All-Silicon Update

05.02.2026

Nana Chychkalo

New Board by Orcel

NANA BOARD DESIGN

8mm

140mm

Air flow gaps

Top view (resistors)

Bottom view (NTC sensors)
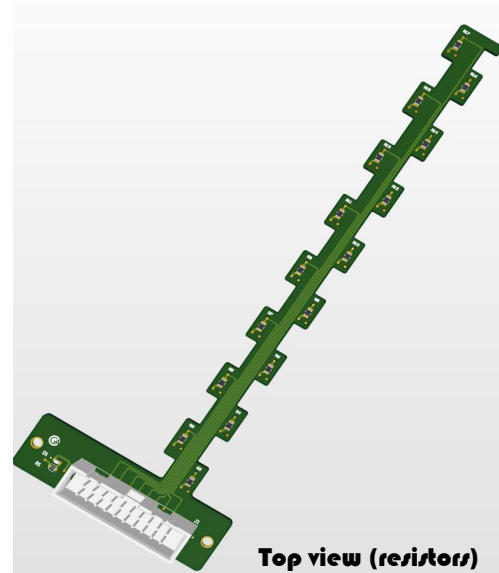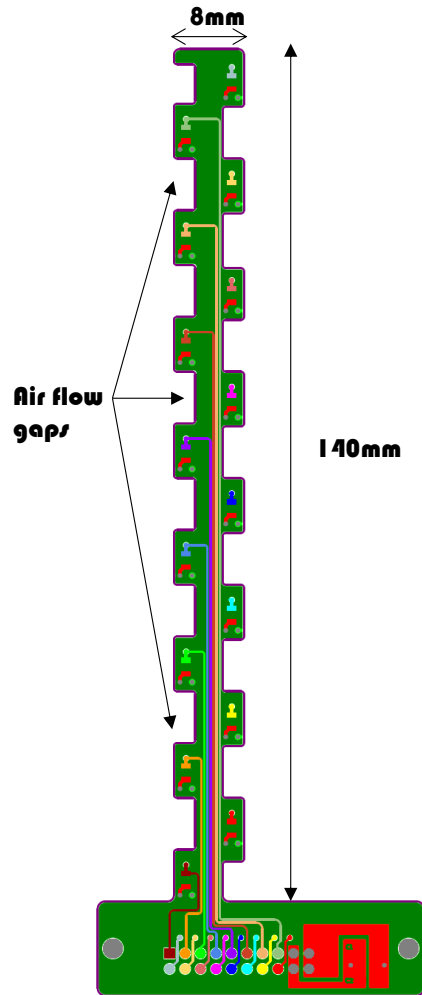
JLCPCB

Select Product

| Standard PCB/PCBA | Advanced PCB/PCBA | SMT Stencil | Flex Heater | Mechatronic Parts | 3D Printing | CNC Machining |

Online PCB Quote

Re-Upload | Gerber Viewer

Detected 4 layer board of 155.8×53.8mm(6.13×2.12 inches).

Base Material	FR-4	Flex	Aluminum	Copper Core	Rogers	PTFE Teflon
Layers	1	2	4	High Precision PCB 6	8	10	12	14	16	More
Dimensions	53.8	*	155.8	mm
PCB Qty	5
Product Type	Industrial/Consumer electronics	Aerospace	Medical

PCB Specifications

Different Design	1	2	3	4
Delivery Format	Single PCB	Panel by Customer	Panel by JLCPCB
PCB Thickness	0.4mm	0.6mm	0.8mm	1.0mm	1.2mm	1.6mm	2.0mm
PCB Color	Green	Purple	Red	Yellow	Blue	White	Black
Silkscreen	White
Material Type	FR4 TG135	FR4 TG155	Nan Ya NP-140F	KB6164 - TG135	Nan Ya NP-155F
	KB-6165 - TG155	S1141 TG140	S1000H TG155

Charge Details

Engineering fee	€20.05
Via Covering	€0.00
Surface Finish	€0.00
Board	€3.68

PCB Build Time
3-4 days	€0.00
3 days PCBA Only	€0.00
2-3 days	€53.72

Calculated Price €23.73
Additional charges may apply for special cases

SAVE TO CART

Shipping Estimate €17.96
DHL Express 2-4 business days
Weight 0.26kg

Coupons Save €12.53 Save €7.52

Shopping cart overview
| Subtotal | €8.24 |
| Shipment | * €18.00 |

In Total * €26.24
* Estimated Amount

Only €41.76 left until FREE SHIPPING

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As a guest to the checkout
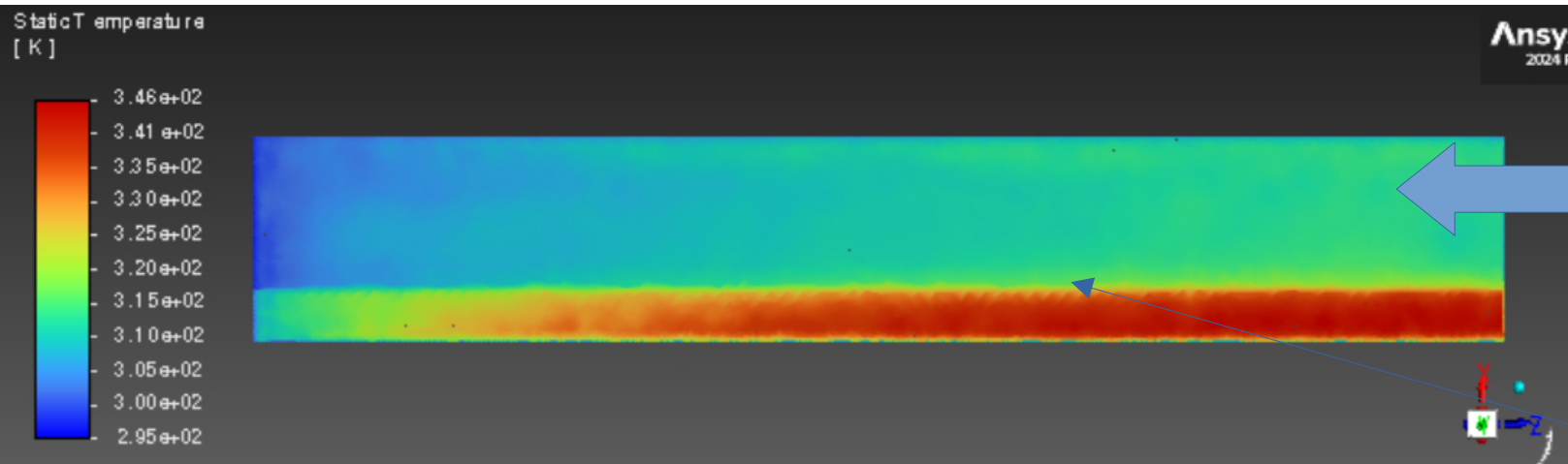
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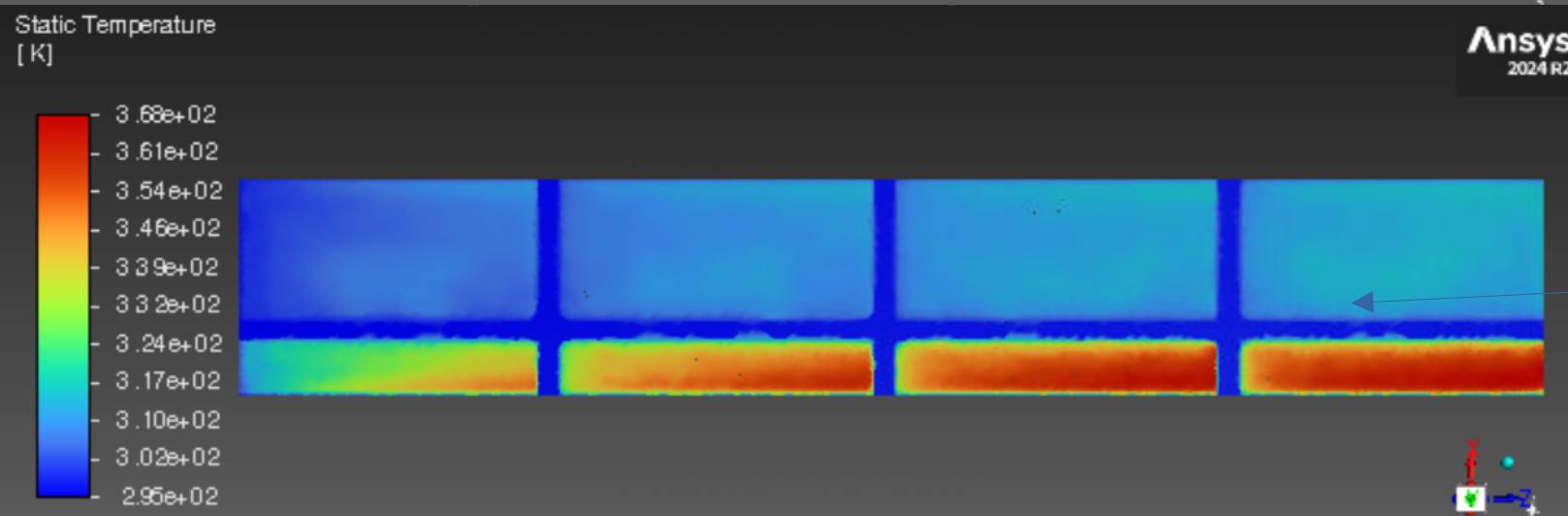
Cannot make the board smaller than 8mm

Unless we move to 8 layers (high precision pcb) → expensive

1

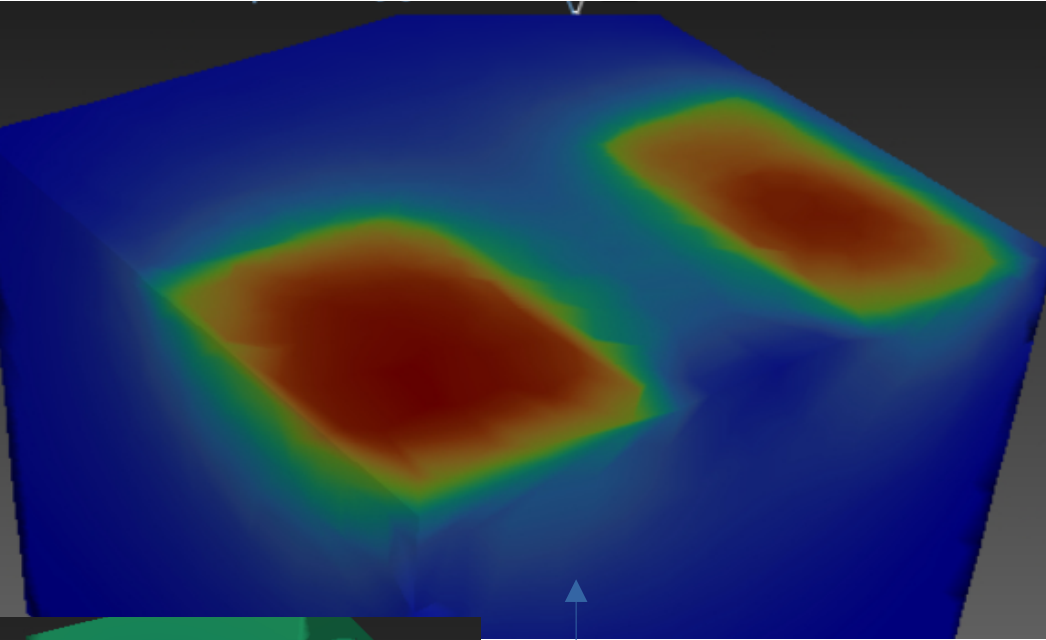# Tests for Segmentation (Simplified model)
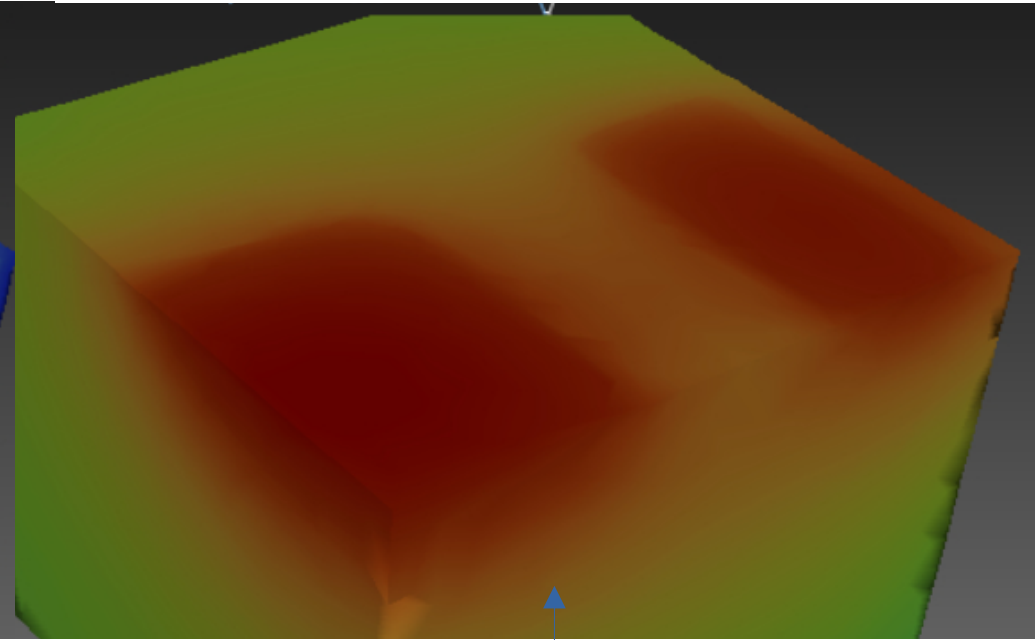

Matrix is well-simulated. Maximum ~40°C.

Automatic "insulation" of segments.

→

I'm running tests for removing insulation.

2

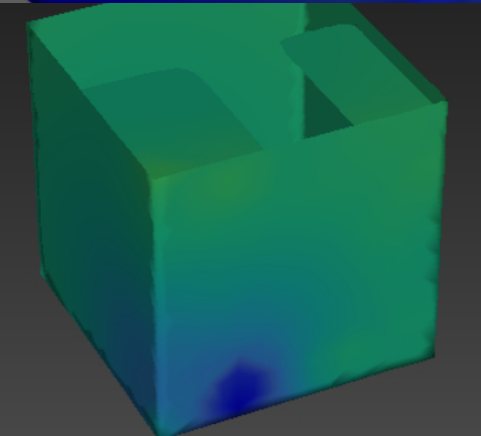# Tests for Segmentation (Toy Setup)
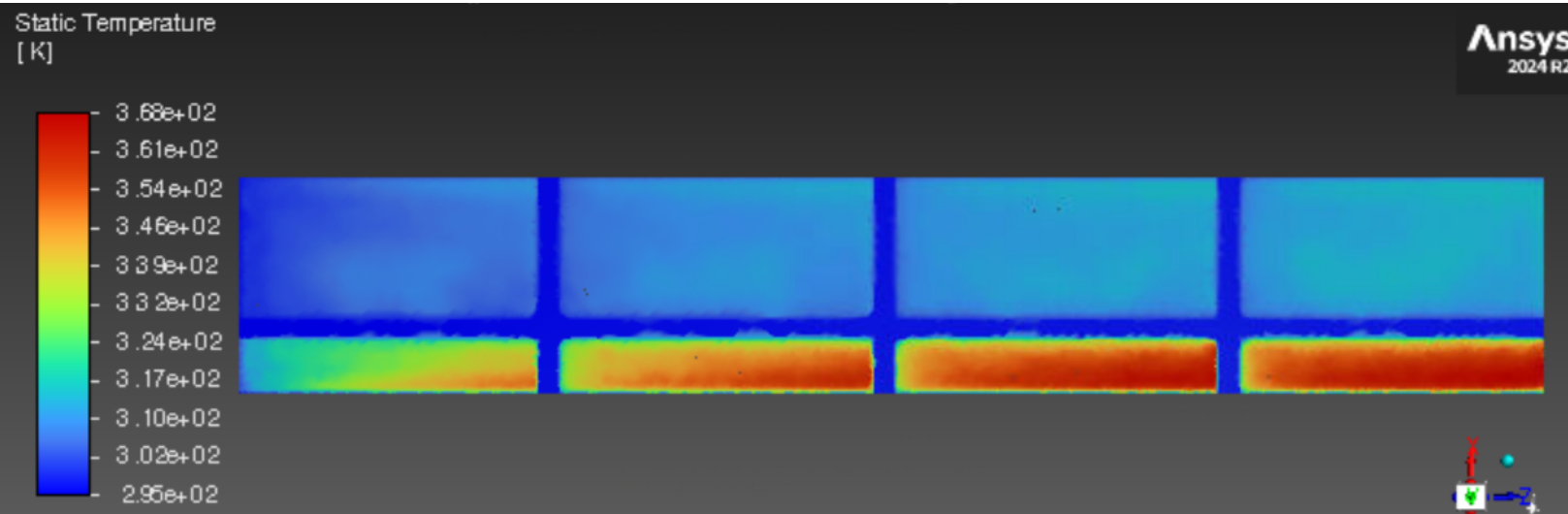

Partially insulated segments.

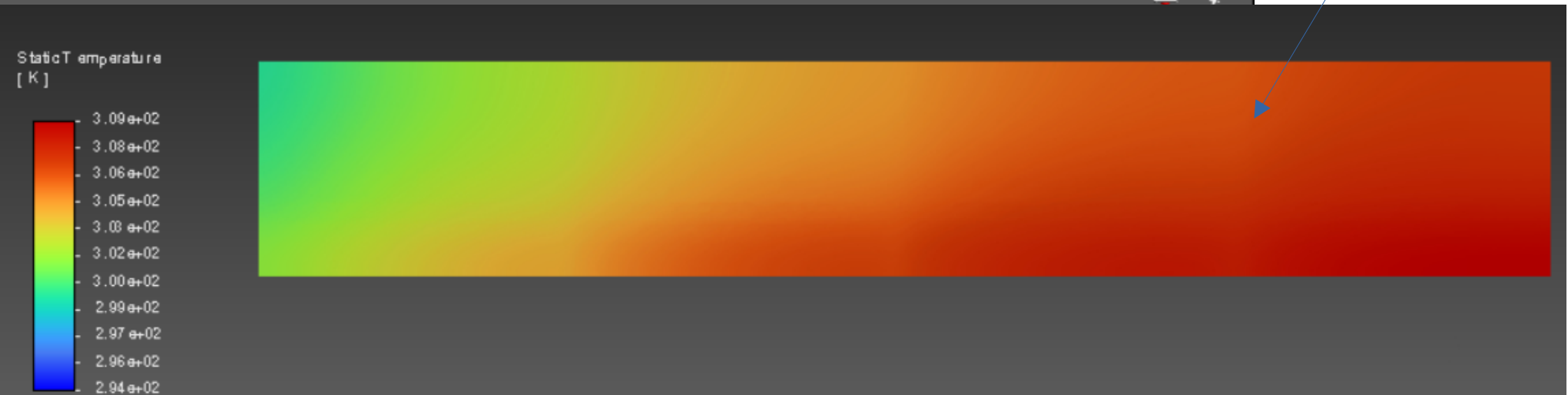Thermally connected segments.

Different cases of segmentation were tested.

← Volume-to-volume segmentation.

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Tests for Segmentation (Simplified model)

← From tests before.

Insulation removed – max ~37°C.

Airflow Measurements with NTC board

January 2026 measurements (working part of the NTC board)

Module	Matrix Power (W)	Periph. Power (W)	Total Power (W)	Temp No Fan (°C)	Fan V (V)	Temp With Fan (°C)	NTC Board Max (°C)
400 μm	2.396	4.131	6.527	91.9	11.8	34.1	35
400 μm	2.573	4.264	6.837	90.1	6.15	42.5	43
300 μm	2.408	4.151	6.558	84.7	11.81	32.8	33.1
300 μm	2.374	4.22	6.594	86.0	6.25	38.3	39.3

Excluded channels from this measurement, the board was shifted by one chip
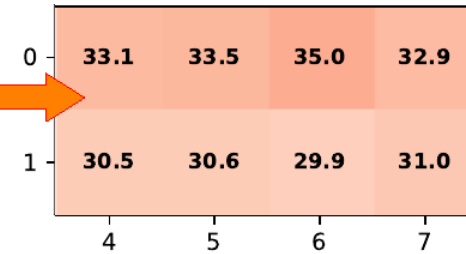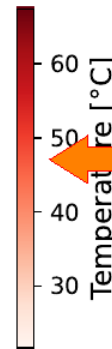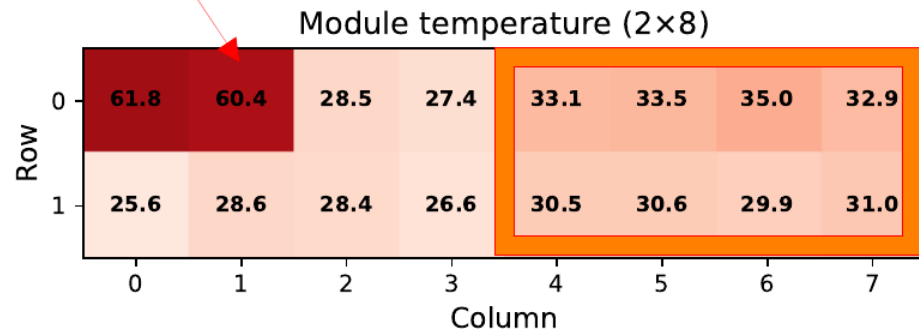
T probe from before

NTC board shows alike output as the T probe before

Module temperature (2×8)
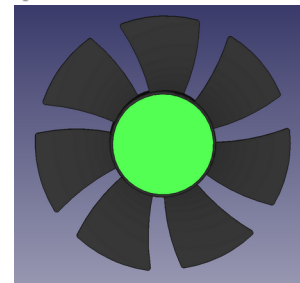
~ 12 m/s fan tip velocity

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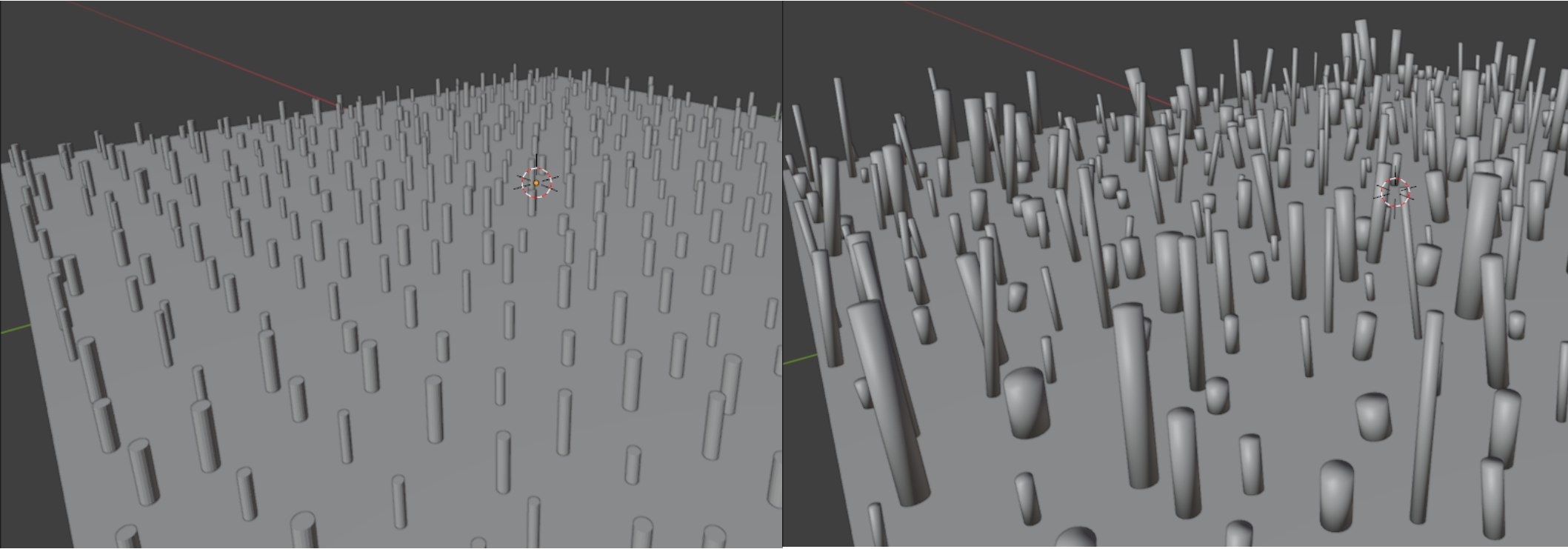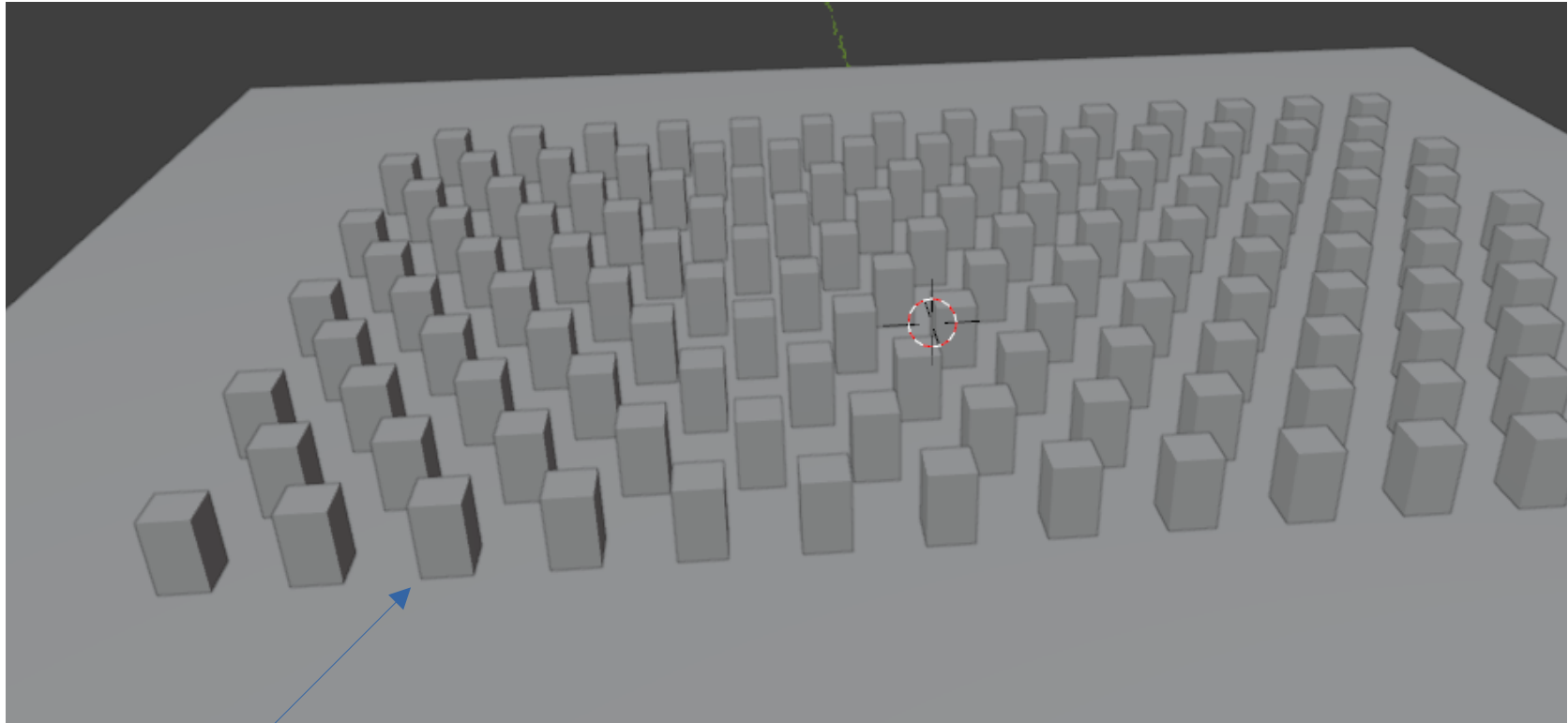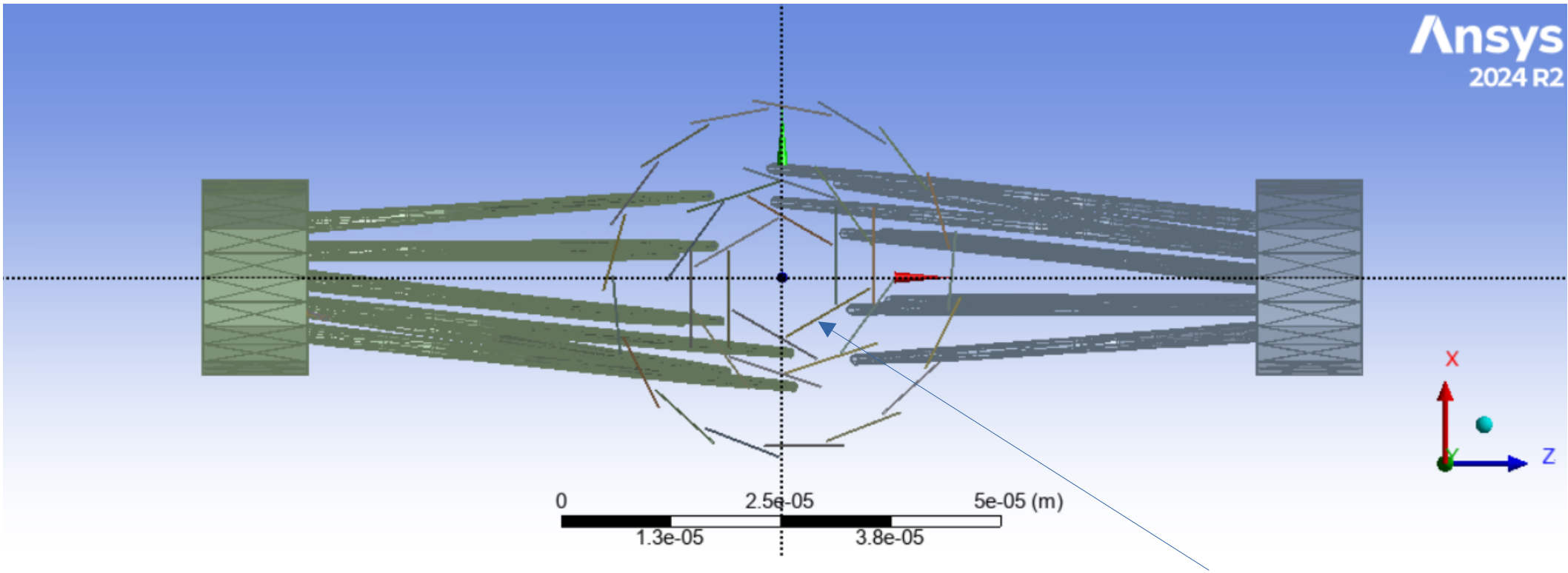# Pillars for increasing turbulence: some 3D models

Illustration of different pillar designs (arbitrary, not reproducible in real life).

Pillars for increasing turbulence: some 3D models

(Agreed with U.Bonn) rough estimate of pillar structure.

Pillar position depends on the detector arrangement

Dummy replication of Pixel Detector (relevant parts: 2 layers of All-Silicon modules).

Not sure (likely - not) if this setup is manageable to be run in Ansys, but it is useful for estimating the pillar geometrical requirements.
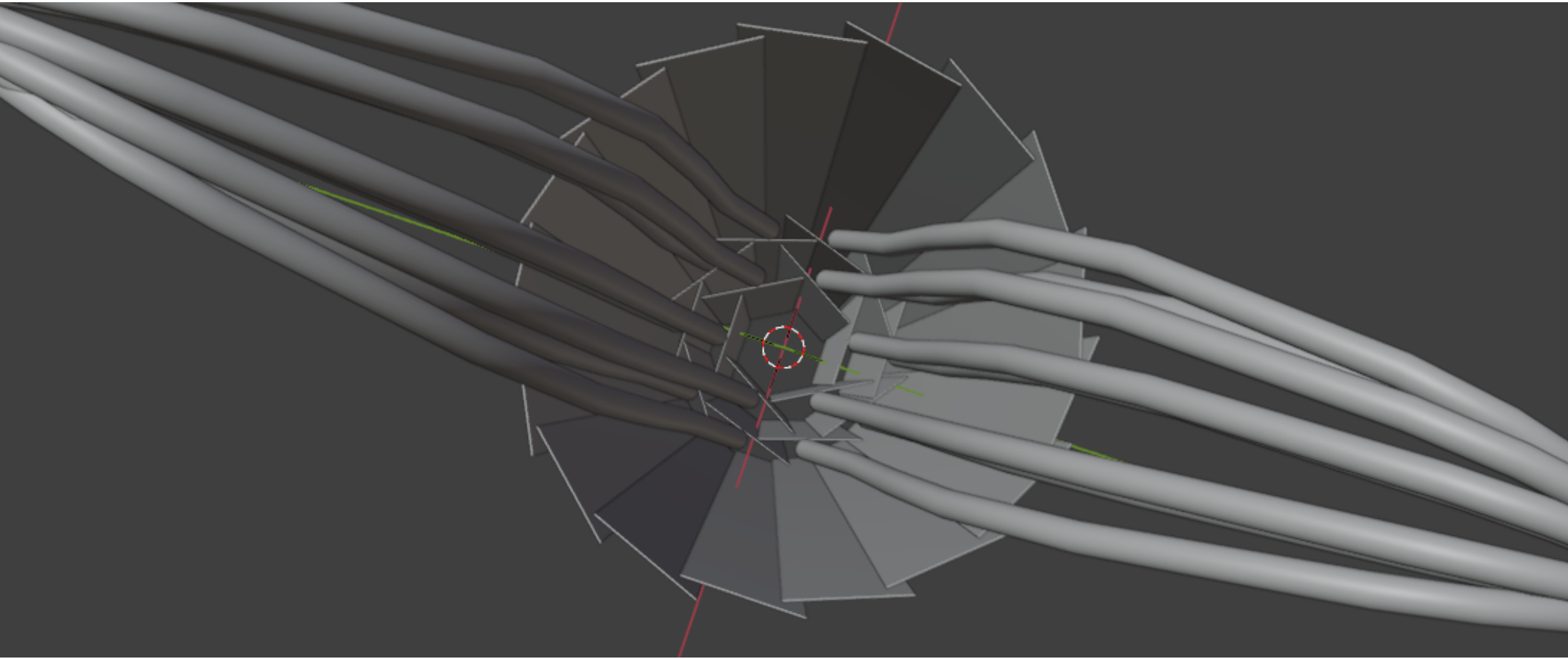
8

Detector arrangement: view from the side
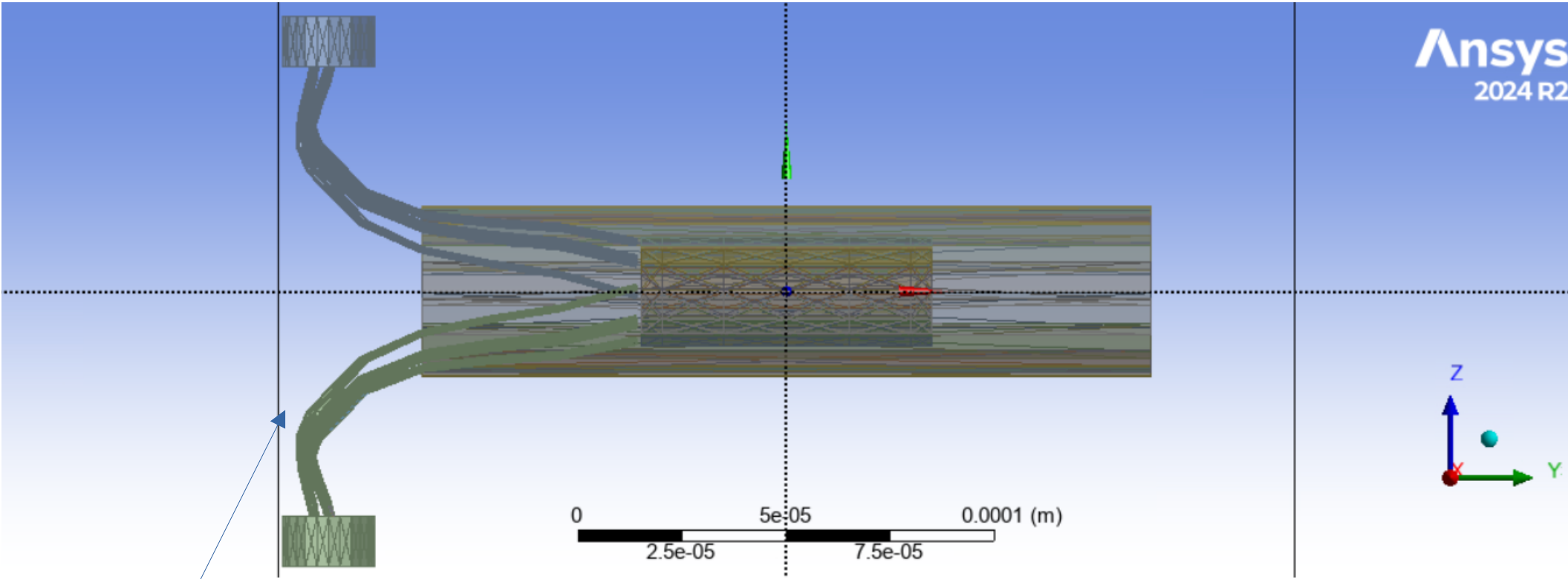
Power/cable connectors on the same side where the airflow setup is.

Ducts with their parameters help controlling the air (half of the setup is functional, half is not accepted by Ansys).

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Detector arrangement: view from the top

Duct ends arrangement and the pillars are interdependent.