Experiment-2

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Title: Study of power divider (H-plane TEE)

Objectives:

- Study port signal.
- Study propagation delay.
- Study power flow.
- Study E-filed and H-field propagation.

Platform: Dassasualt Systems' Computer Simulation Technology (CST)

H-Plane Tee:

• Cutoff Frequency Band: 10 GHz to 15 GHz

• MWG (22mm * 12mm * 100mm)

• CWG (20mm*10mm*100mm)

• HW (30mm*12mm*22mm)

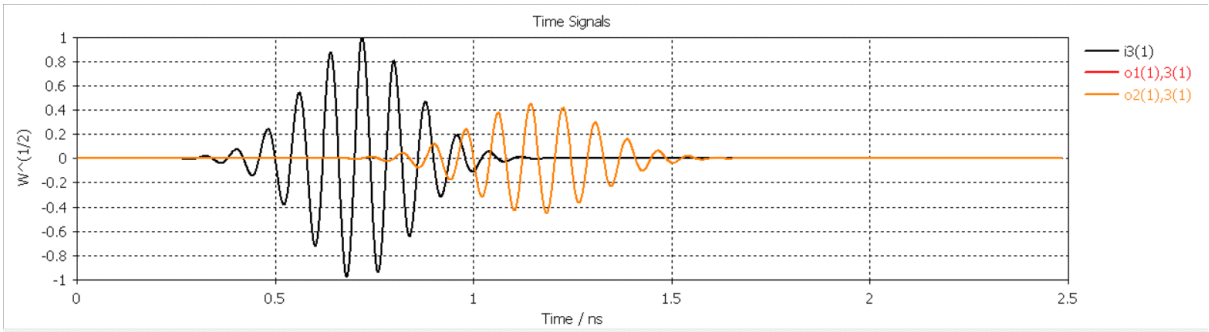
• Material: Copper (pure)

Procedure:

First construct a Tee-shaped waveguide on CST platform considering the appropriate dimension according to the frequency of operation and material and then run the simulator.

Results:

1. Fig (a). Port Signal

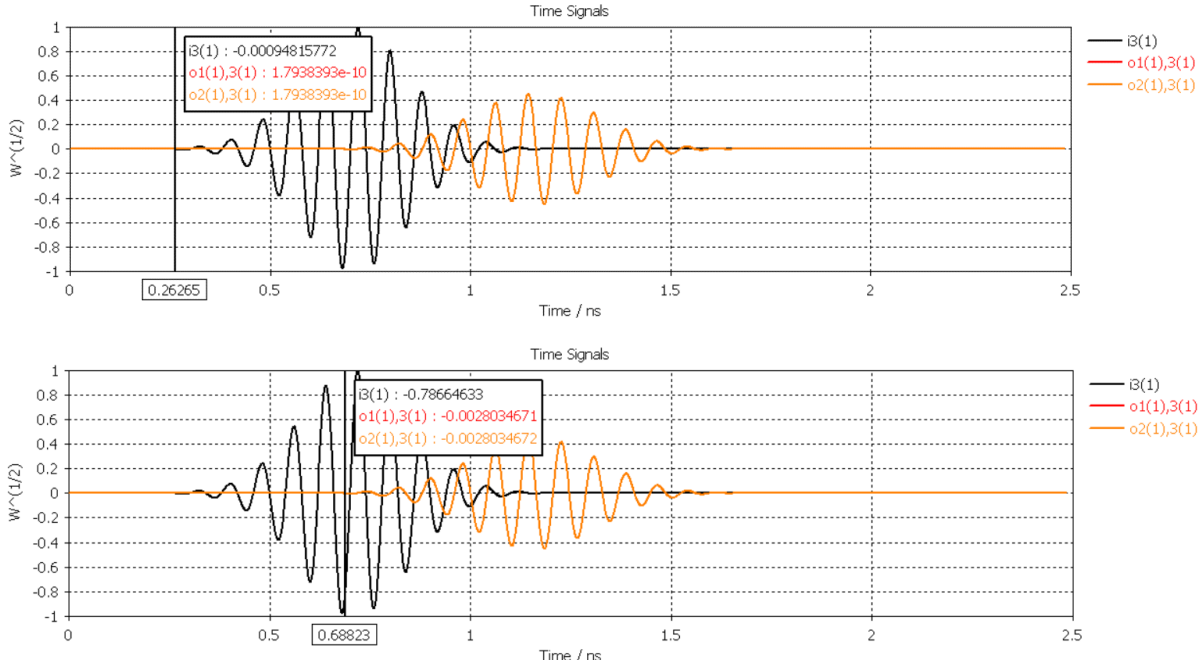


Observations:

- Output at port 1 and 2 are identical.
- The output power is halved at the two ports.

This shows that the voltage divider is working.

2. The propagation delay can be calculated by:



T(delay) = 0.68823 – 0.26265 = 0.42568 ns

3. Power Flow

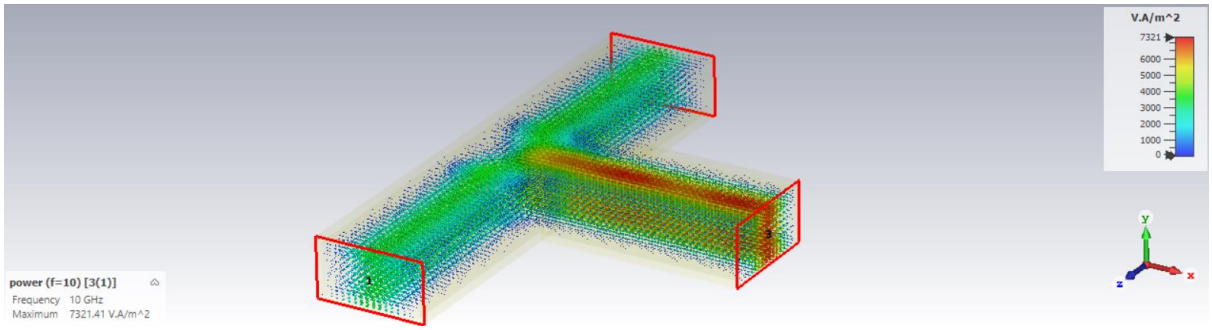
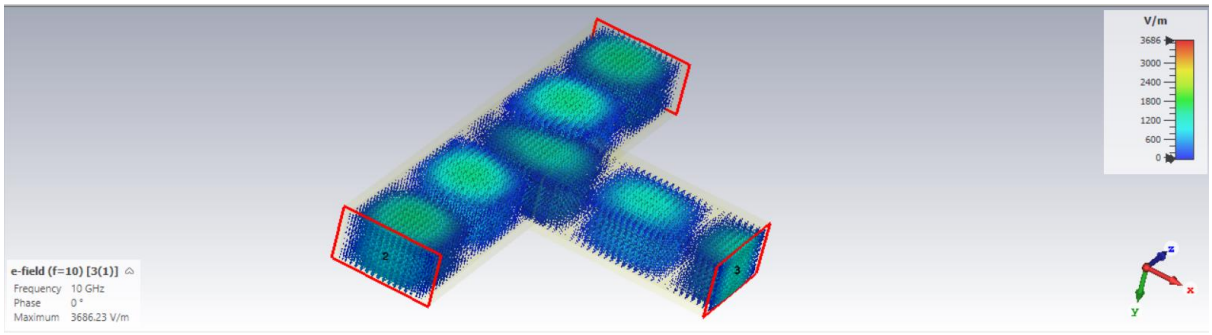


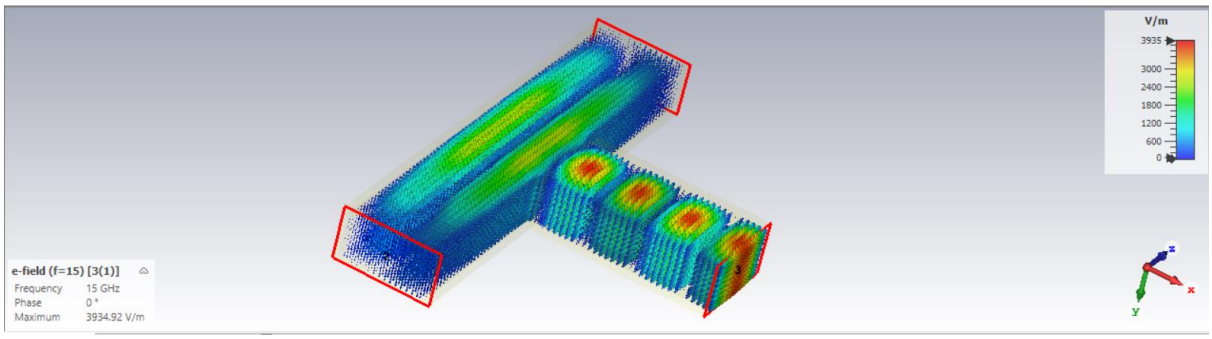
Fig (b). Power Flow at f = 10 GHz from port 3

We can see that the power is equally divide to the ports 1 and 2 from port 3.

4. E-field propagation

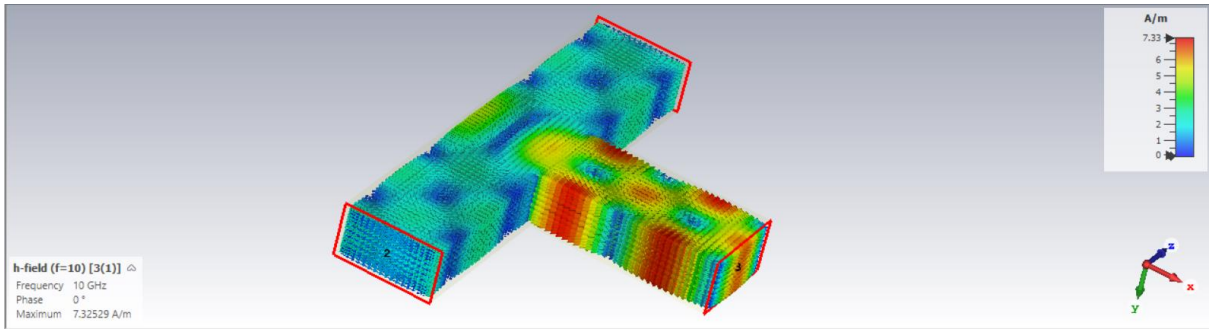


Fig(c) Electric field at f = 10 GHz [3(1)]

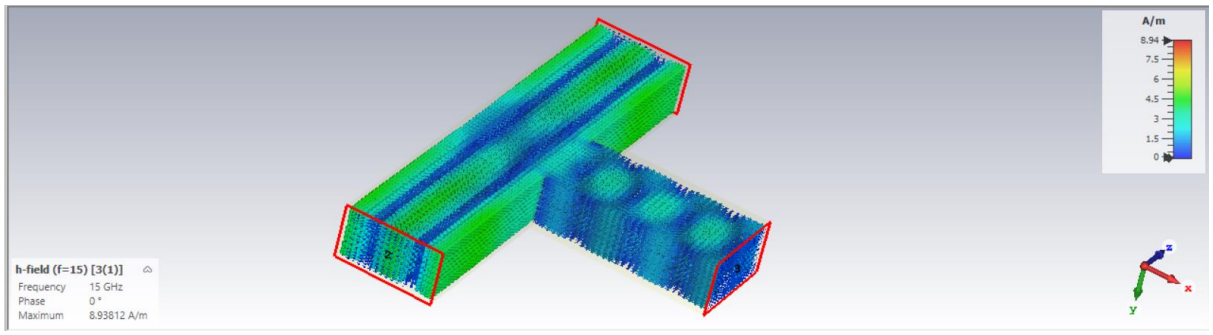


Fig(d) Electric field at f = 15 GHz [3(1)]

5. H-field propagation



Fig(f) Magnetic field at f = 10 GHz [3(1)]



Fig(g) Electric field at f = 15 GHz [3(1)]