Universität Siegen

HEP Experimental High Energy Physics

CPPS Center for Particle Physics Siegen

Bundesministerium für Forschung, Technologie und Raumfahrt

All-Silicon Meeting

Darshil Vagadiya
With E-lab

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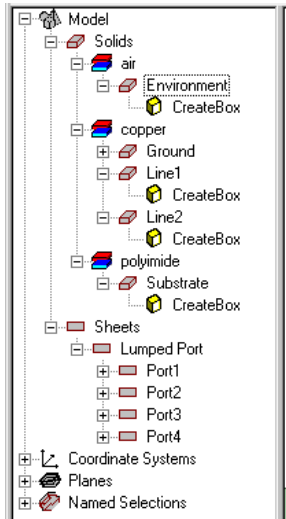
In collaboration with

UNIVERSITÄT BONN

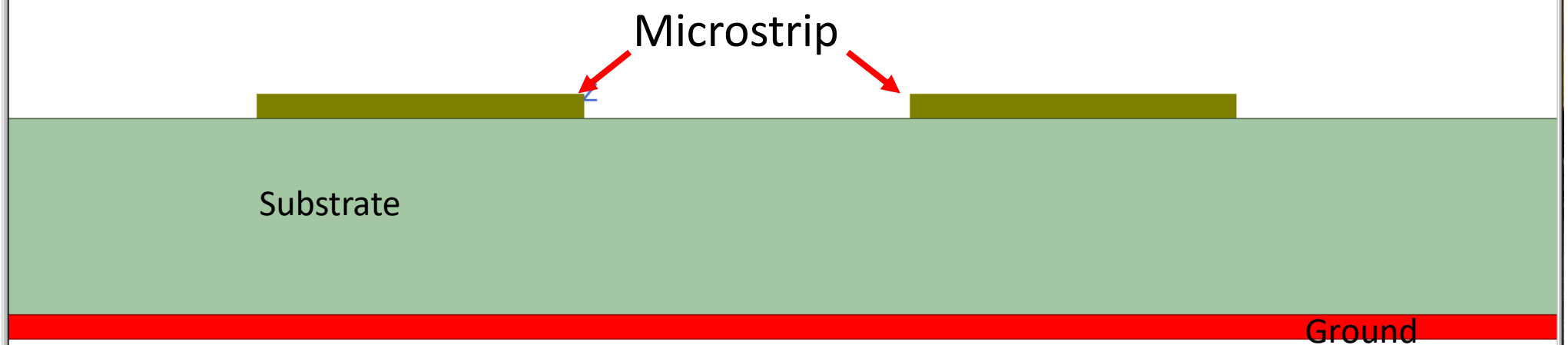
GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN IN PUBLICA COMMODA SEIT 1737

Ansys (HFSS) Simulations of the Surface Differential Line



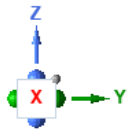
- **Both microstrip excited with 0.5 volts in each and in phase difference of 180deg.**

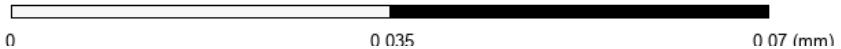
Ansys
2025 R2



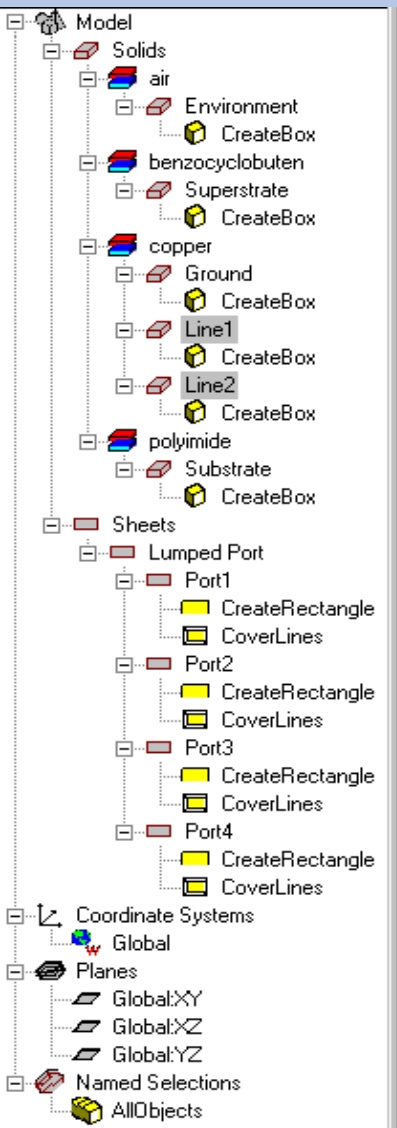
Microstrip Width: 40 µm
Microstrip length: 60 mm
Microstrip Height : 3 µm
Separation: 40 µm

Substrate Height: 24 µm
Differential mode Impedance: 100.07Ω
Common mode Impedance: 55.4Ω
Dielectric Constant: 3.5



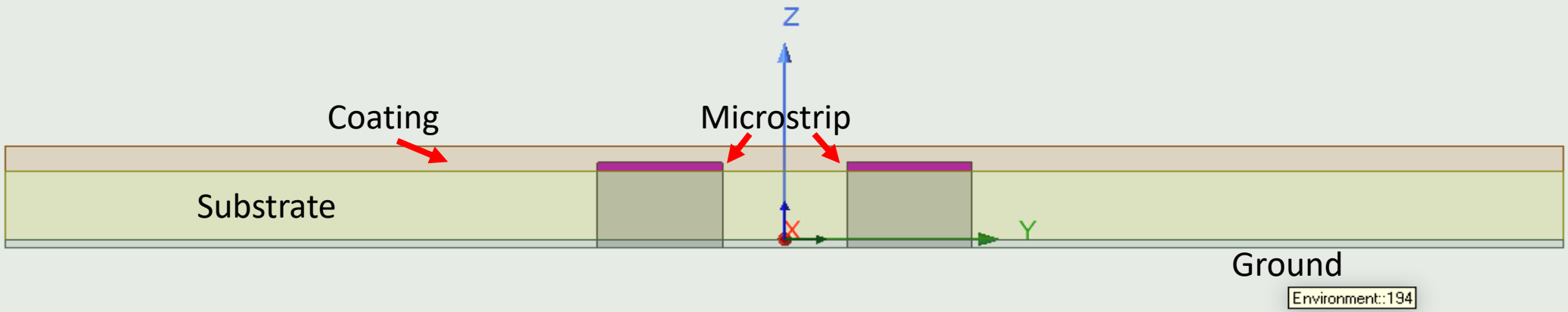


Ansys (HFSS) Simulations of the Coated Differential Line



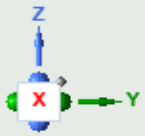
Ansys
2025 R2

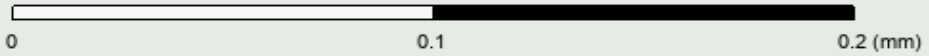
- **Both microstrip excited with 0.5 volts in each and in phase difference of 180deg.**



Microstrip Width: 40 µm
Microstrip length: 60 mm
Microstrip Height : 3 µm
Separation: 40 µm
Substrate Height: 24 µm

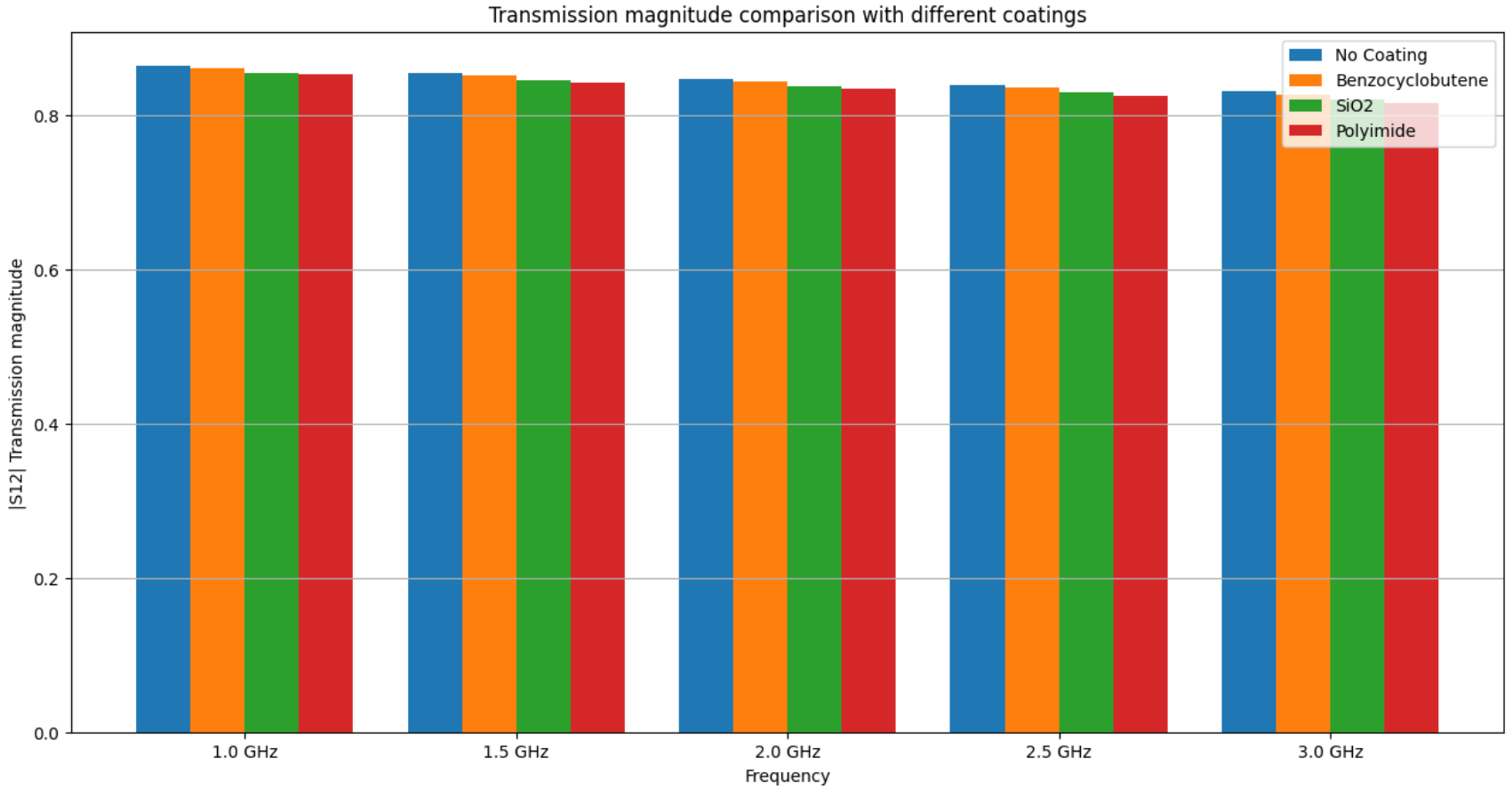
Coating material: Polyimide
Coating height: 9 µm
Effective coating height: 6 µm
Differential mode Impedance: 95Ω
Dielectric Constant: 3.5





Results of Ansys Simulations of the Coated SDL

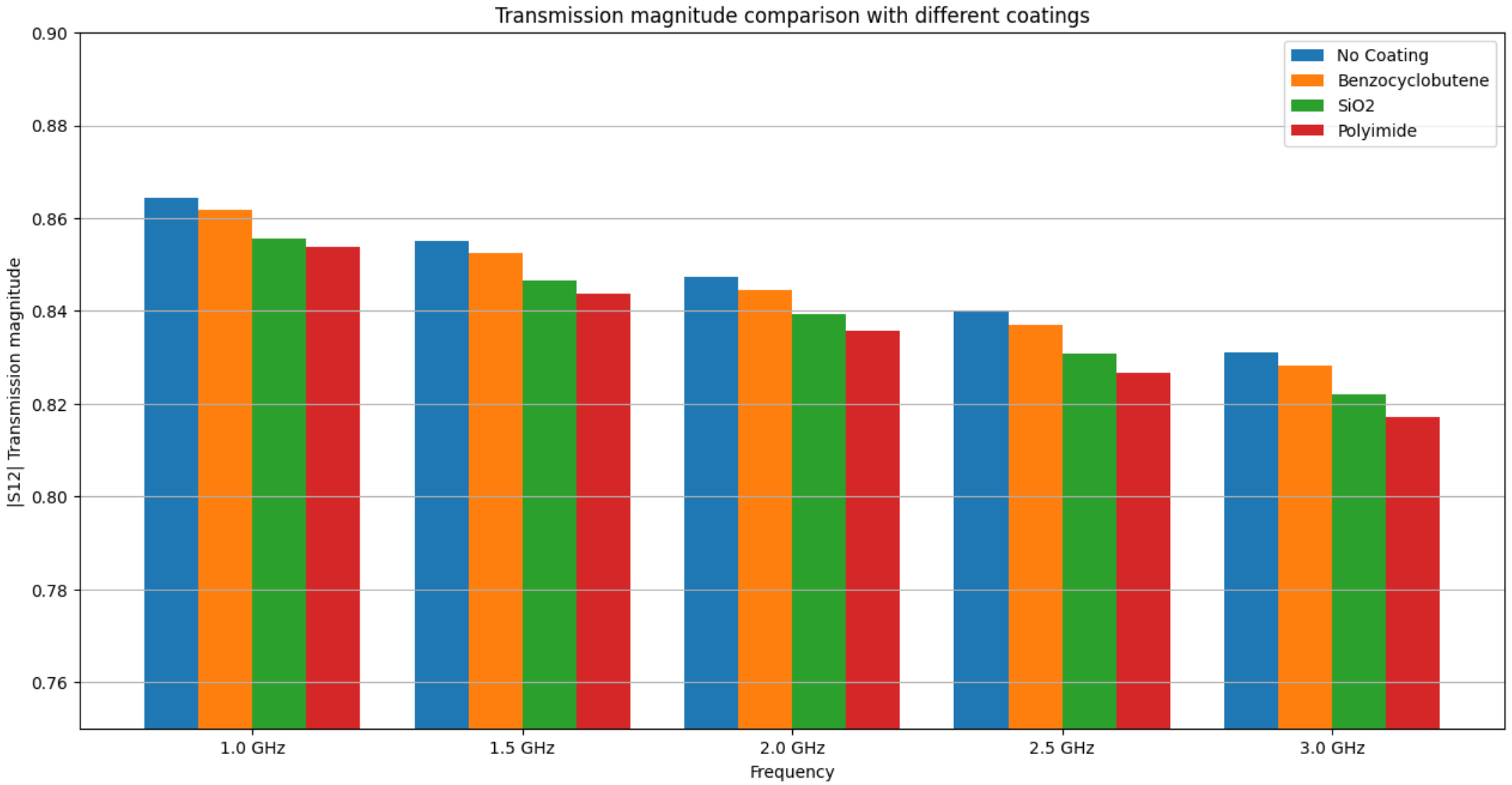
Study of the transmission magnitude as a function of the coating height



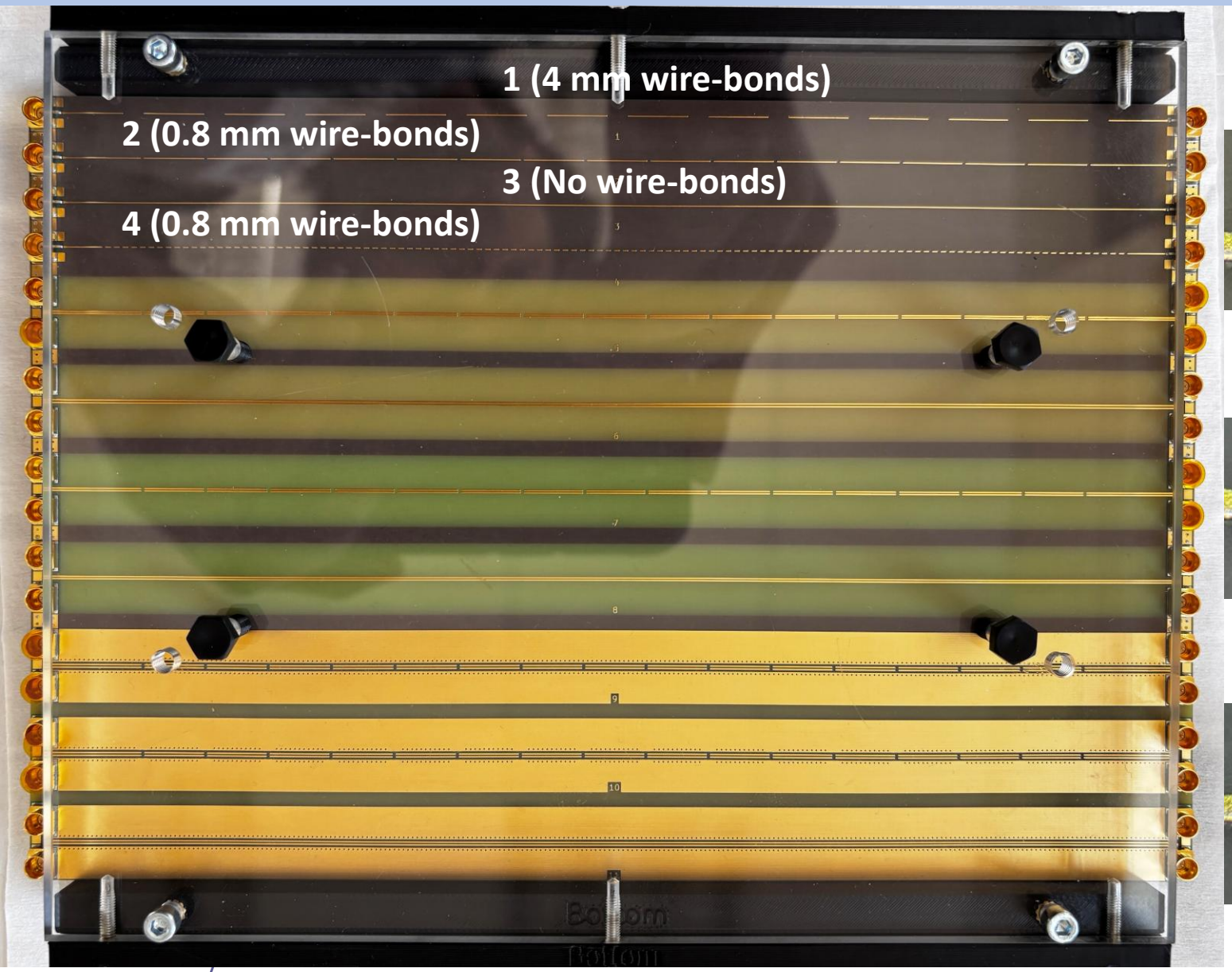
- 3 different coating materials are used.
- In this plot, coating thickness is 7 µm from the substrate height.

Results of Ansys simulations of the coated SDL

Study of the transmission magnitude as a function of the coating height



Wire-bonding on Test PCB



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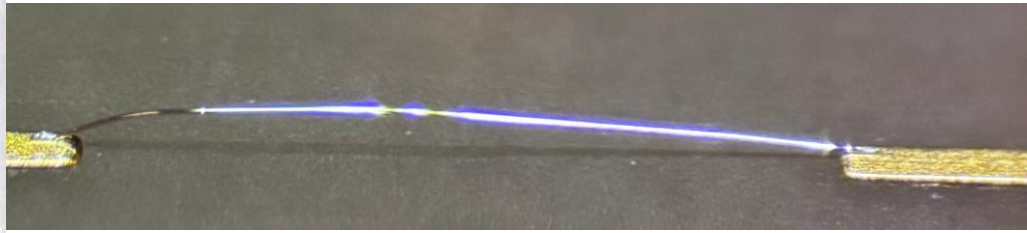

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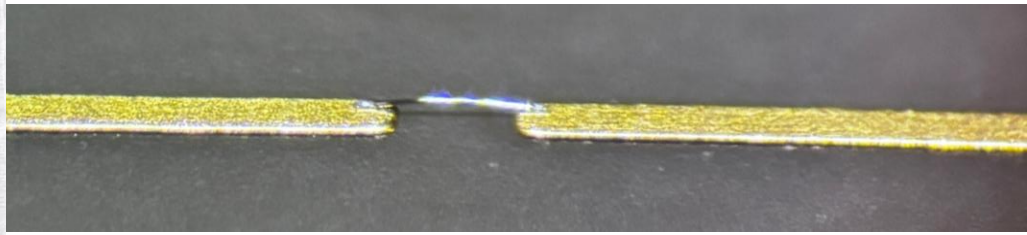

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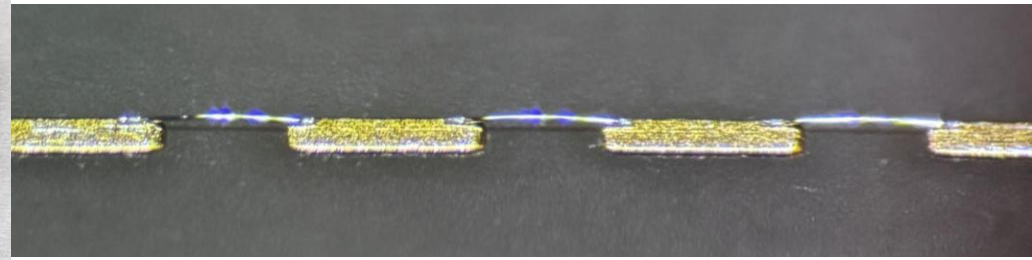

Questions :

- In the IZM structure, what is the reference plane (Ground) for differential lines and Vias?
- Structure of Vias?

Next steps :

- Simulations of vias is in progress; till now, I have not gotten any satisfactory results.
- TDR measurements of wire-bonded lines.