5G/6G dual-band liquid metal-based mm-wave reconfigurable phase shifter

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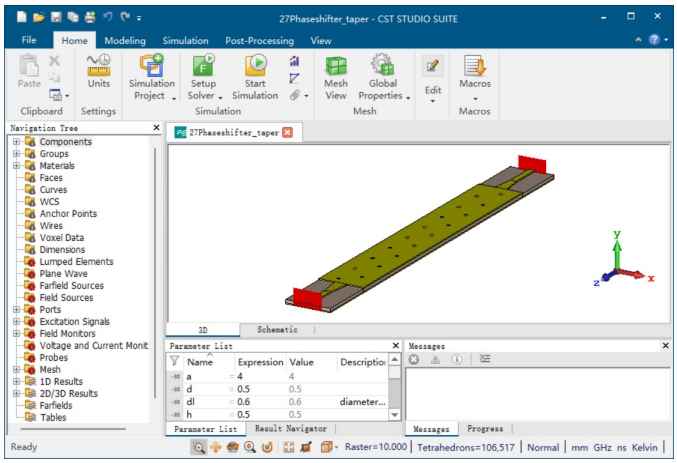
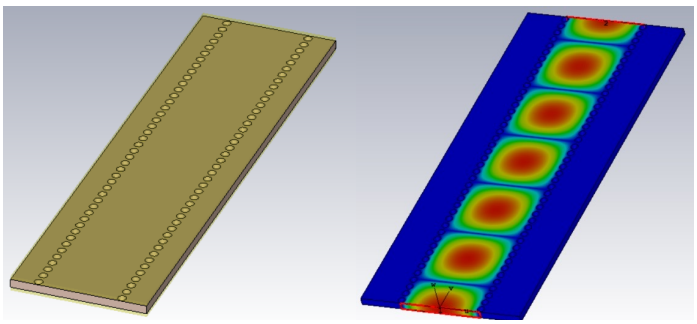
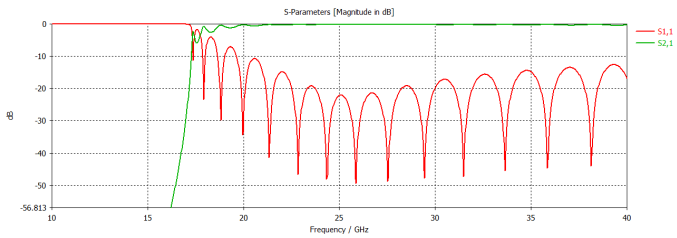
CST Microwave Studio

- CST Microwave Studio specializes in providing a fast and accurate 3D electromagnetic simulation of high-frequency problems.
- I design and simulate the microwave device using the software, which is a very powerful tool to help me understand the physical phenomenon and optimize the designs.







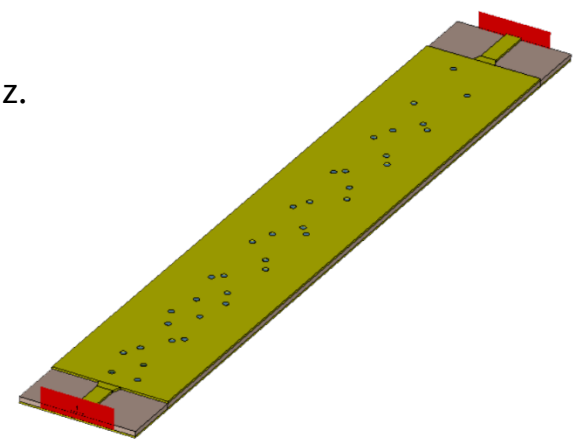
Apply the Microwave Theory

- Designing the microwave devices is the high time for me to test out my understanding of electro-magnetic wave theory. However, theory may not solve every problem, flexible use of engineering methods is also vital in solving those problems
- When facing great difficulties, it is always a good idea to discuss it with my mentor. Our weekly meeting helped me overcome many obstacles.

Notable Outcomes

- Put forward and demonstrated the design process of dual-band liquid-metal based merged phase shifter working at 27 and 38 GHz.
- Given possible merge solution for different scenario.

Mode	27GHz mode	38GHz mode
Number of via	18	18
Phase change range	0~354.5°	0~347.6°
Average phase increment	19.7°	19.3°
Average insertion loss	1.688dB	2.264dB
Maximum insertion loss	1.922dB	2.631dB
Average return loss	16.6dB	17.7dB
Minimum return loss	10.2dB	11.6dB



Merged dual-band phase shifter