Universität Siegen

HEP Experimental High Energy Physics

CPPS Center for Particle Physics Siegen

All-silicon Meeting

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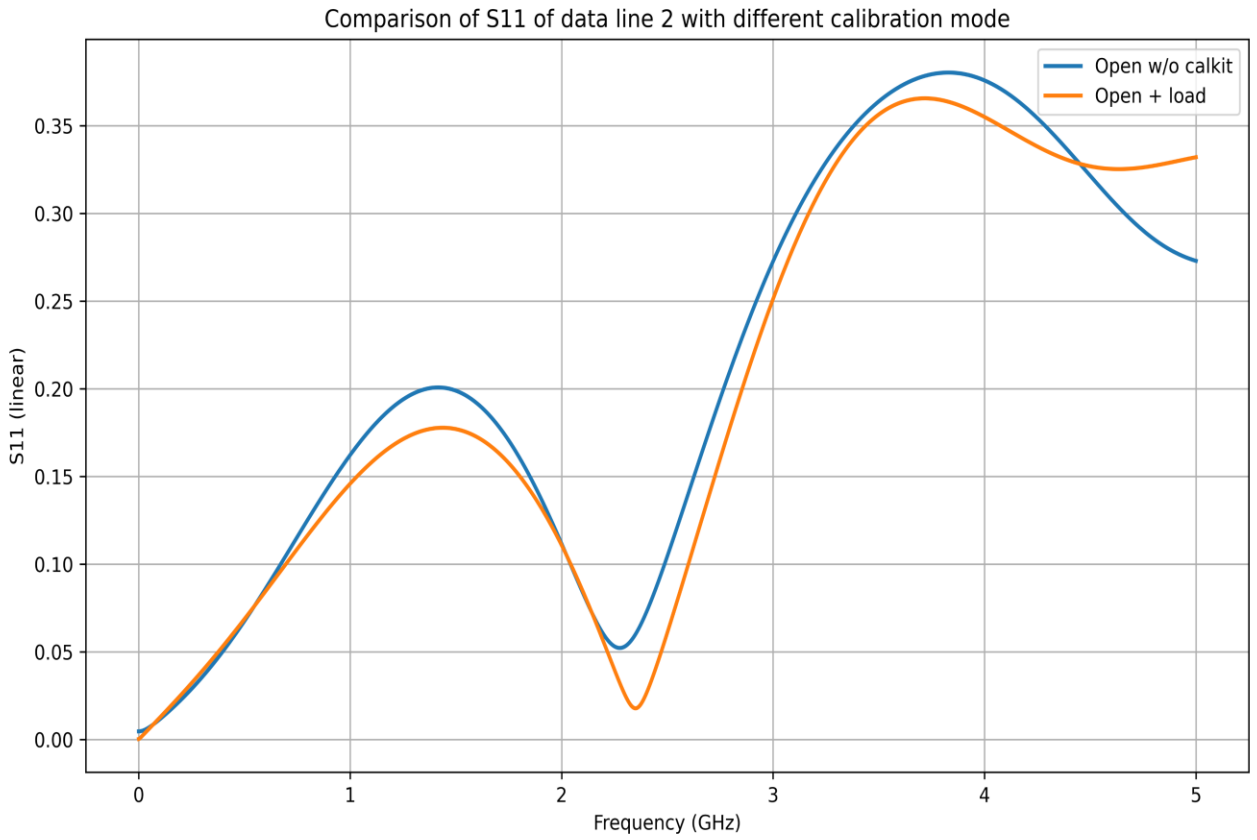
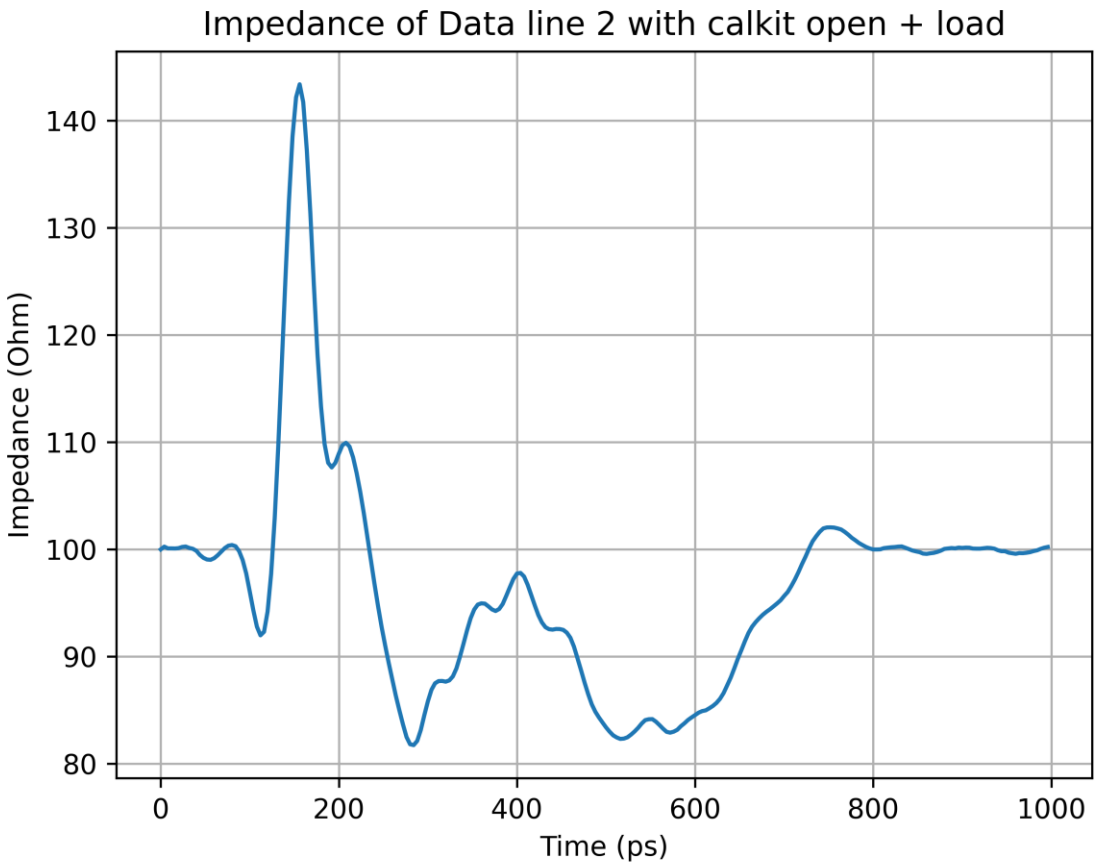
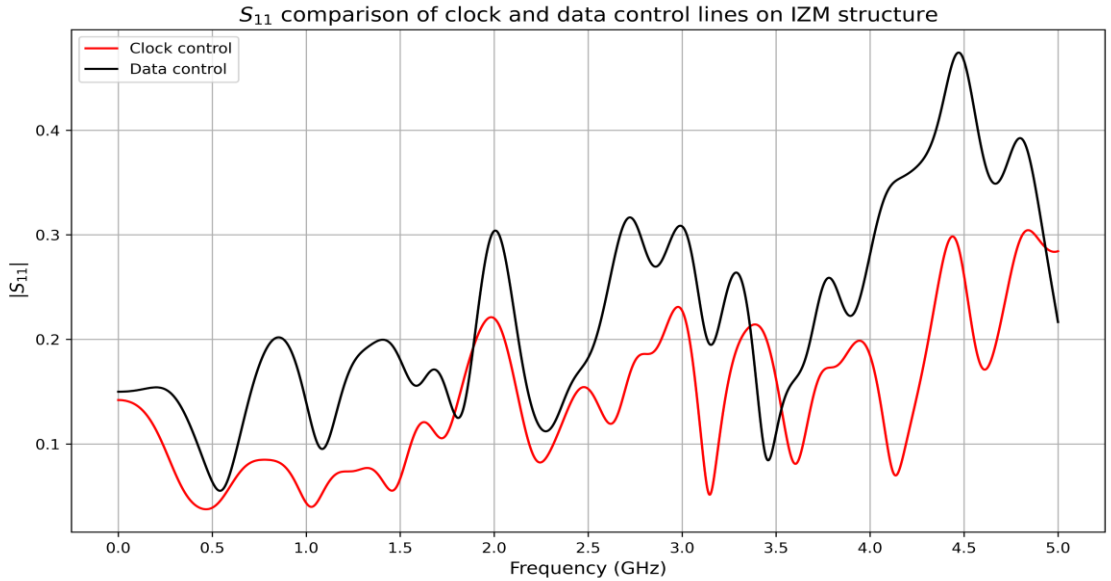
Results of the TDR measurements of IZM structure

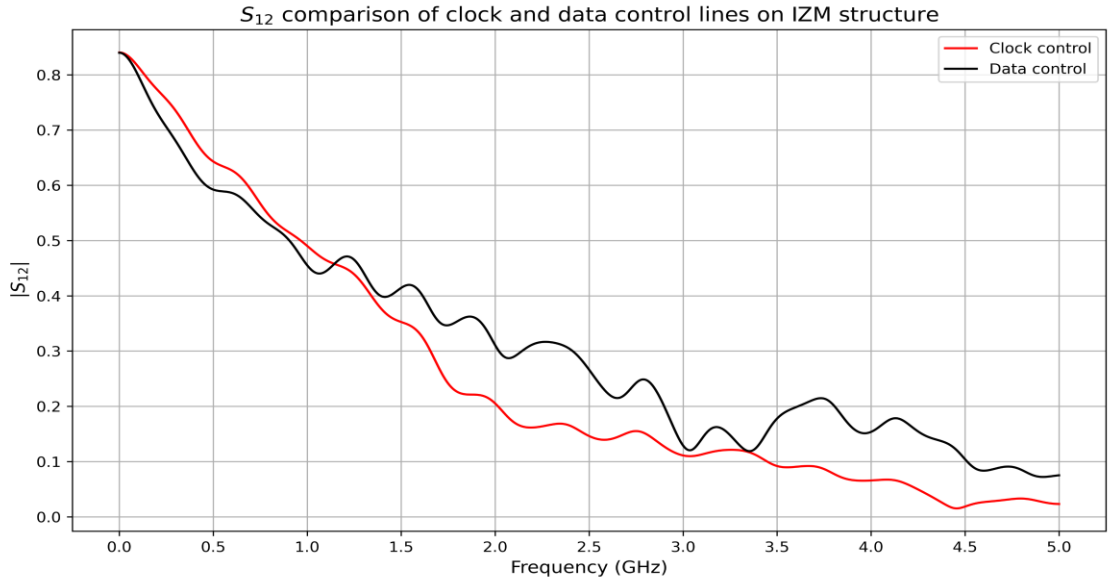


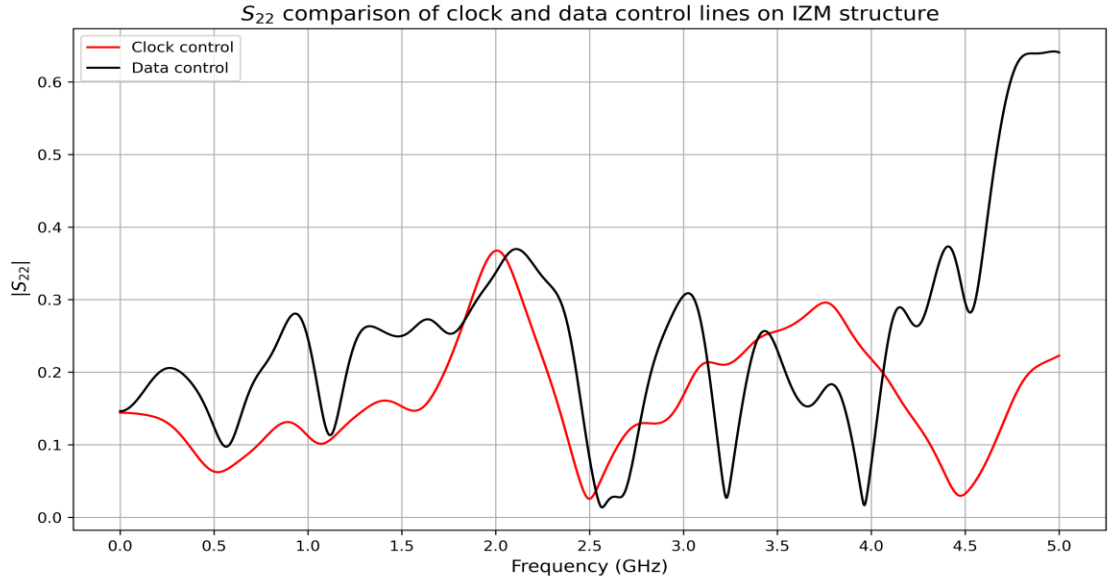


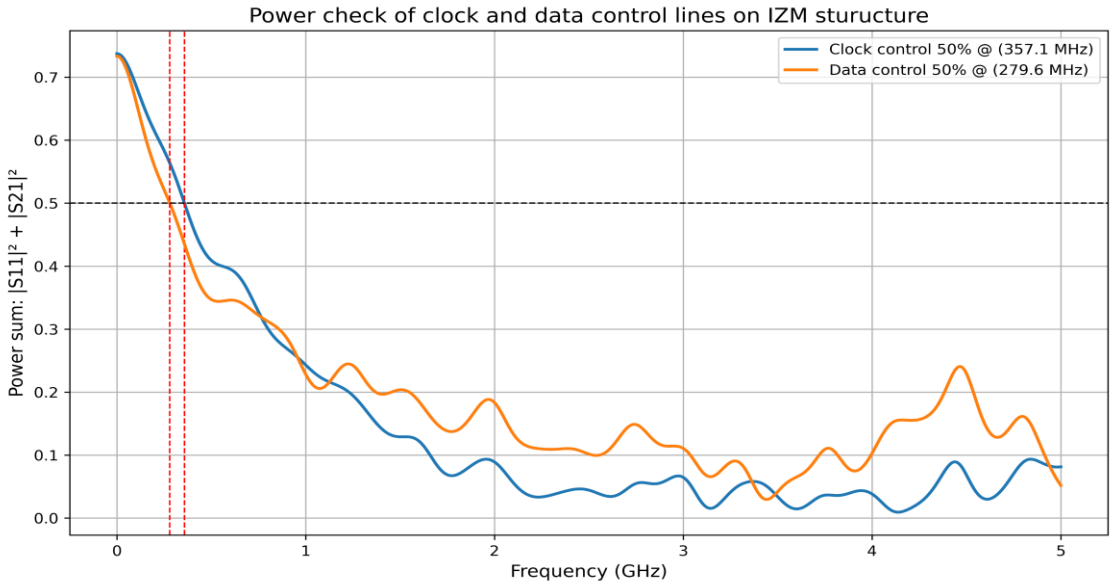
- Measurements were done in the freq. range from 0-5 GHz in a step size of 1,67 MHz with 250 samples
- Reference impedance for the differential line is 100 Ω
- Done with (open + load) and without calibration kits

Results of the TDR measurements of IZM structure









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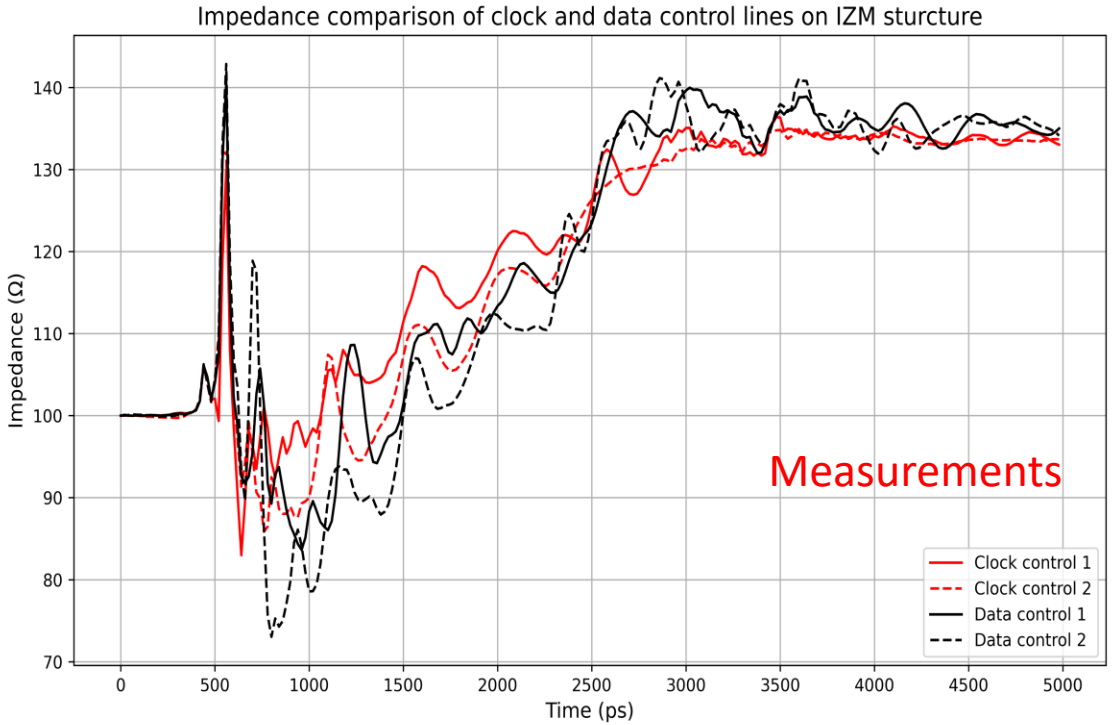
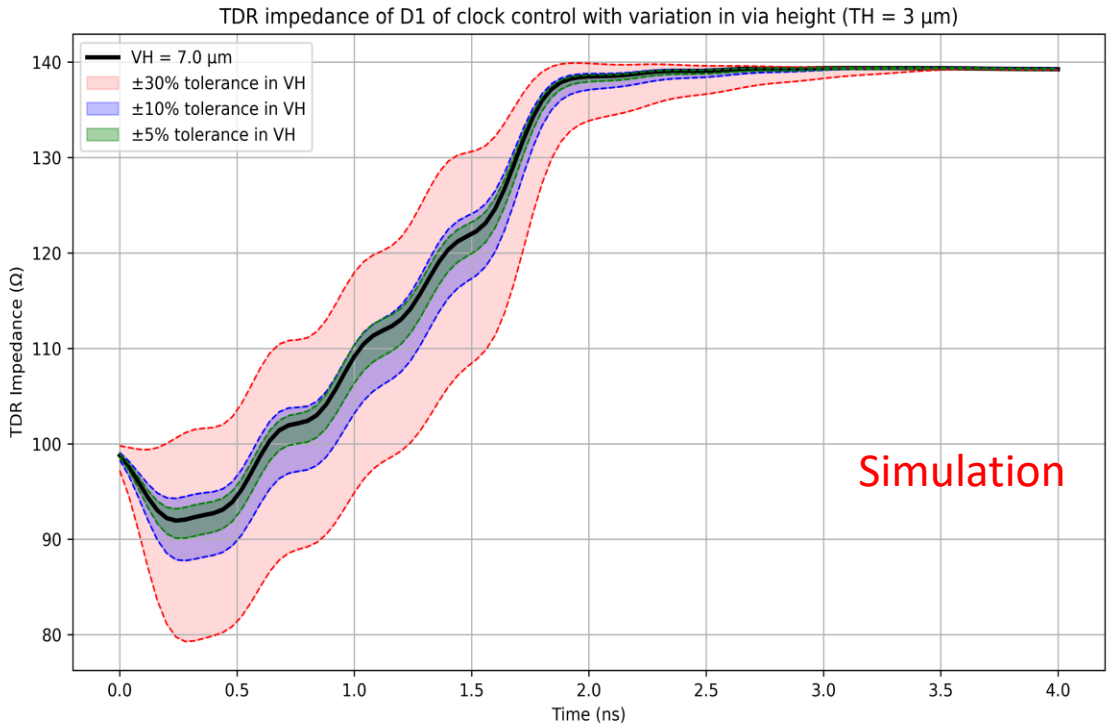




- The plateau in the impedance plot is given by

$$\text{Plateau} = \text{reference Z} + 2 * \text{Ohmic resistance (R)}$$

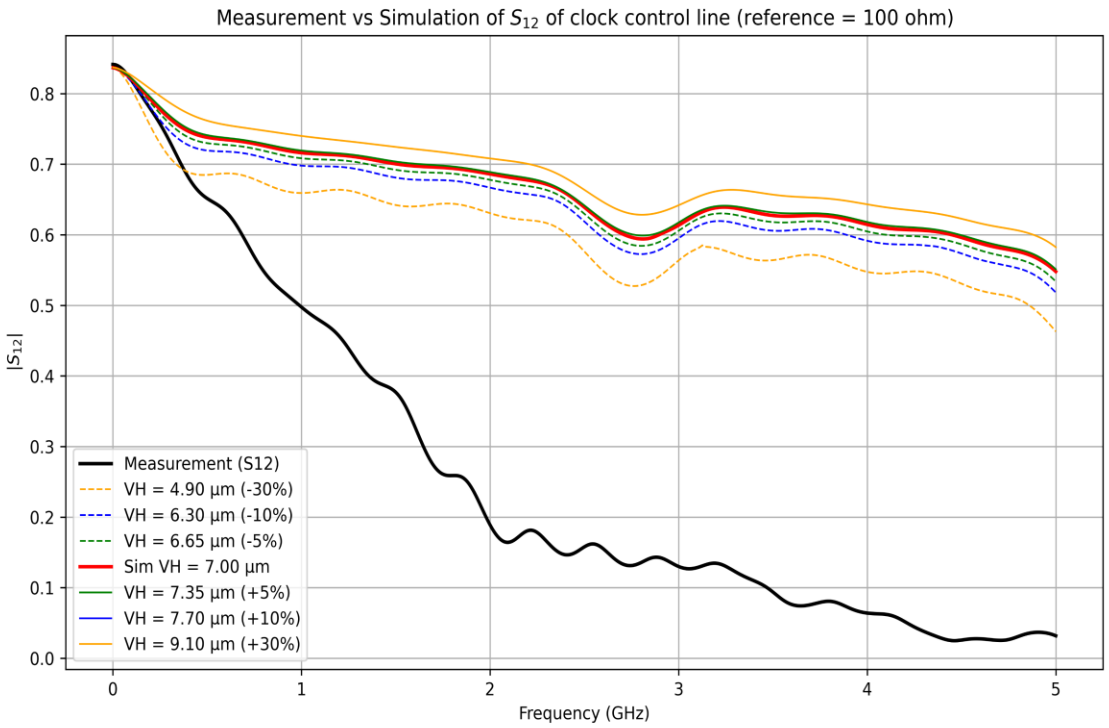
$$135 = 100 + 2 * R$$

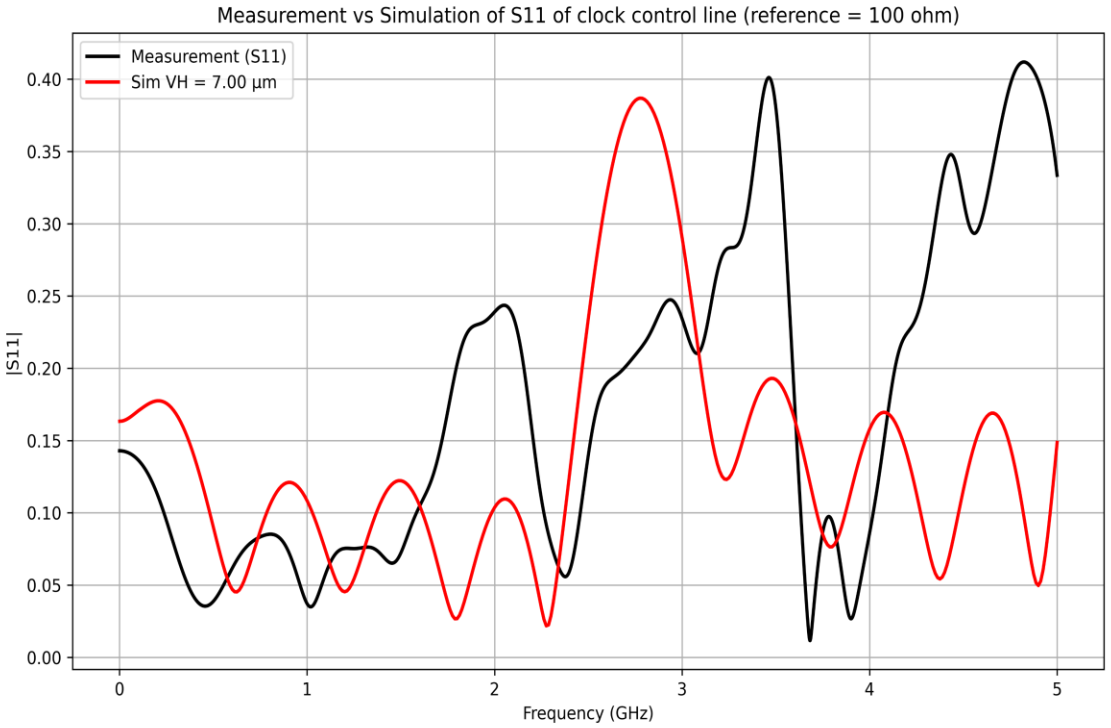
$$R = 17.5\ \Omega$$

- Ohmic resistance of the clock control line from the previous measurement $\cong 19\ \Omega$
- This can be realised in both simulations and measurements.

http://www.electrical-integrity.com/Paper_download_files/DC13_Determining_PCB_Trace_Impedance.pdf

Comparison of simulations and measurements





- Simulations have a higher transmission magnitude than that of the simulations, suggesting higher power loss in the current structure
- Whereas the reflection magnitude is in a comparable range, by improving the simulation model, it may also be improved
- Both simulations and measurements have the same reference impedance of 100 Ω

Next steps :

- Simulations of the IZM structure with tolerance in trace height and via height are in progress for all lines