



INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,  
DESIGN AND MANUFACTURING,  
KANCHEEPURAM

## **RFMCD LAB-6 PRACTICE**

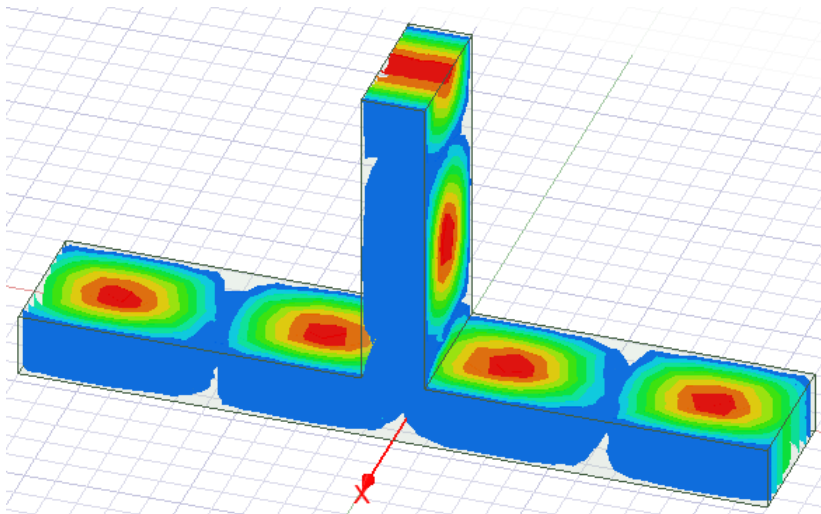
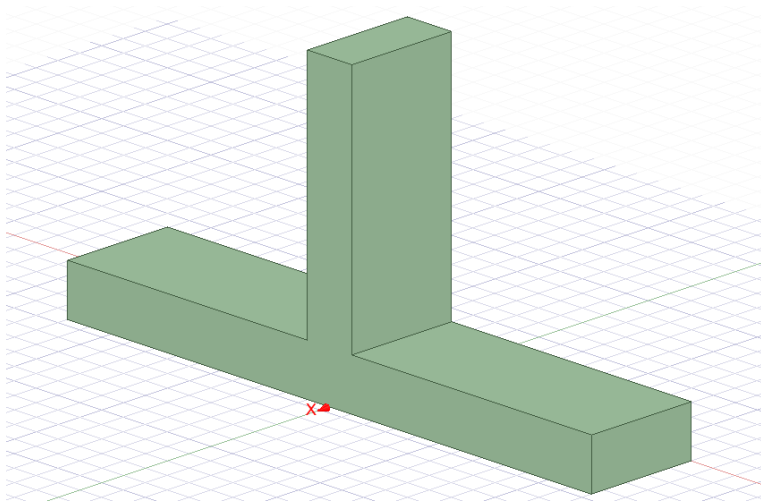
**NITESH**  
**ESD19I008**

### **DESIGN & ANALYSIS OF WAVEGUIDE TEES**

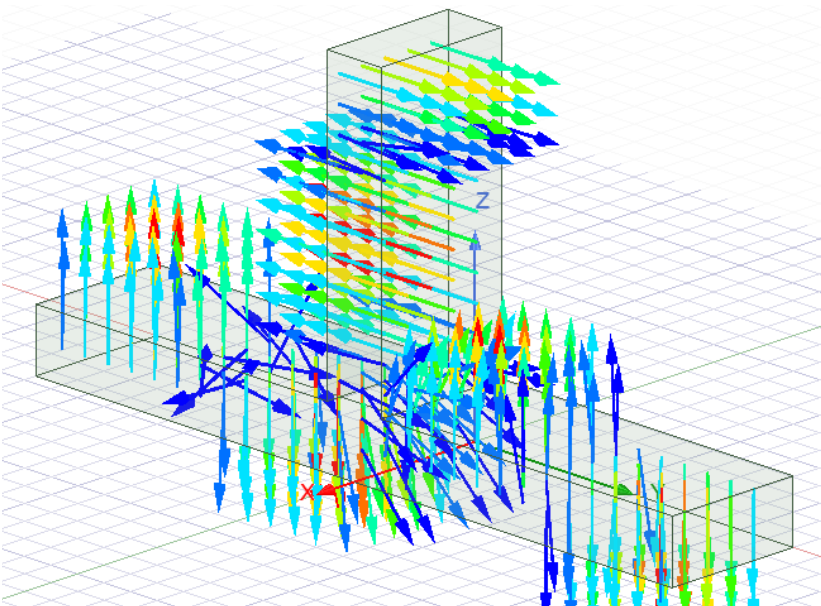
**Aim:** To observe signal propagation in x band rectangular waveguide tee.

**Tools required :** Ansys electromagnetic desktop

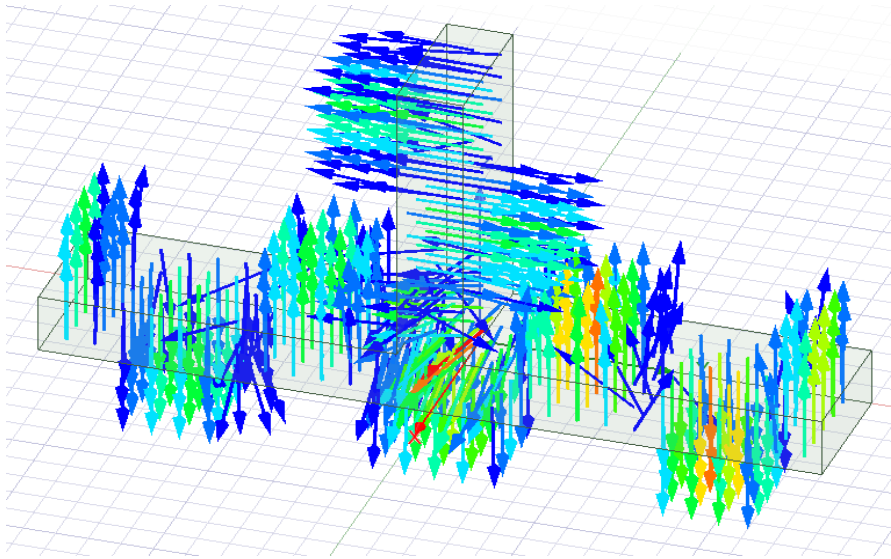
## E plane Tee :



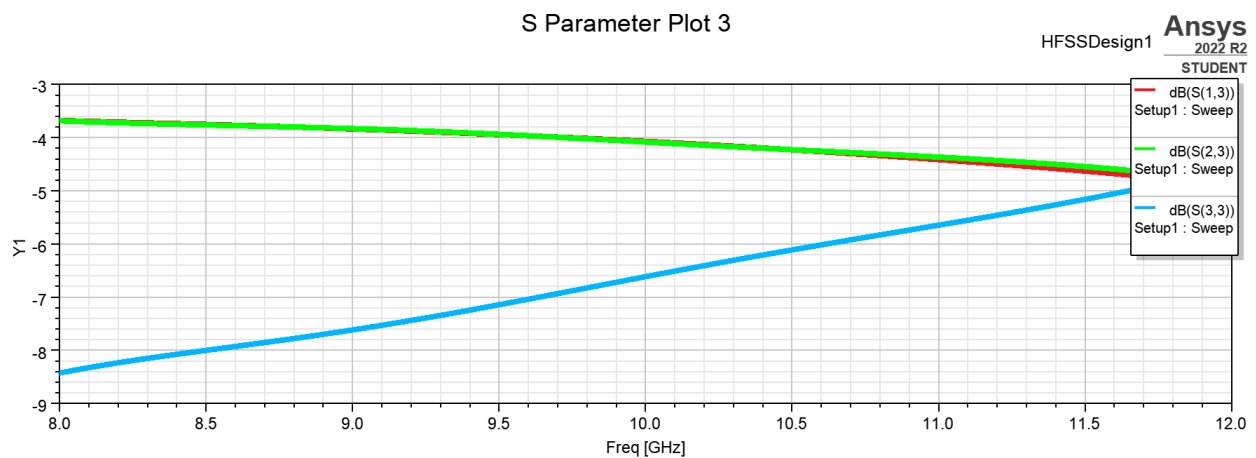
## Port 3 excited:



### Port 1 excited:



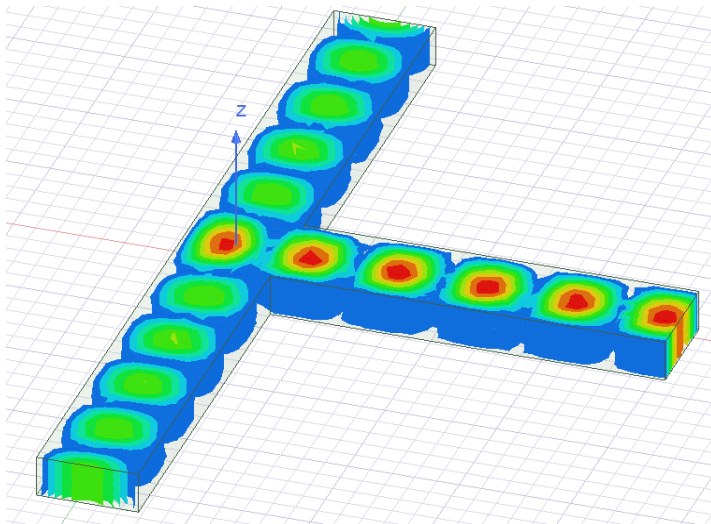
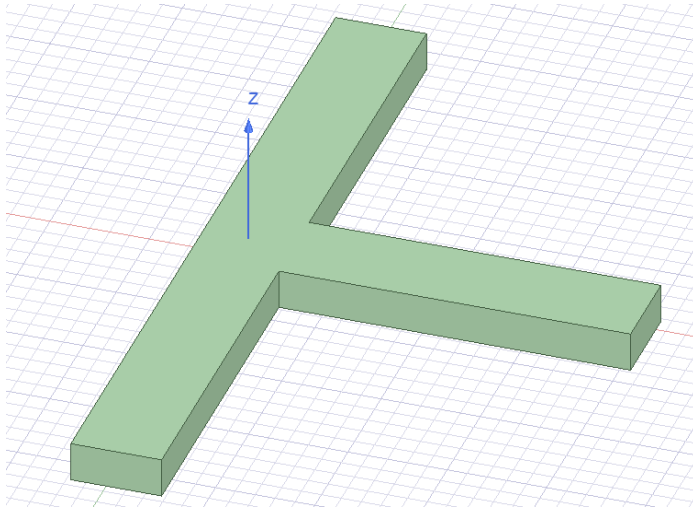
### S parameter plot:



### Inference:

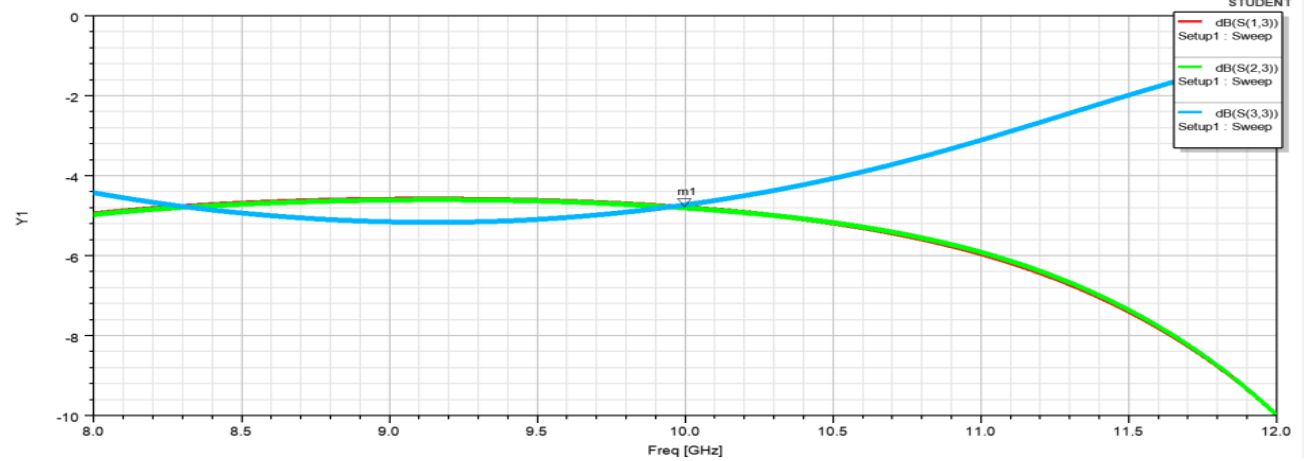
- When port 3 is excited, the magnitude of power is almost the same between port 1 and 2.
- When we look at the graph we can see that S23 and S13 are almost equal which means that the power going through ports 1 and 2 are the same.
- The phase of the power going through port 1 and port 2 are inverted.

## H Plane Tee:

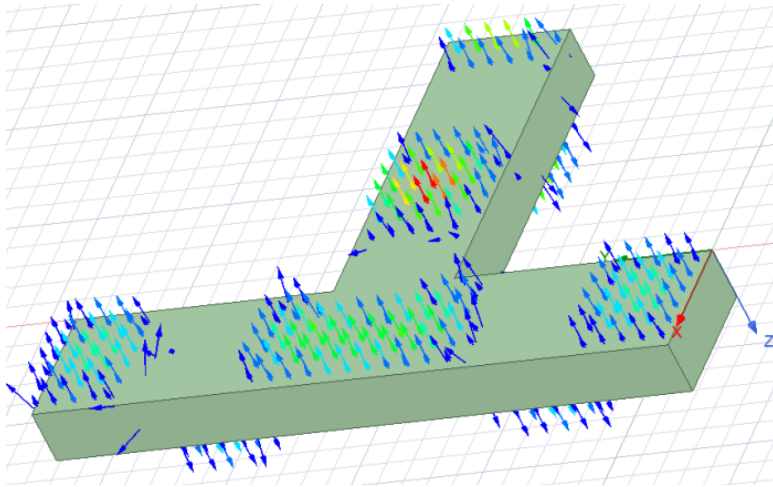


Name	X [GHz]	Y
m1	10.0000	-4.8002

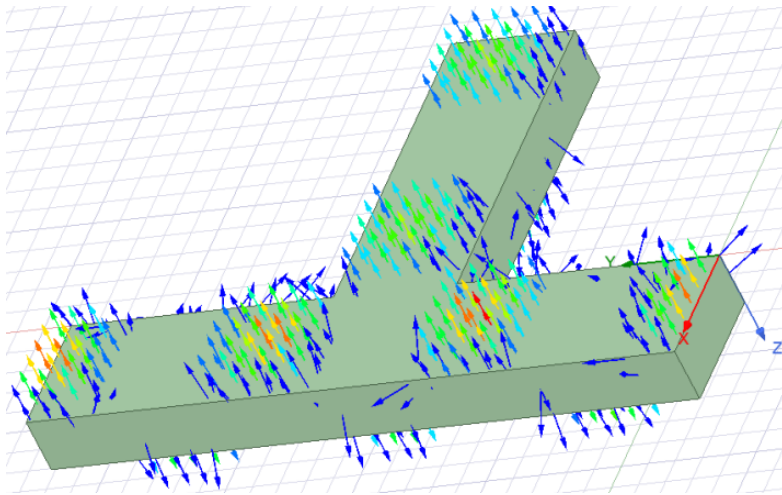
S Parameter Plot 1



### Port 3 excited:



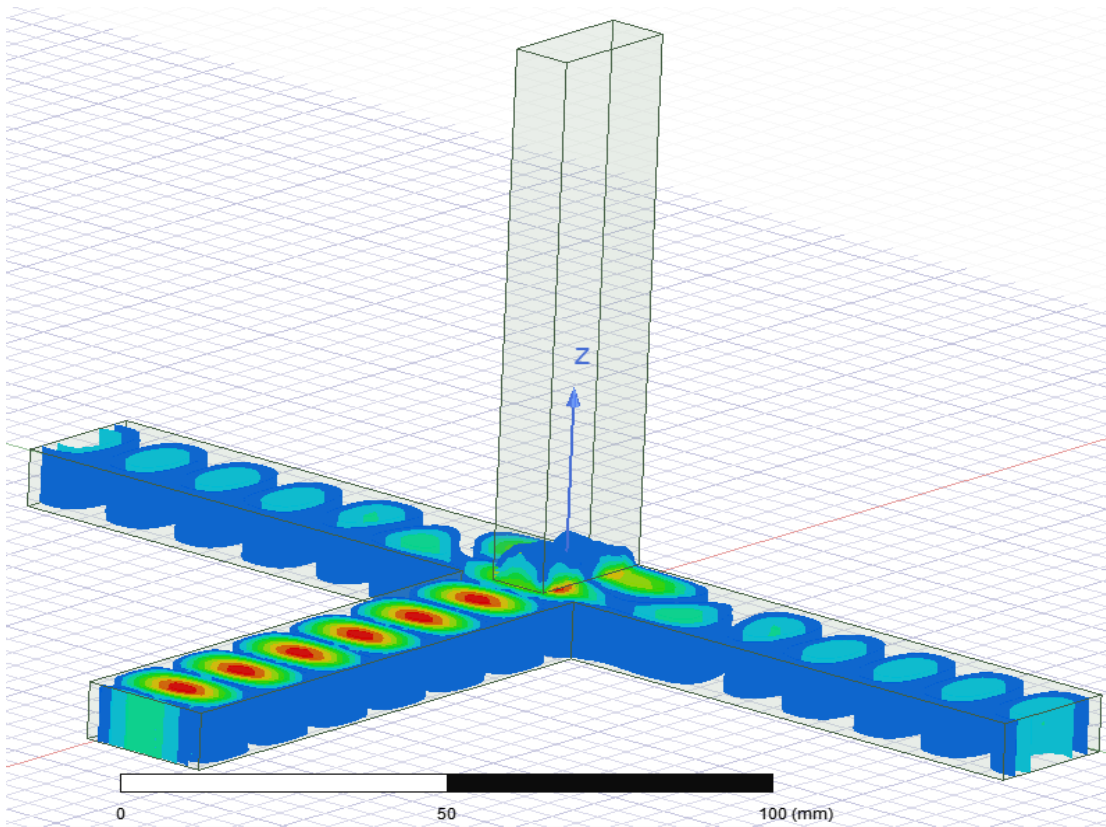
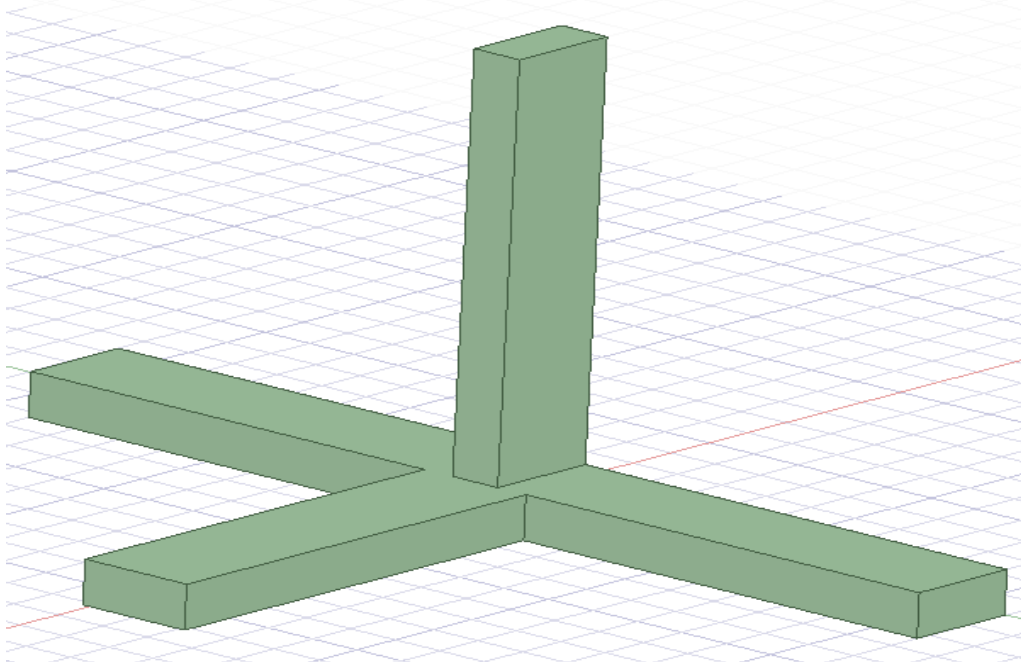
### Port 1 excited:



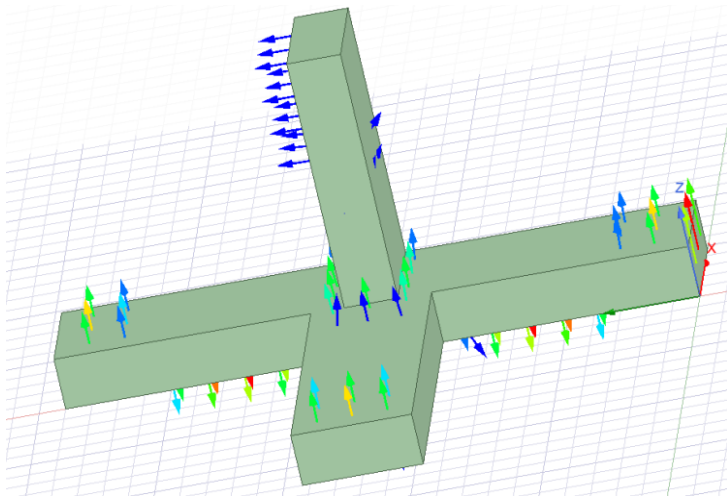
### Interference:

- Phase of power going through port 1 and port 2 are the same.
- When we look at the vector model, we can see that the magnitudes of the power going through ports 1 and 2, when port 3 is excited, are almost the same.

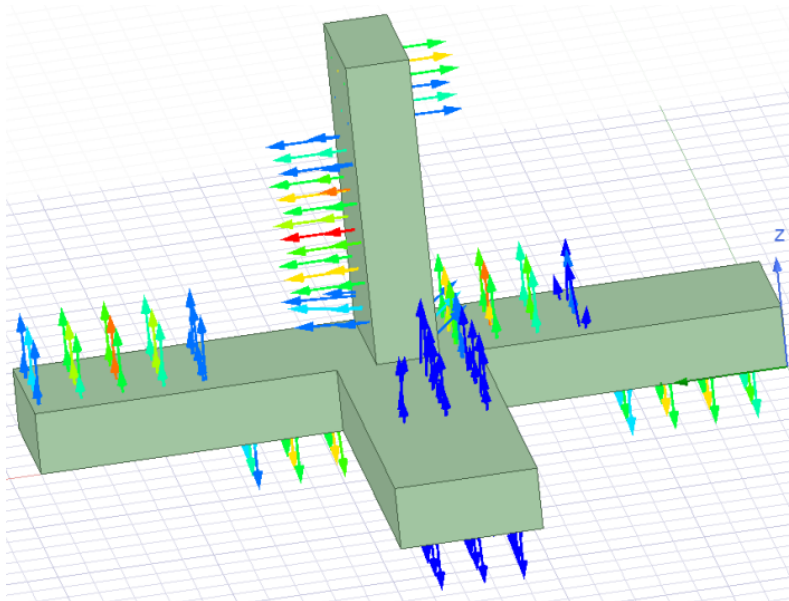
## Magic tee:



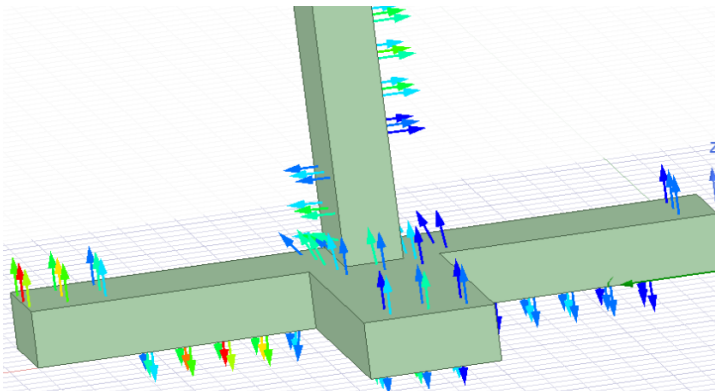
**Port 3 is excited:**



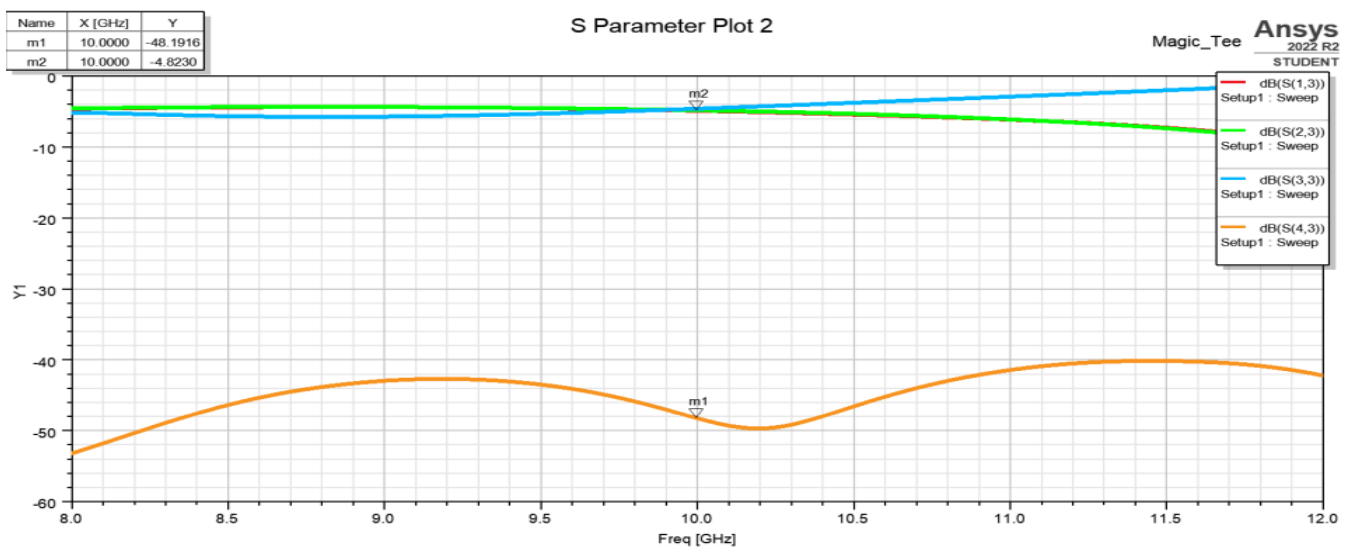
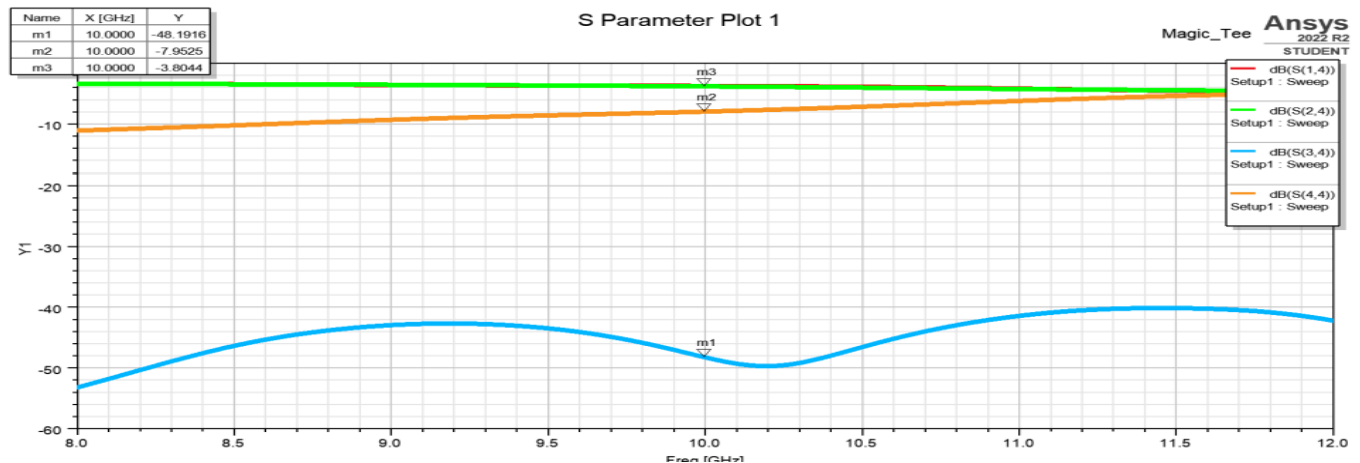
**Port 4 is excited:**



**Port 1 is excited:**







## Interference:

- When port 3 is excited, we can see that very little power goes into port 4 and it behaves like a H Plane Tee.
- When port 4 is excited, we can see that very little power goes into port 3 and it behaves like a E Plane Tee.
- When port 1 is excited, we see that most power goes into ports 3 and 4, and very little power goes into port 2



**Conclusion:** Signal propagation has been observed and analyzed in an E plane tee, H plane tee and a magic tee.