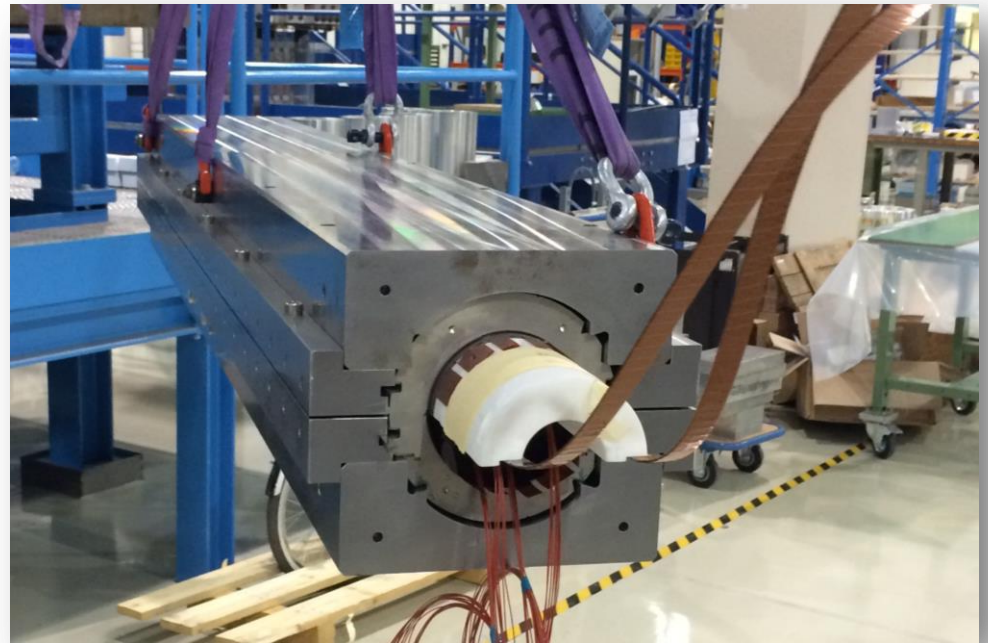


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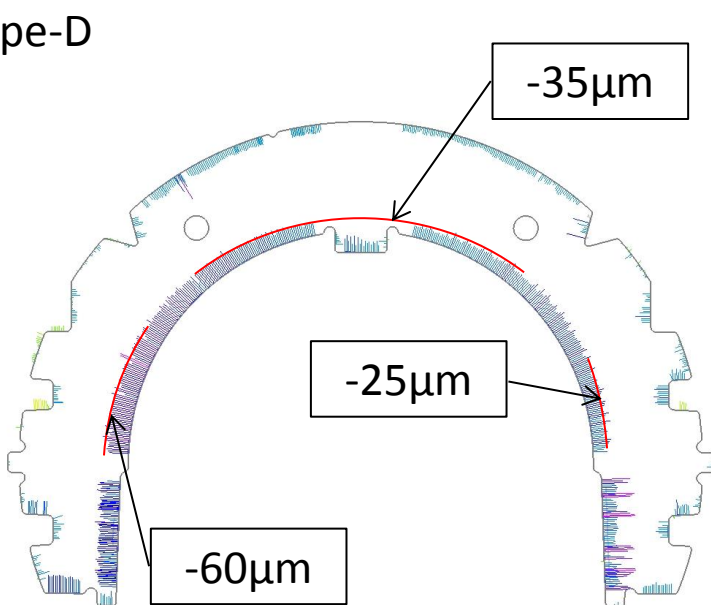
## Coil CMM - Shimming Plan

CMM measurements of Coils #101 and #105

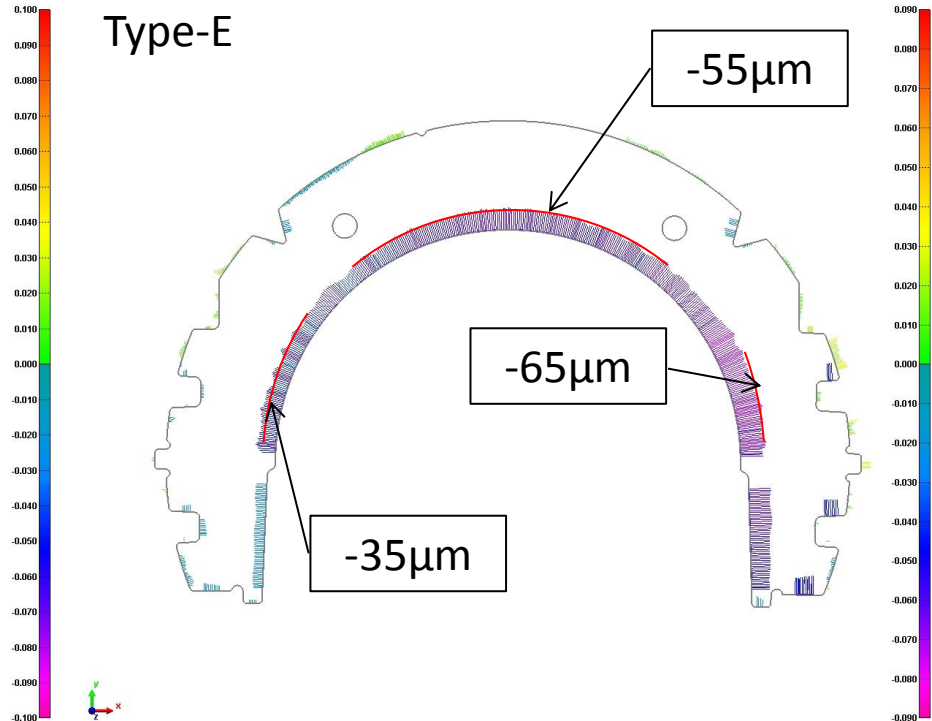


# COLLAR(MALVESTITI) MEASUREMENTS

Type-D



Type-E



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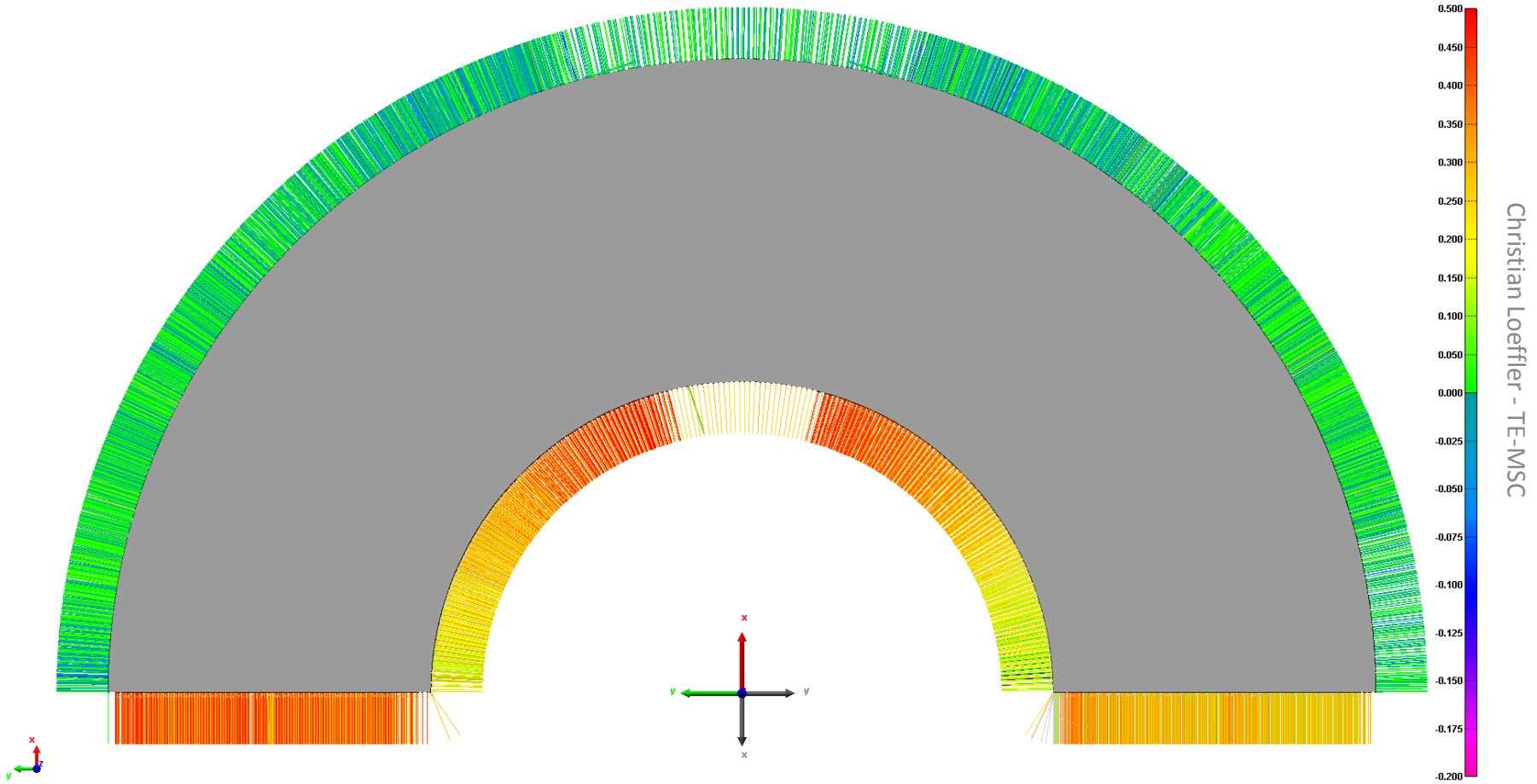


## conclusion

- Both, D&E are very similar in size
- FARO and CMM show the same result
- On average, relative to the keys, we have **80 $\mu$ m** more space in height.



# CMM coils 105 & Cu101

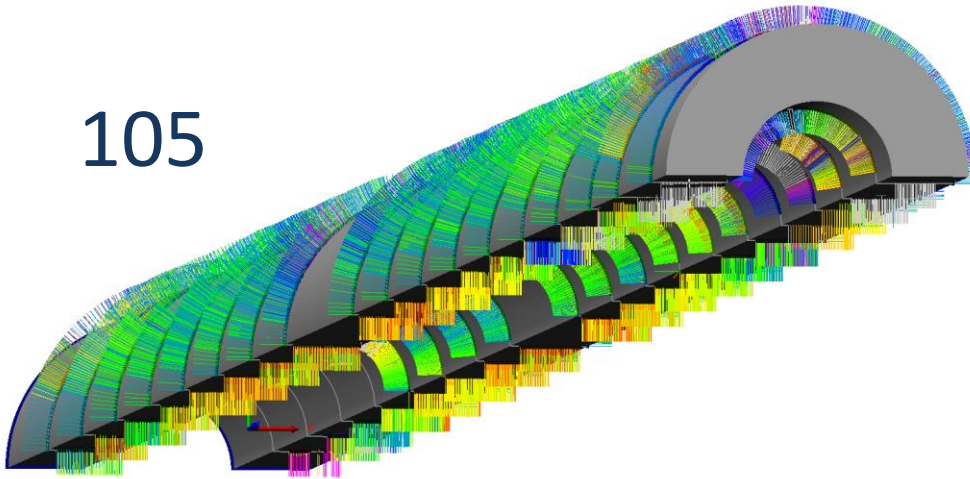


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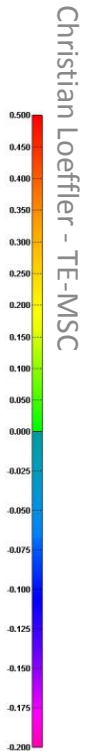
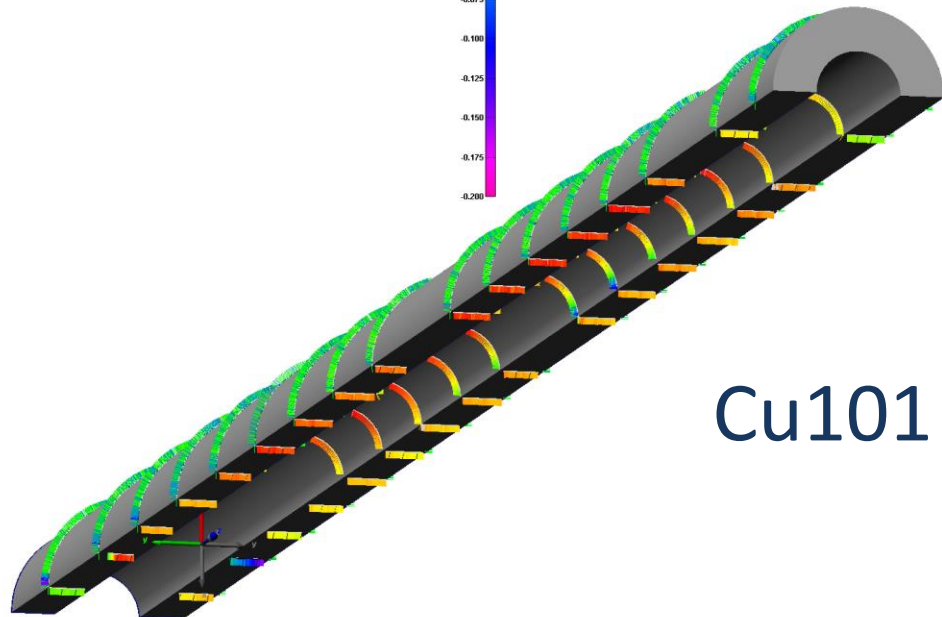


# Comparsion 105 and Cu101

105



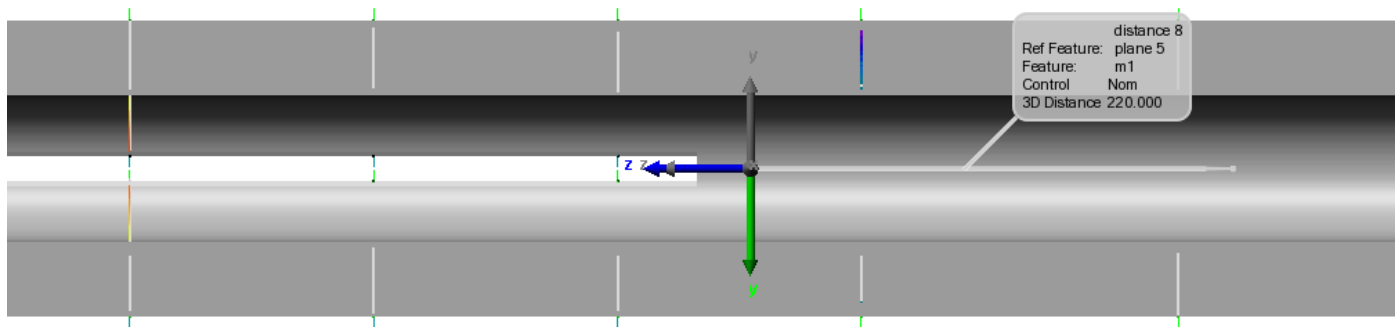
Cu101





# definition coordinate system

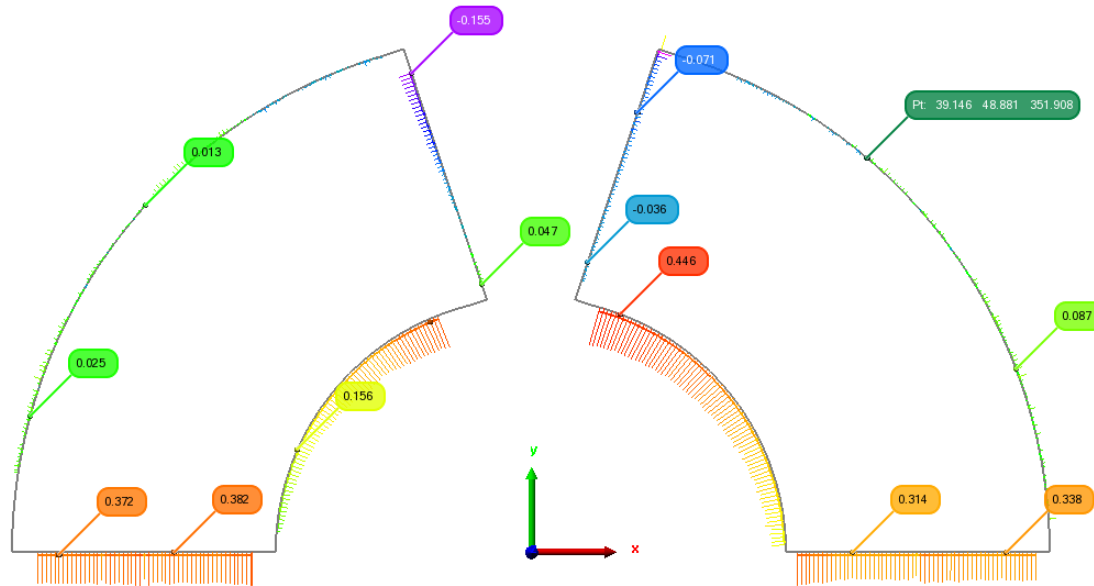
lead end





# Alignment of the cross-sections

- Best-fit on outer diameter
- Best-fit on the pole surfaces



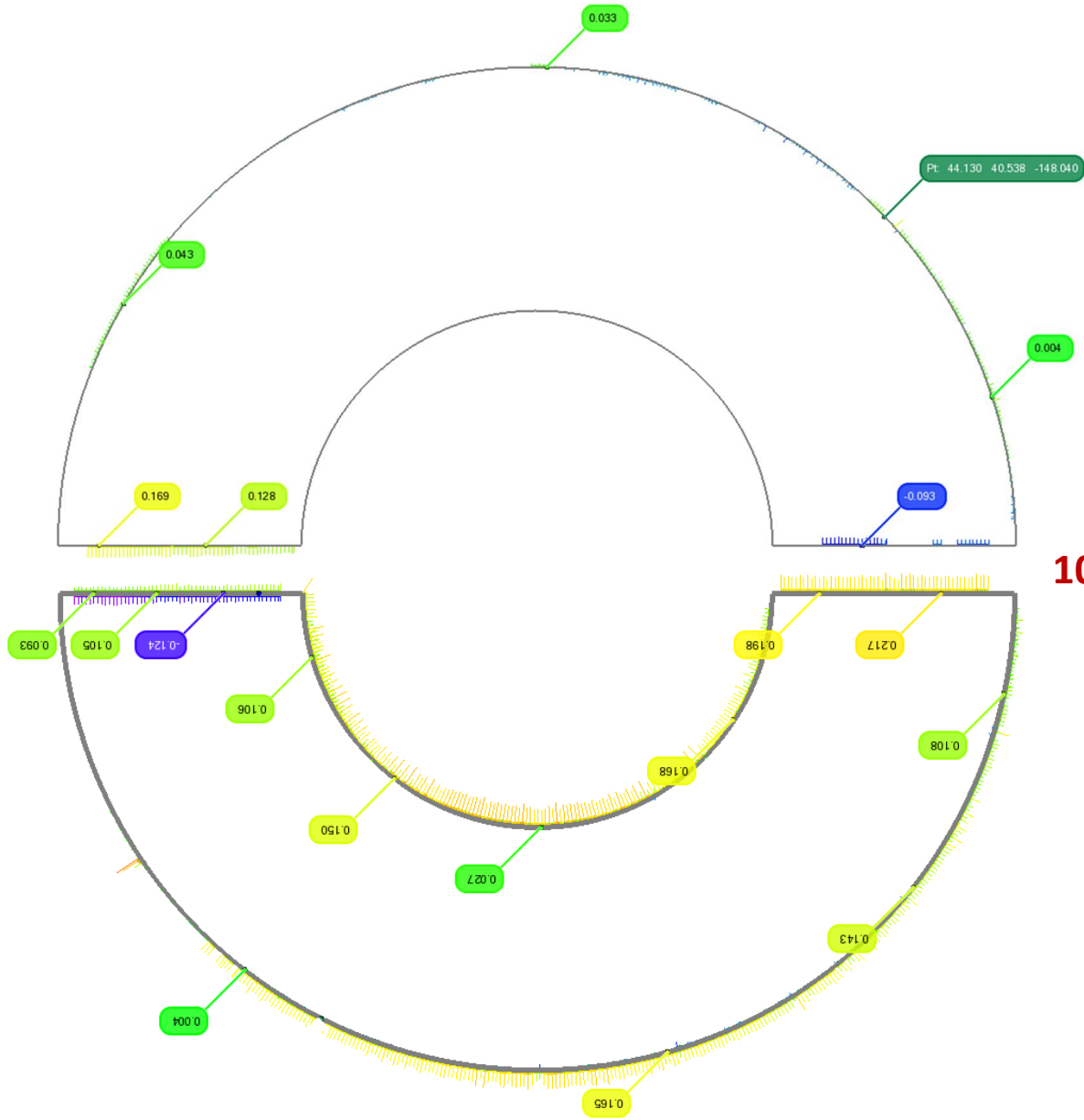




# cross-section -150mm (lead end)

105

150  $\mu\text{m}$



100  $\mu\text{m}$

101

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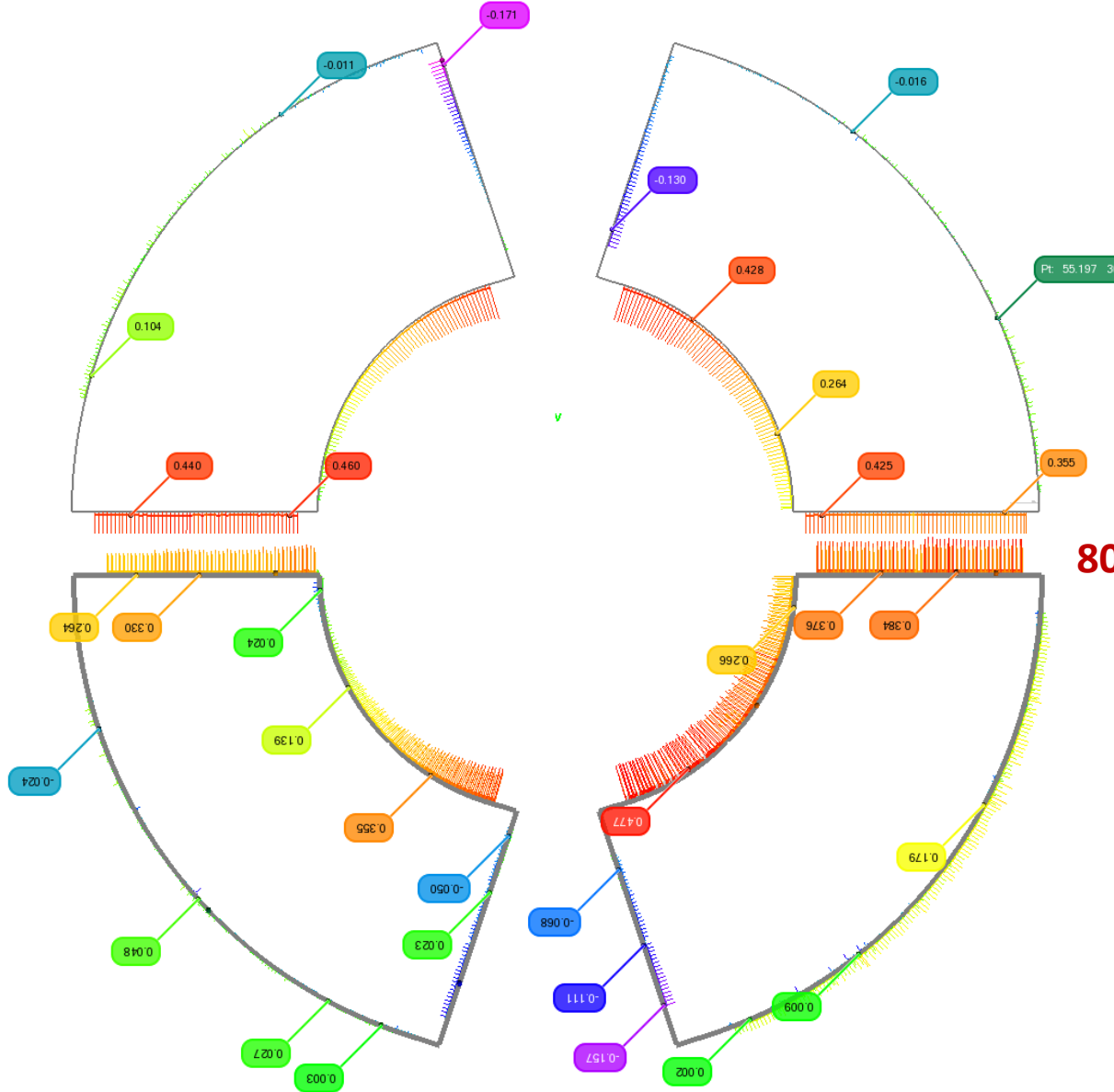
# cross-section 750mm (middle of the coil)

105

101

750  $\mu\text{m}$

800  $\mu\text{m}$



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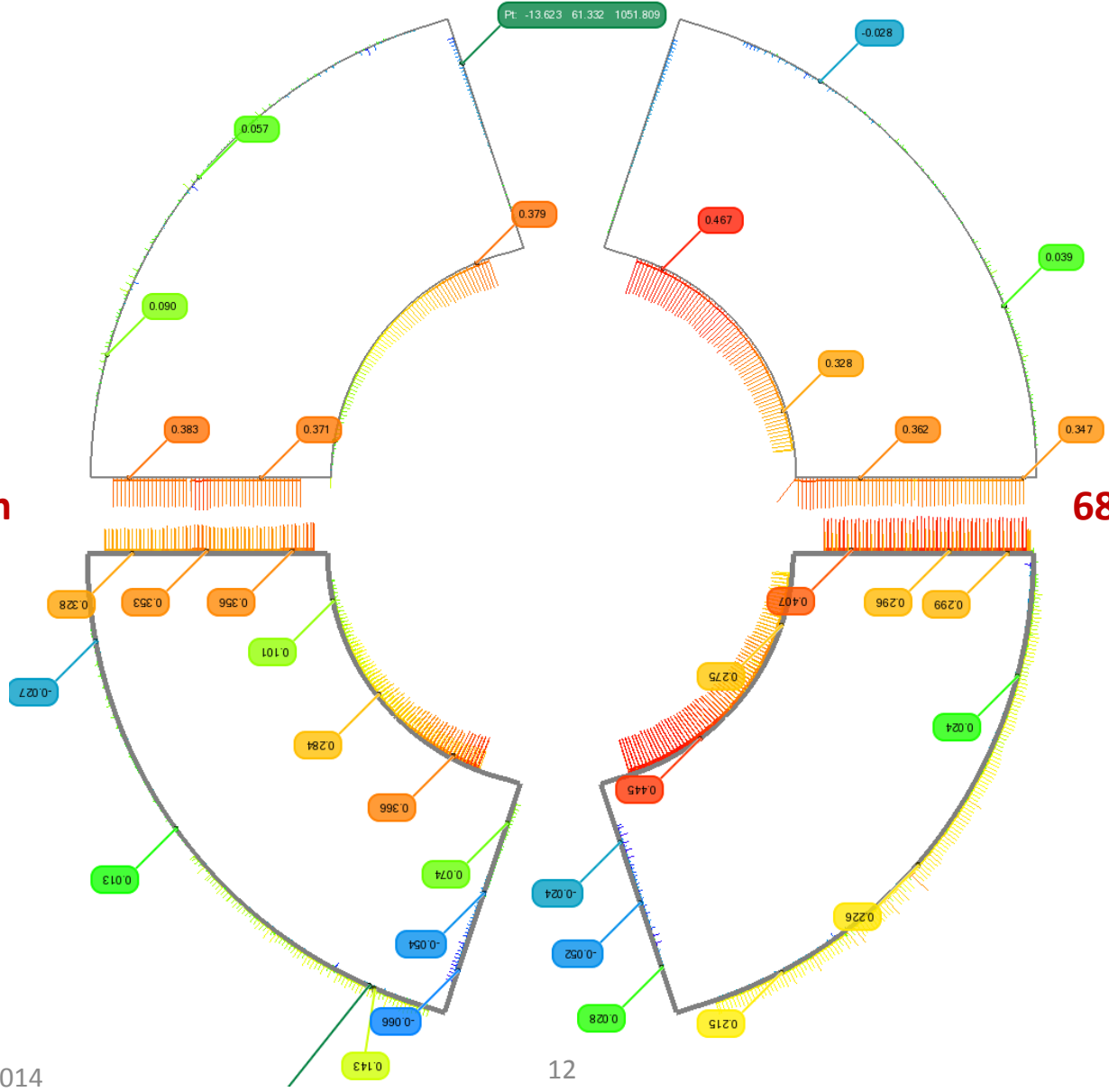
# cross-section 1050mm

105

101

730  $\mu\text{m}$

680  $\mu\text{m}$



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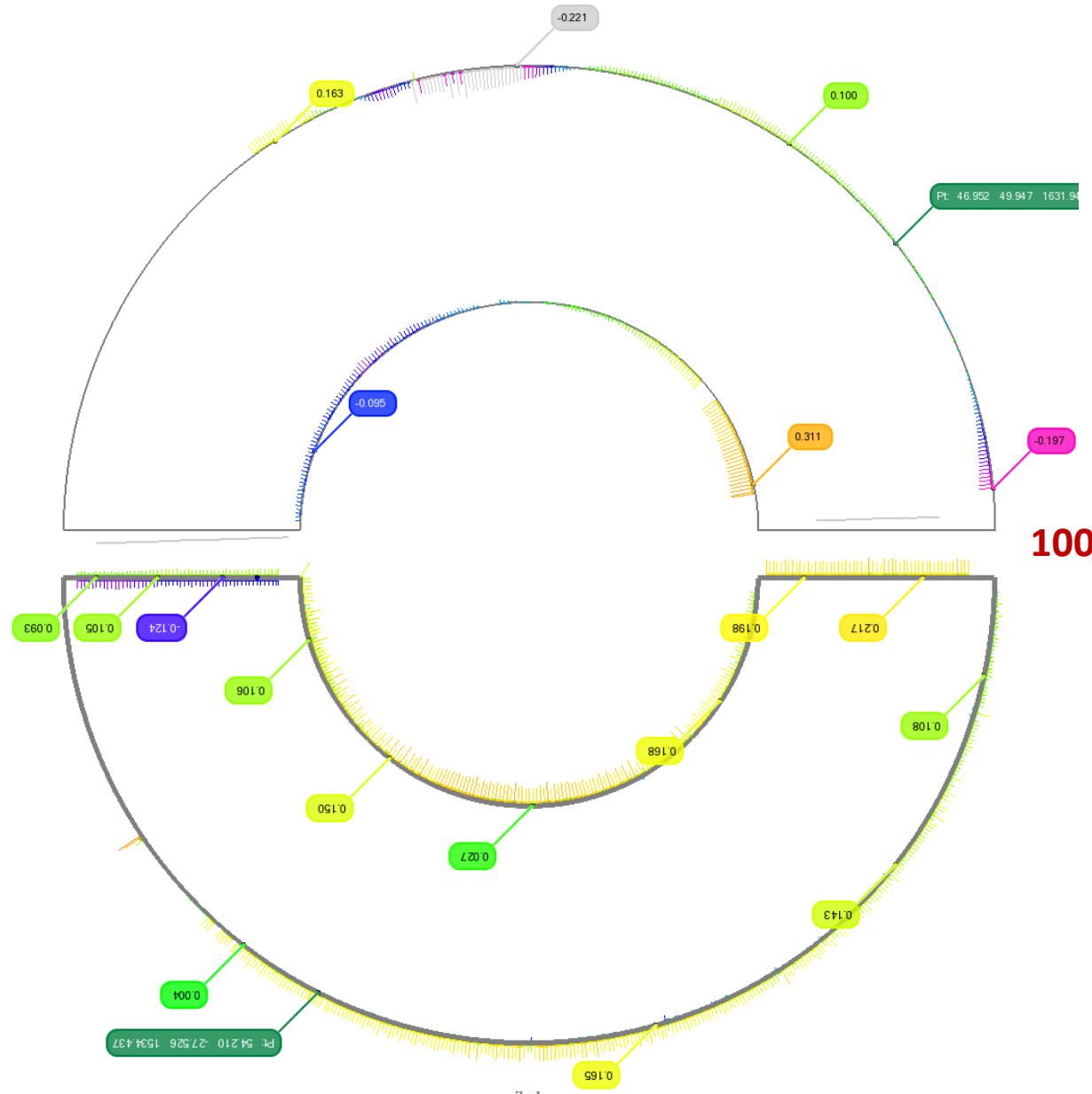
# cross-section 1500mm

105

50µm

101

100 µm



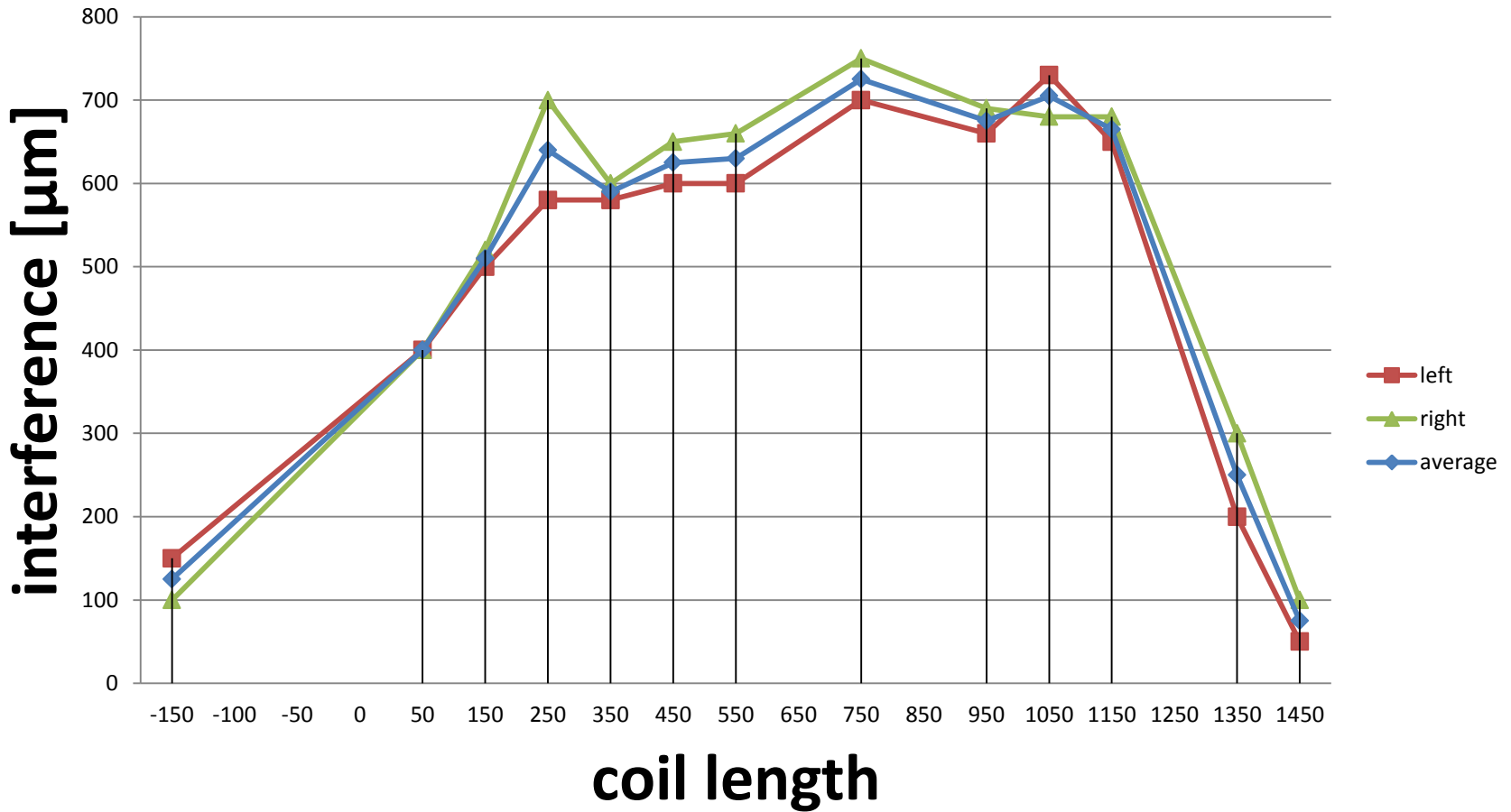
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# Interference between 105 & 101



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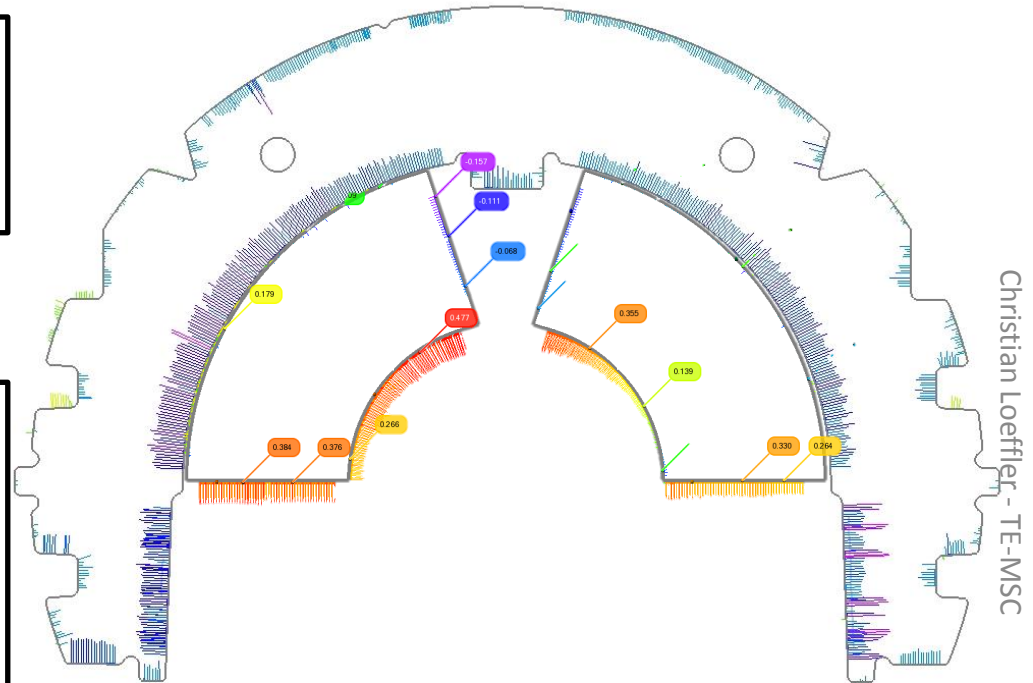
# conclusion

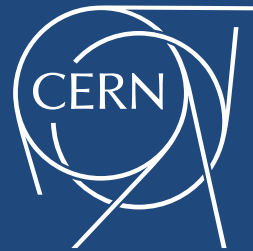
## Nominal shimms:

- Mid-Plane Shim = 0.06mm
- Pole-Coil Shim = 0.2mm
- Pole-Collar Nose Shim = 0.2mm (Nominal)

## Shimming solution:

- Problem: **700 $\mu$ m** to tall
- Collars(Malvestiti) 700-80 $\mu$ m
- Mid-Plane Shim 620-60 $\mu$ m
- **560 $\mu$ m left**
- **Solutions:**
  - Remove ground isolation?
  - Smaller collaring shoe?
  - Etc.





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Thank you for your attention





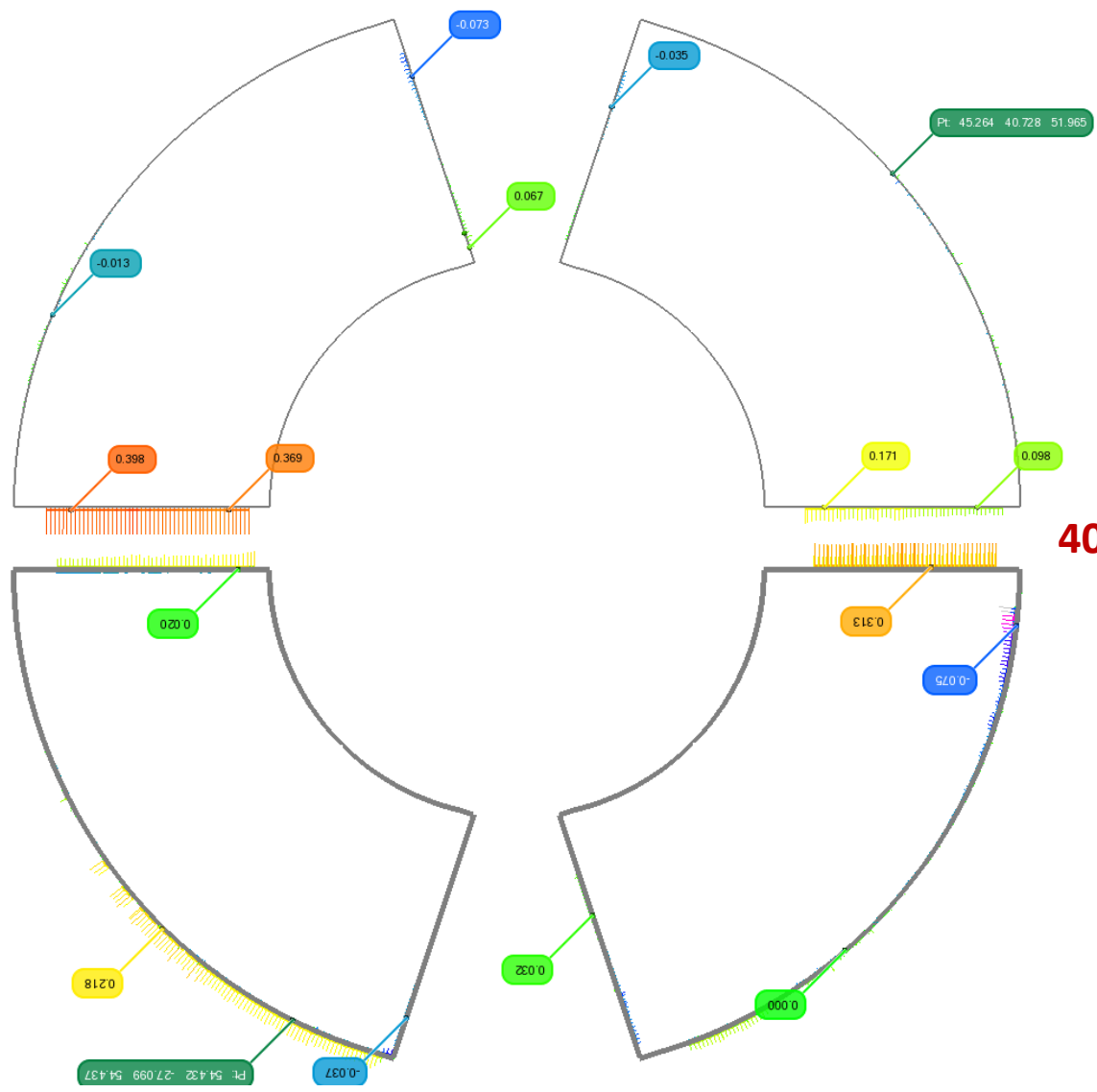
# cross-section 50mm

105

101

400  $\mu\text{m}$

400  $\mu\text{m}$



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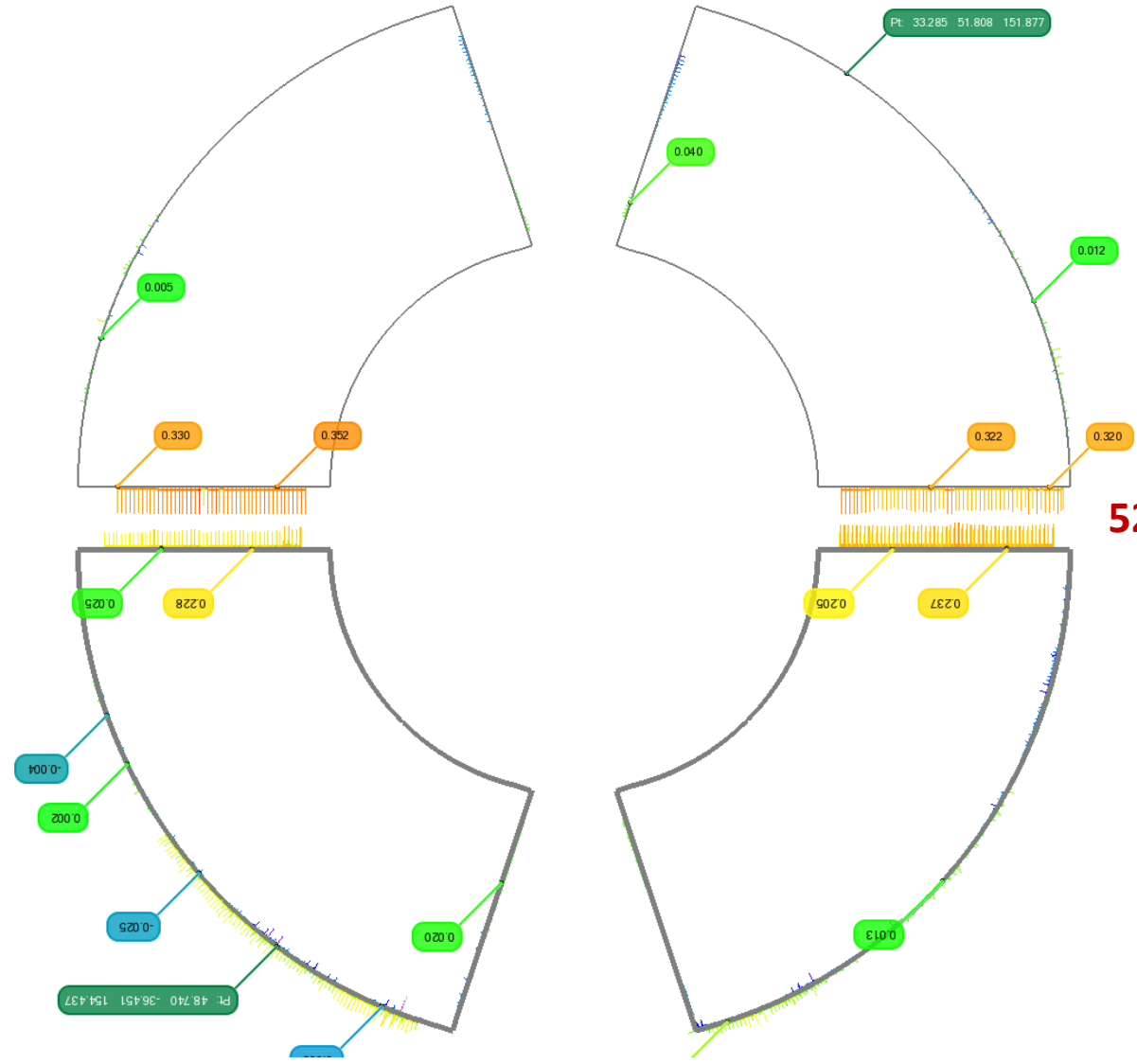
# cross-section 150mm

105

101

500  $\mu\text{m}$

520  $\mu\text{m}$



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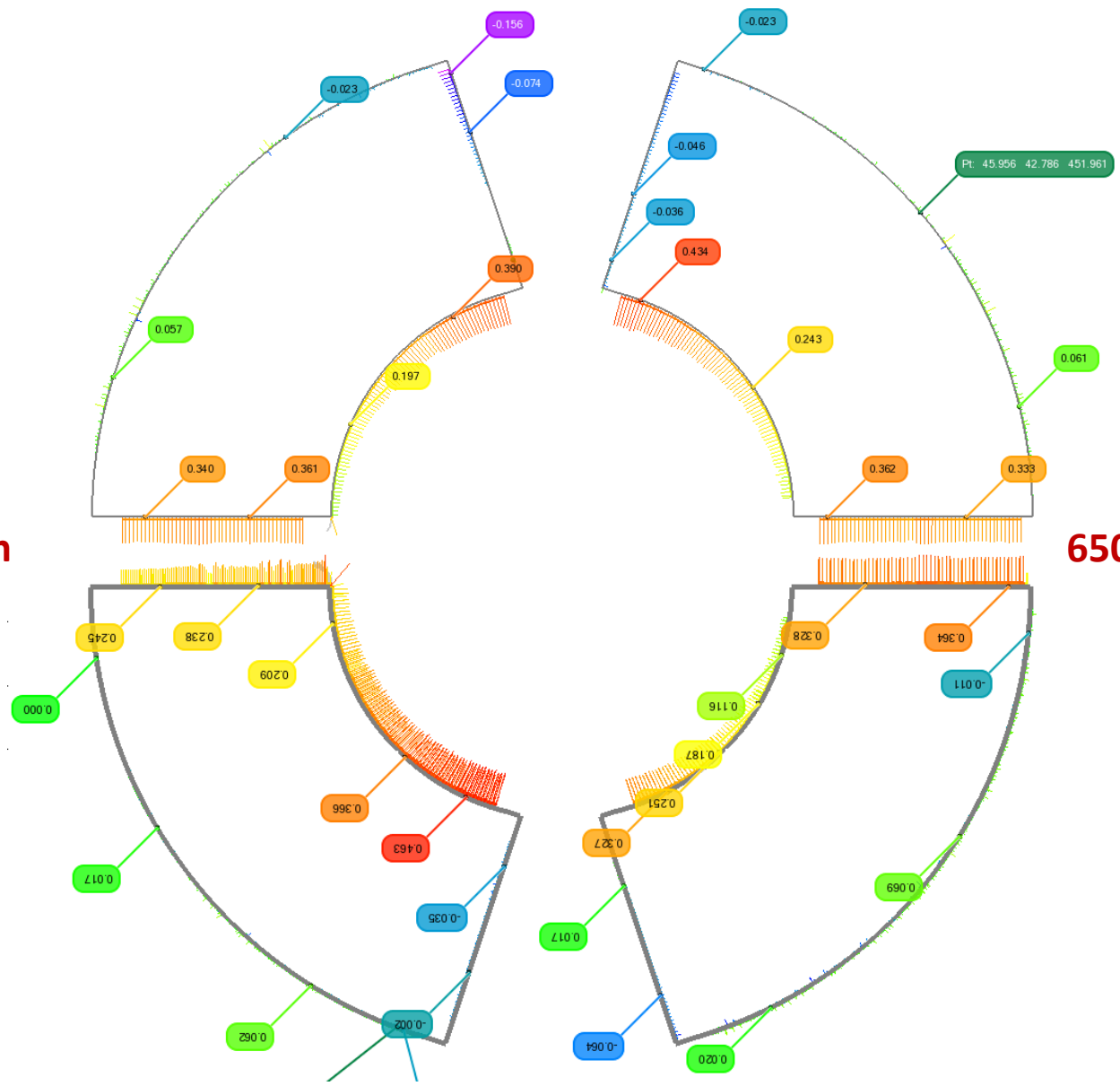
# cross-section 450mm

105

101

600  $\mu\text{m}$

650  $\mu\text{m}$



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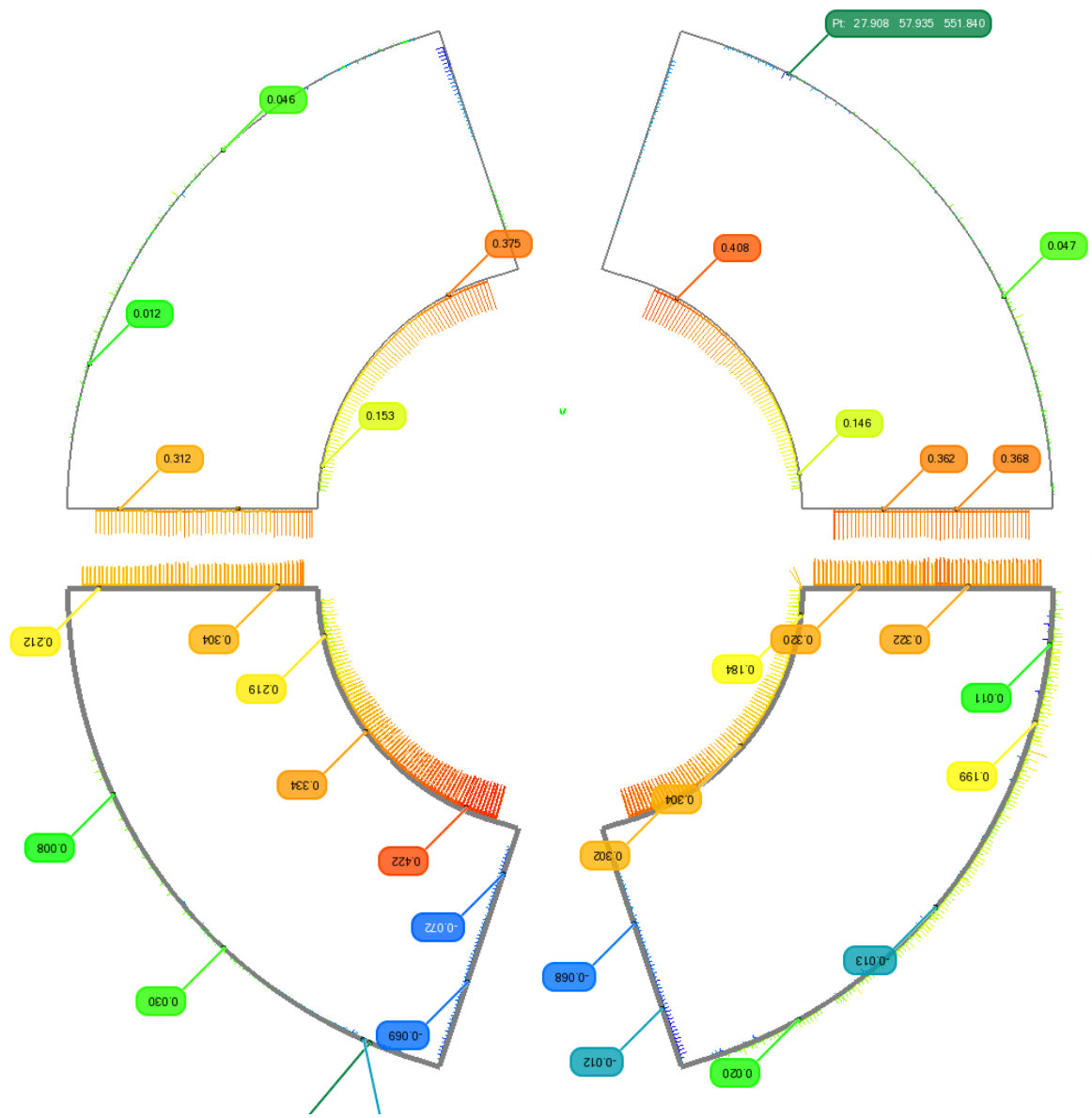
# cross-section 550mm

105

101

600  $\mu\text{m}$

660  $\mu\text{m}$



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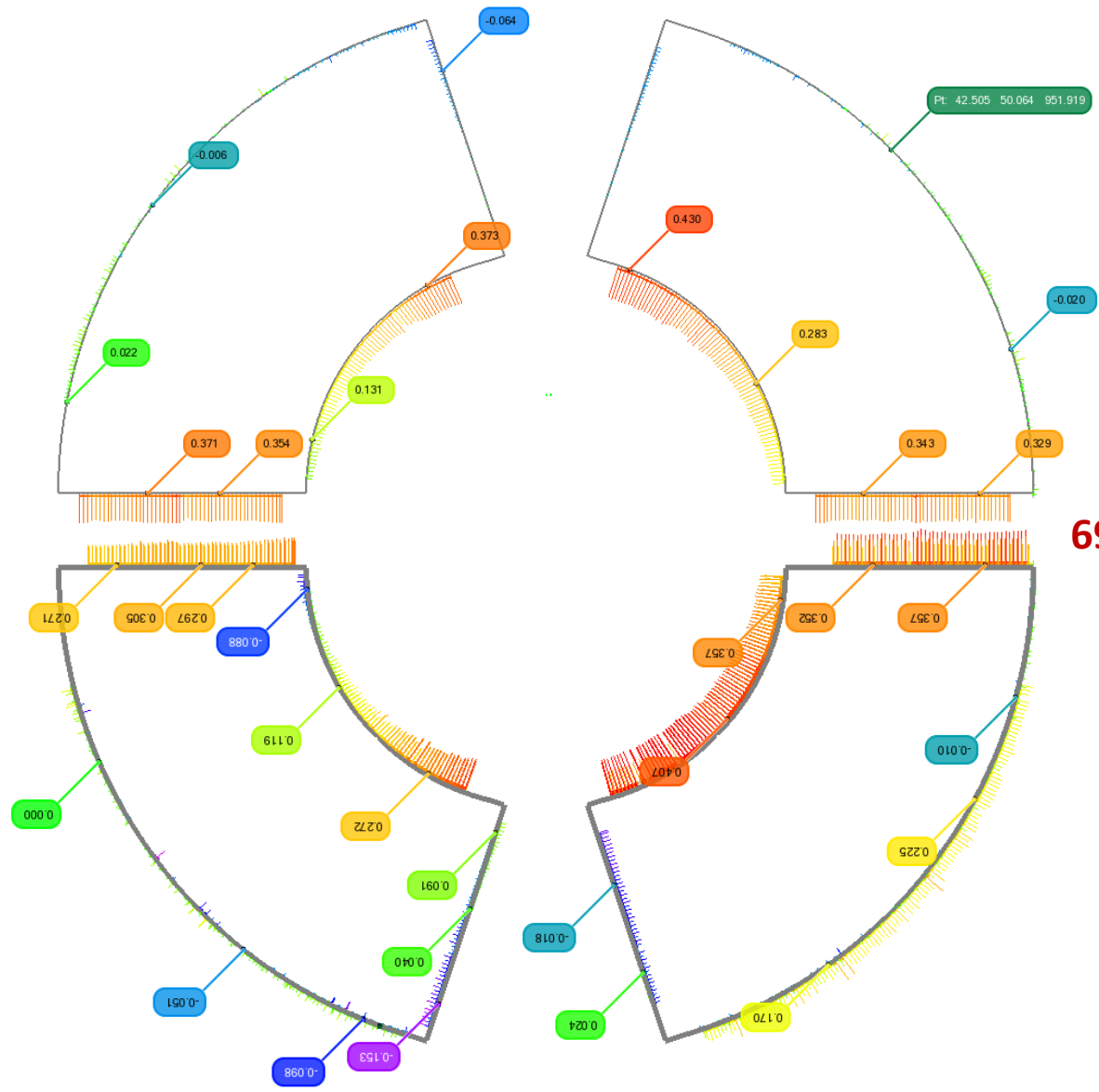
# cross-section 950mm

105

101

660  $\mu\text{m}$

690  $\mu\text{m}$



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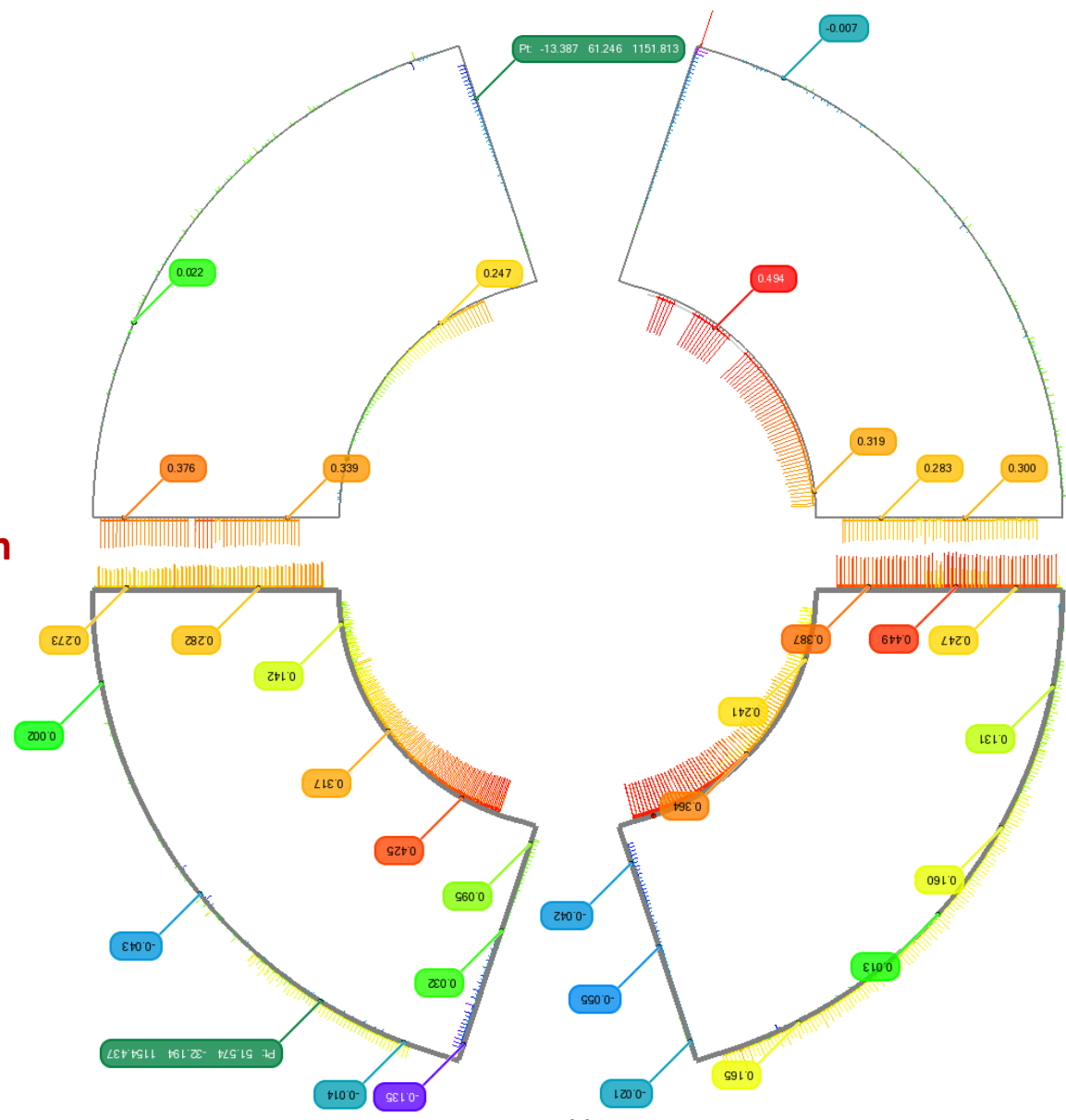
# cross-section 1150mm

105

101

650  $\mu\text{m}$

680  $\mu\text{m}$



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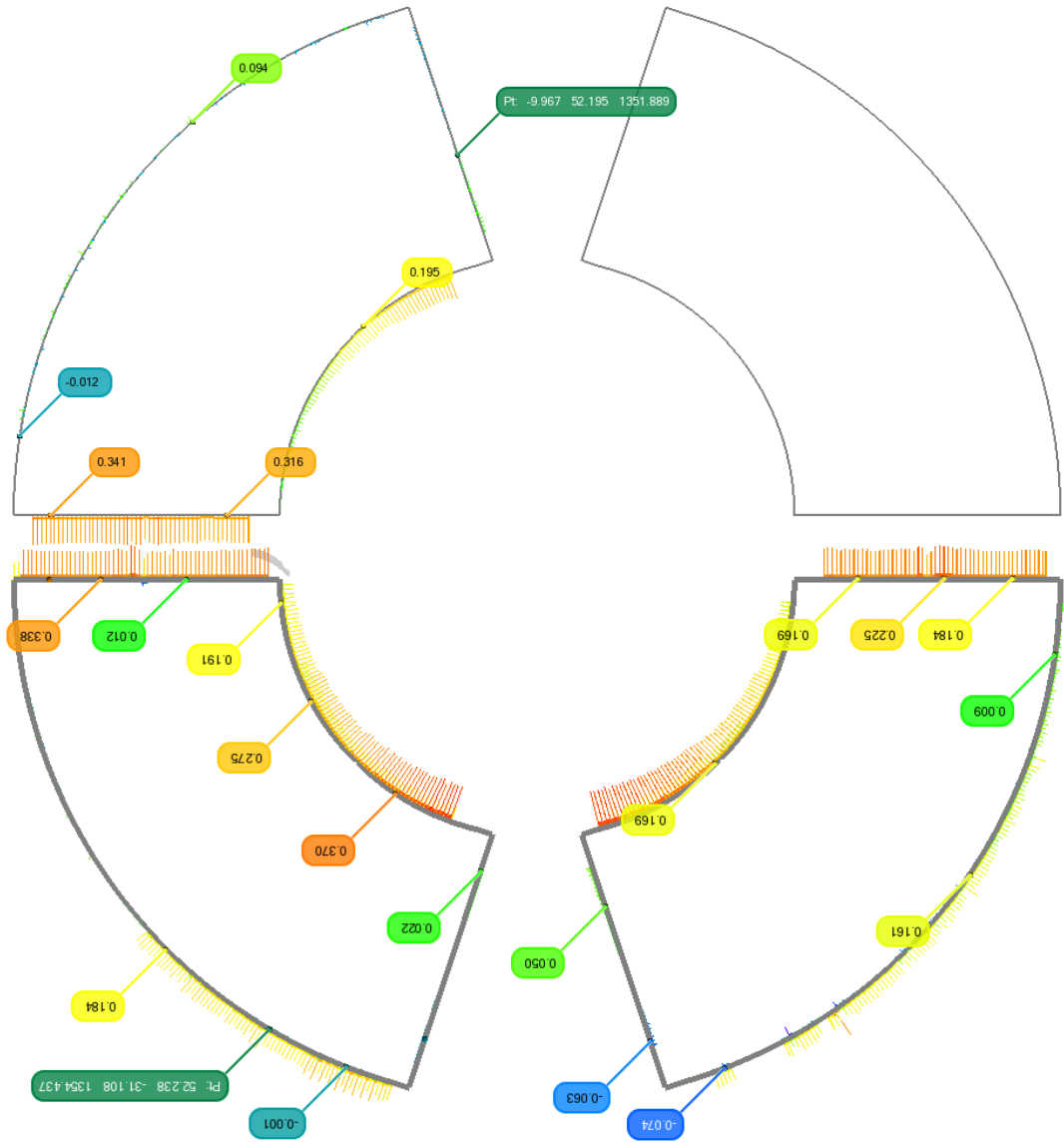
# cross-section 1350mm

105

101

650  $\mu\text{m}$

Ca. 500 $\mu\text{m}$



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