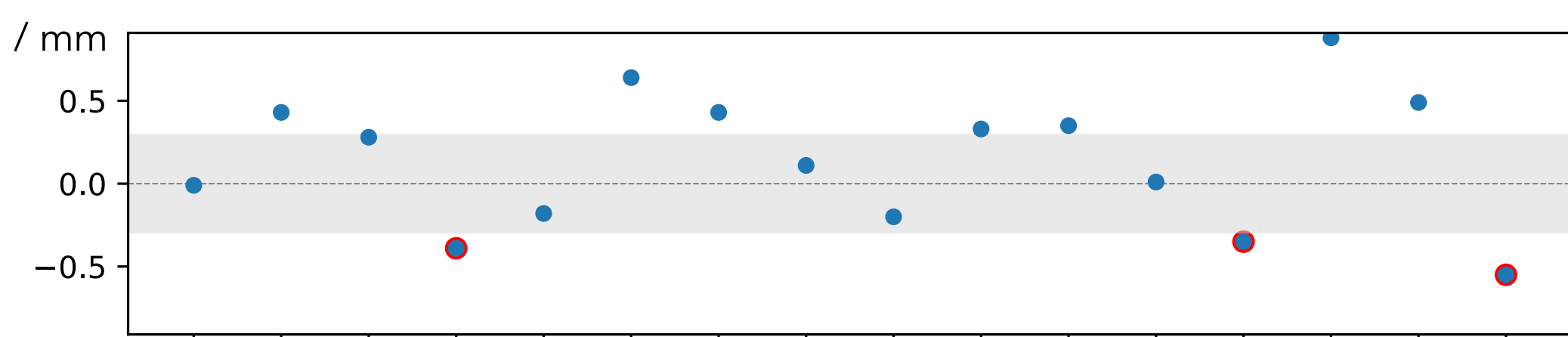


# EC-C. Measured distance between lower petals and wheel rim

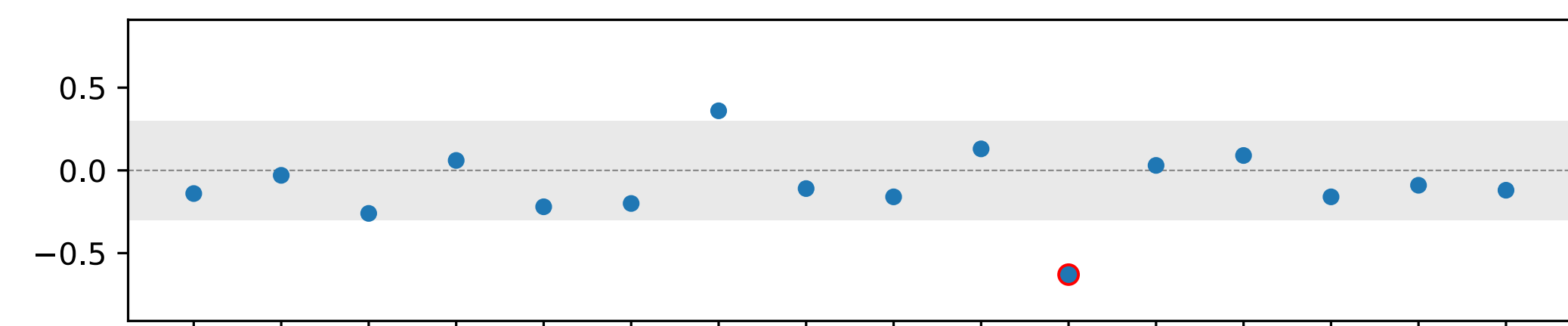


deviation / mm

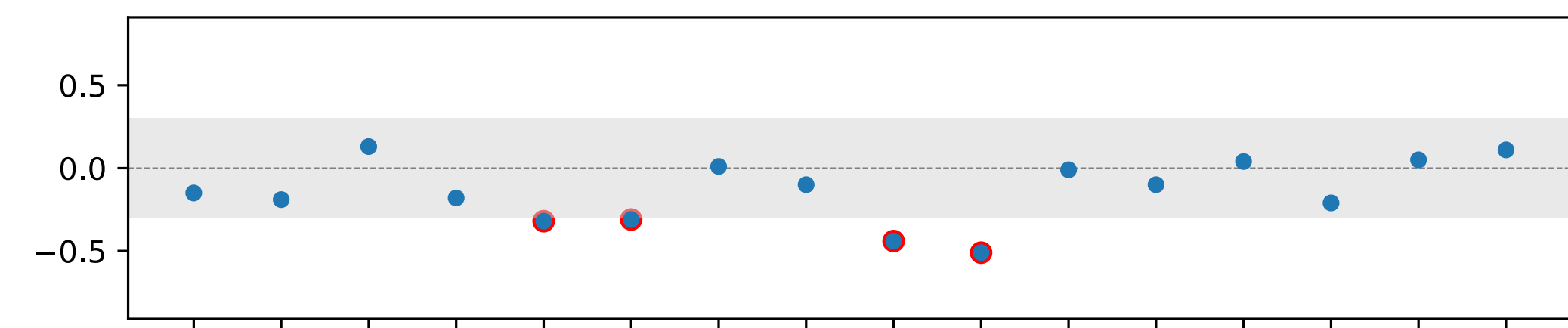
wheel 0



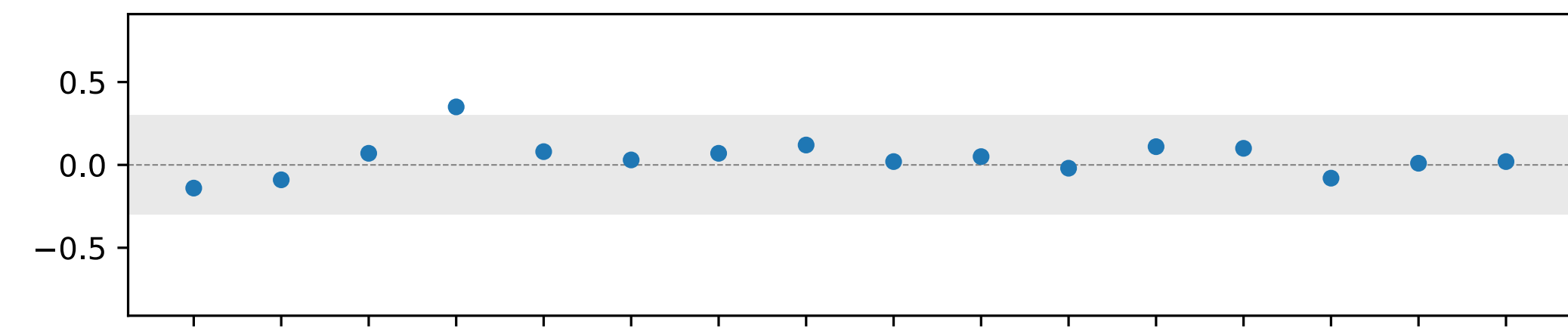
wheel 1



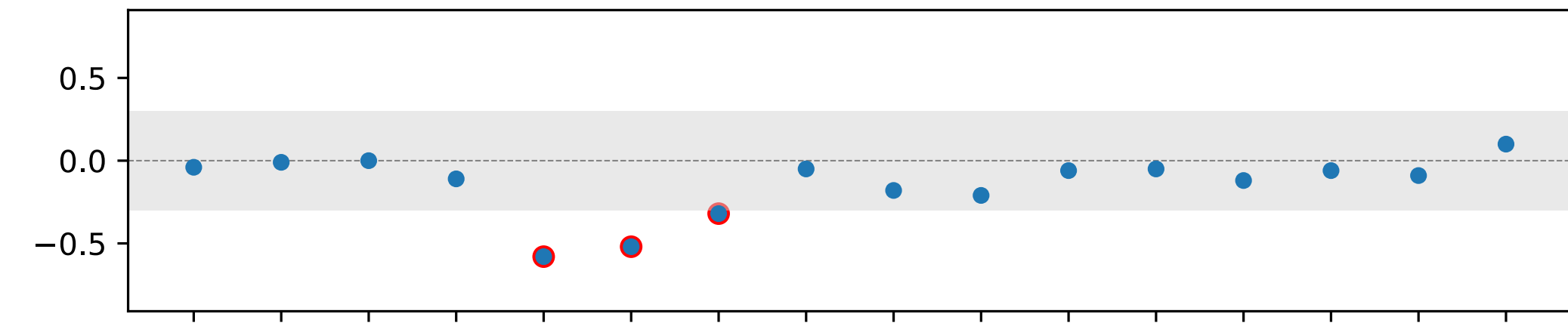
wheel 2



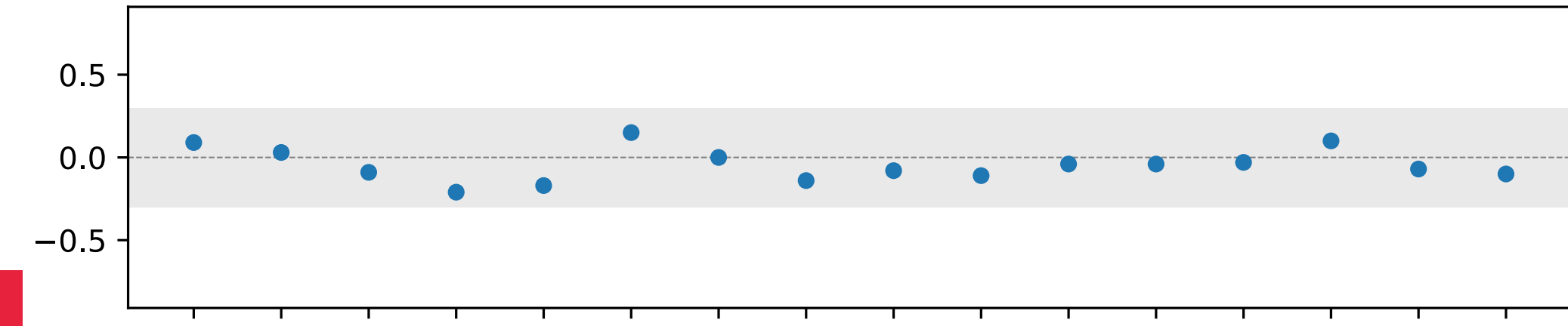
wheel 3



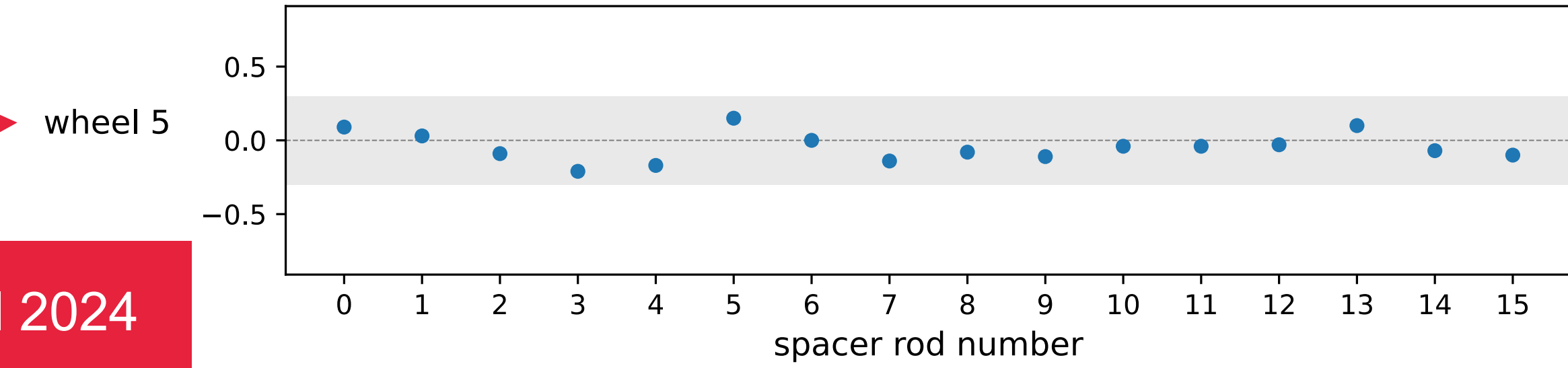
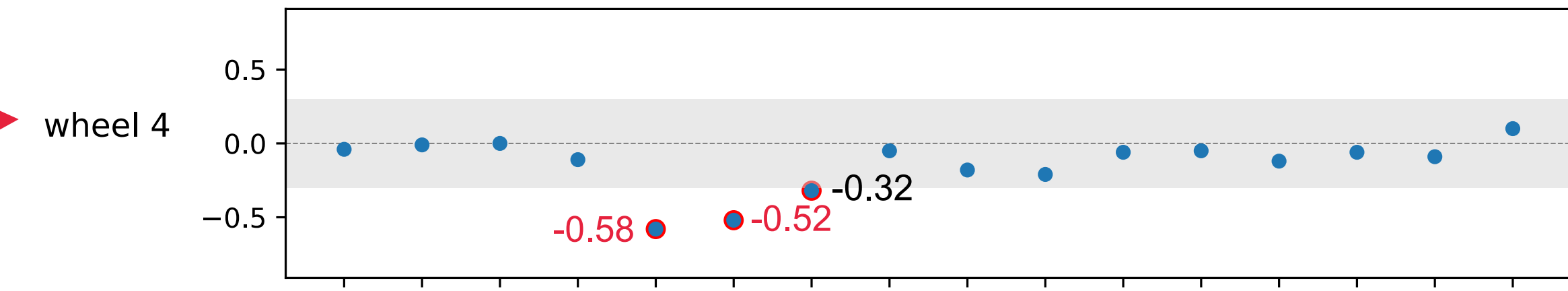
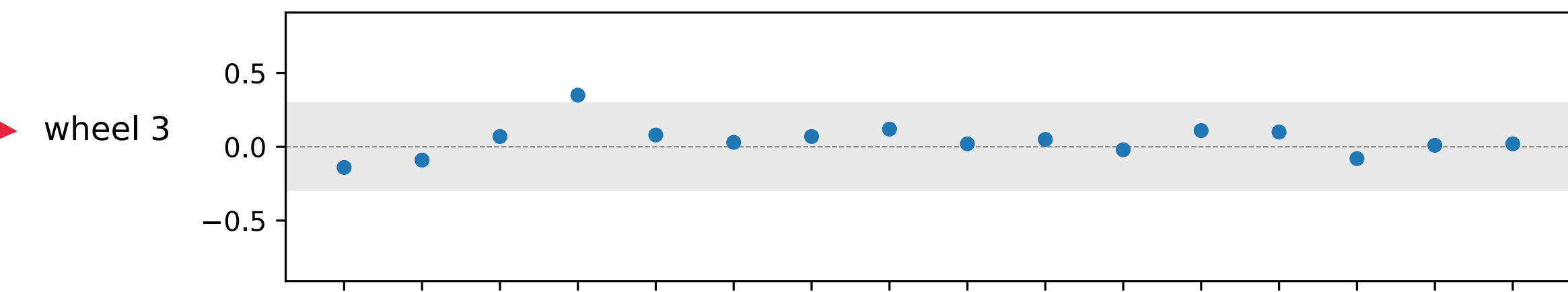
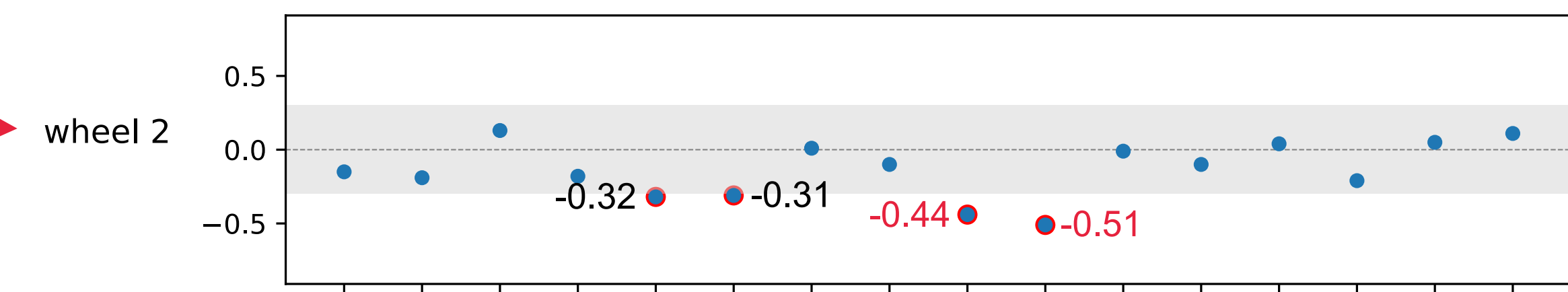
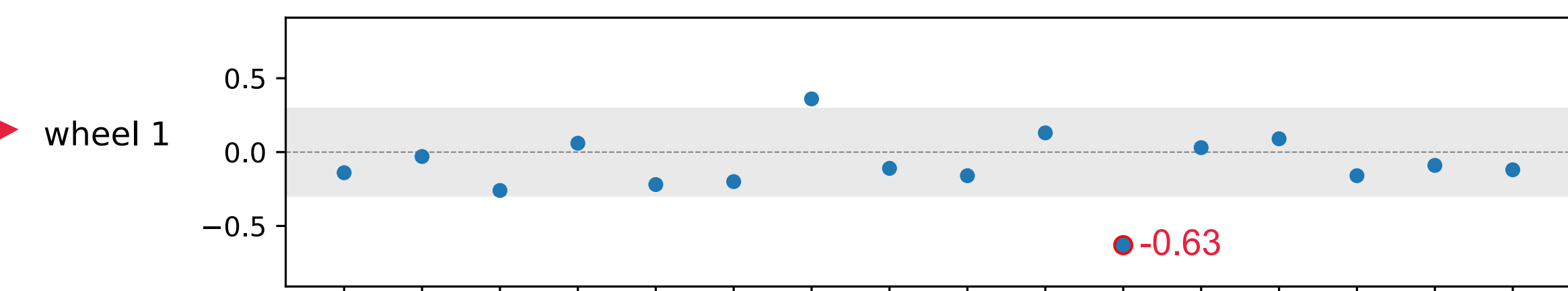
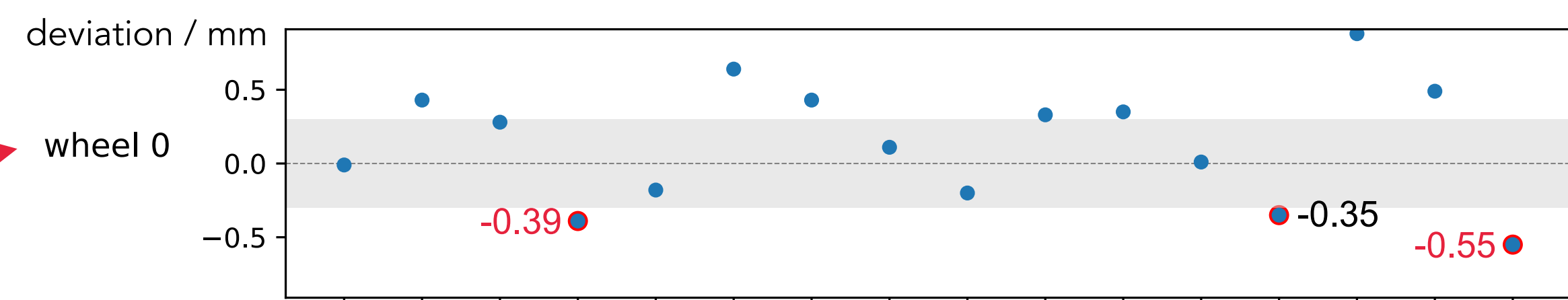
wheel 4



wheel 5

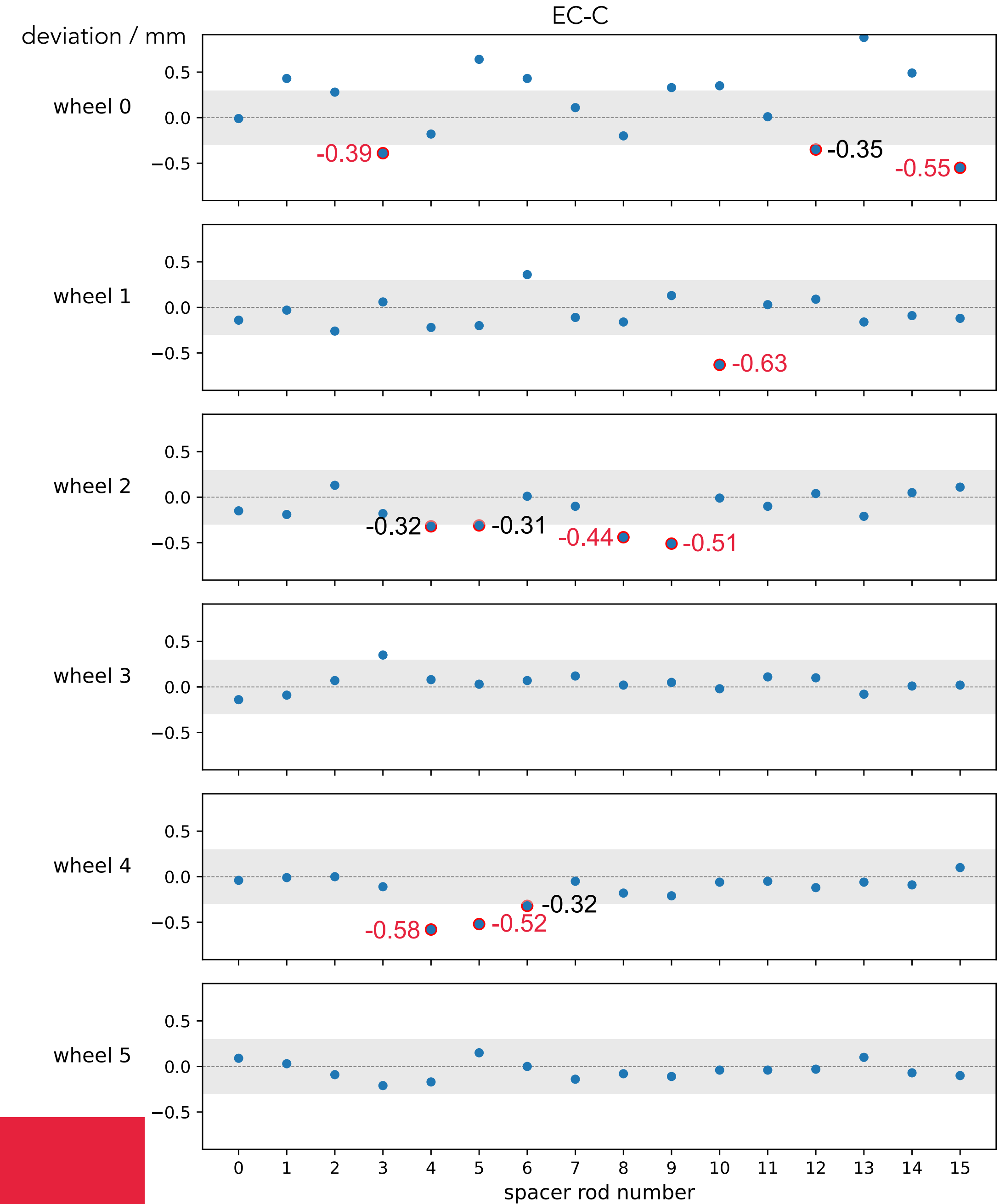
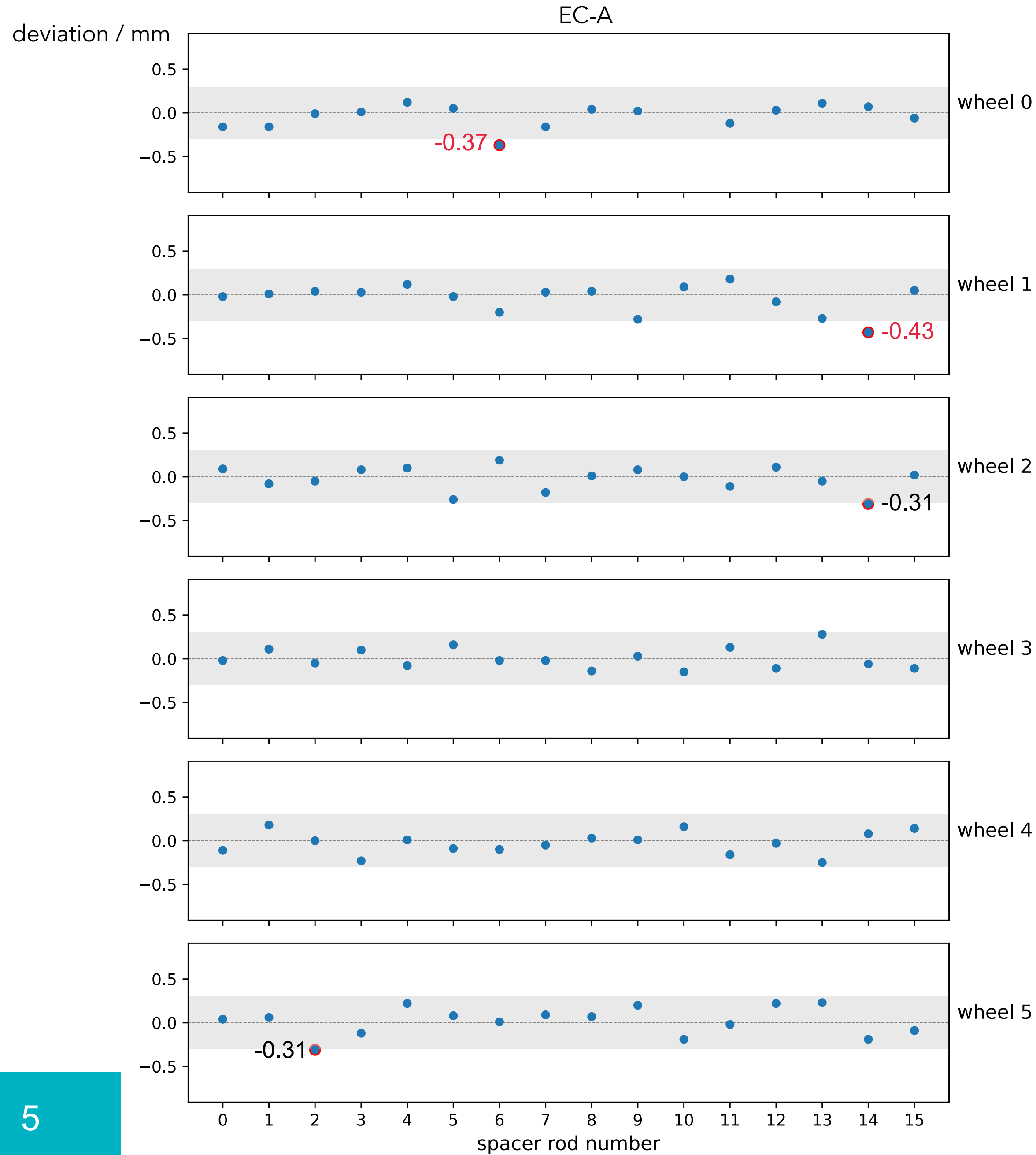


# EC-C. Measured distance between lower petals and wheel rim



# Comparison between End-Caps

Note: spacer rod numbering corresponds to different spacer rods for each EC

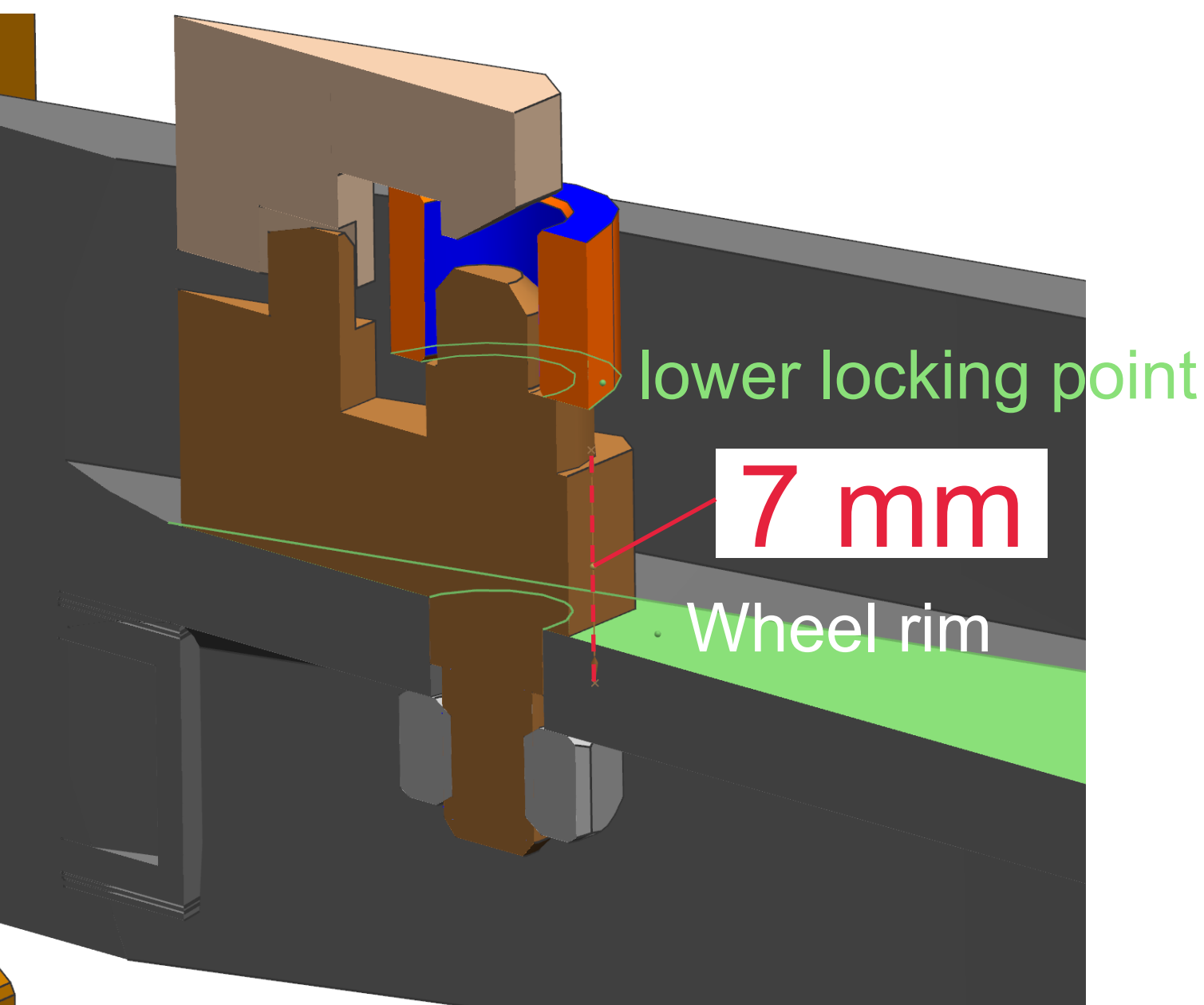


# CONCLUSIONS

We measured a 7mm distance, with a deviation of  $\pm 300\mu\text{m}$ , between the wheel rim and the petals on the lower locking points.

This indicates consistent alignment across all wheels and the 16 measured locations per wheel.

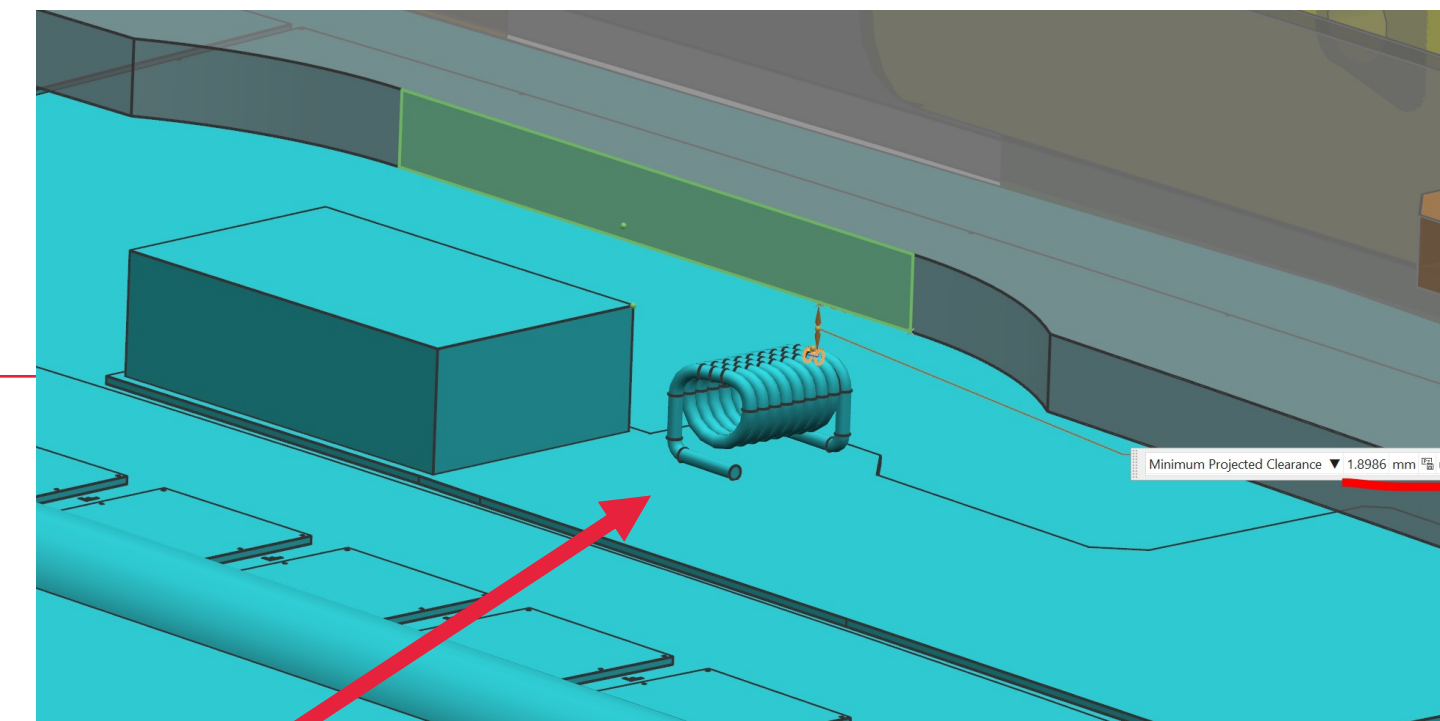
However, out of the entire End-Cap, eleven positions were observed with distances smaller than 6.7mm. This raises concerns regarding potential issues if the petals exceed the expected thickness.



**QUESTION:** What's the current nominal clearance?

- w/o electronics: 7mm (-0.63mm at worst location)
- w/ electronics:

- ☞ Due to coil on the powerboard, near the RF box: Vertical clearance 1.9mm  $\Rightarrow$  not critical
- ☞ If interposer added under the powerboard. How much clearance would it take away? -0.5mm?
- ☞ If RF5 box moves  $\Rightarrow$  critical



# Data EC-C

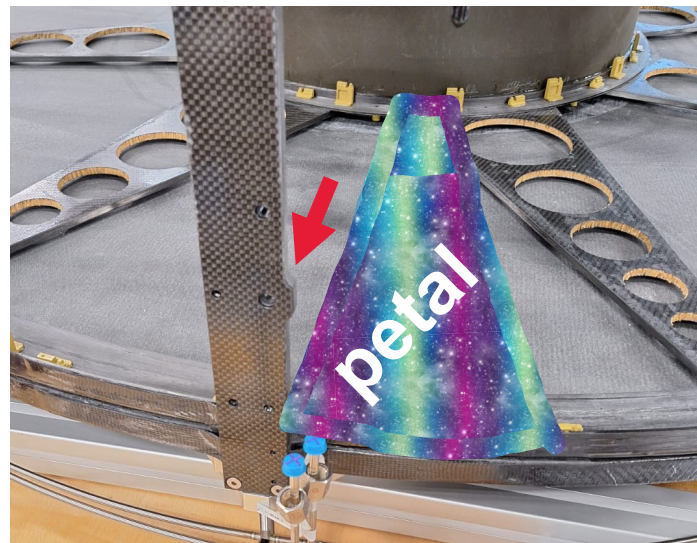
These numbers represent the deviations with respect to the nominal height on the lower locking points: 7mm.

COLOR:

< -0.3 mm **PROBLEMATIC**

(Lowest wheel)

spacer rod	Distance wheel #5 / mm	Distance wheel #4 / mm	Distance wheel #3 / mm	Distance wheel #2 / mm	Distance wheel #1 / mm	Distance wheel #0 / mm
0	+0.09	-0.04	-0.14	-0.15	-0.14	-0.01
1	+0.03	-0.01	-0.09	-0.19	-0.03	0.43
2	-0.09	0	0.07	0.13	-0.26	0.28
3	-0.21	-0.11	0.35	-0.18	0.06	<b>-0.39</b>
4	-0.17	<b>-0.58</b>	0.08	<b>-0.32</b>	-0.22	-0.18
5	0.15	<b>-0.52</b>	0.03	<b>-0.31</b>	-0.20	0.64
6	0	<b>-0.32</b>	0.07	0.01	0.36	0.43
7	-0.14	-0.05	0.12	-0.10	-0.11	0.11
8	-0.08	-0.18	0.02	<b>-0.44</b>	-0.16	-0.20
9	-0.11	-0.21	0.05	<b>-0.51</b>	0.13	0.33
10	-0.04	-0.06	-0.02	-0.01	<b>-0.63</b>	0.35
11	-0.04	-0.05	0.11	-0.10	0.03	0.01
12	-0.03	-0.12	0.10	0.04	0.09	<b>-0.35</b>
13	0.10	-0.06	-0.08	-0.21	-0.16	0.88
14	-0.07	-0.09	0.01	0.05	-0.09	0.49
15	-0.10	0.10	0.02	0.11	-0.12	<b>-0.55</b>



Spacer rod 0 is the one inside the beamer with the **external edge**. We followed clock-wise direction around inner cylinder.