

QTT接收机技术预研



陈卯蒸

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宽带/超宽带馈源与极化器技术

- 7mm (30 – 50 GHz)
- 15cm (1 – 2 GHz)
- 30cm (0.6 – 4 GHz)
- Eleven Feed



7mm

- 馈源、90°移相器、OMT
- 技术难点不在电气设计，而是加工工艺
目前机加工精度±0.02mm，需要的加工精度为±0.01mm



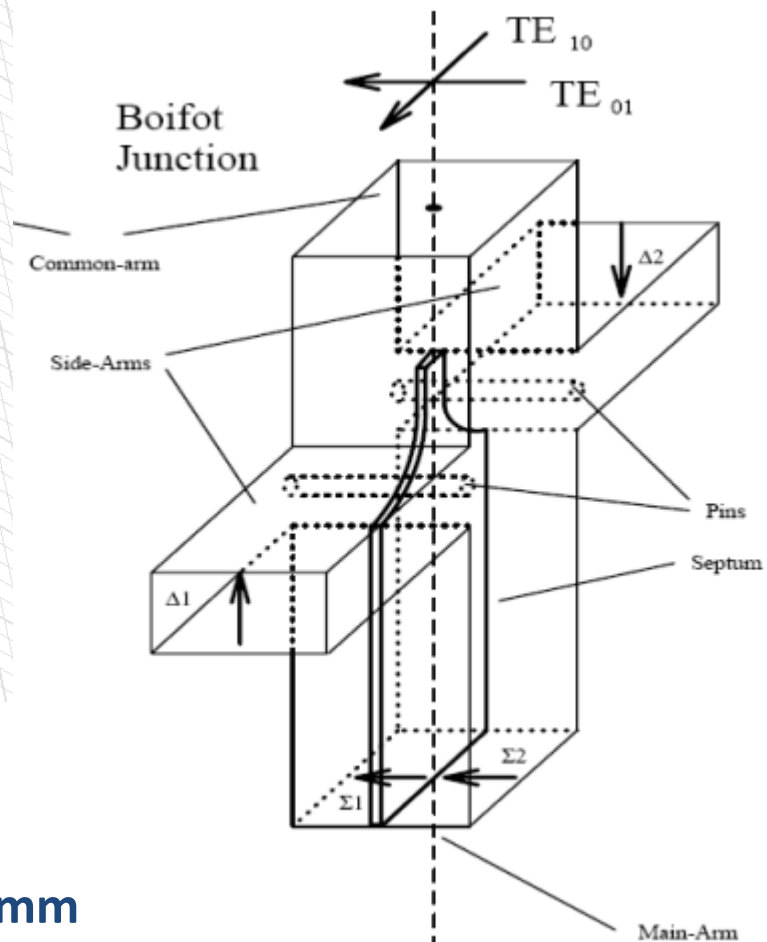
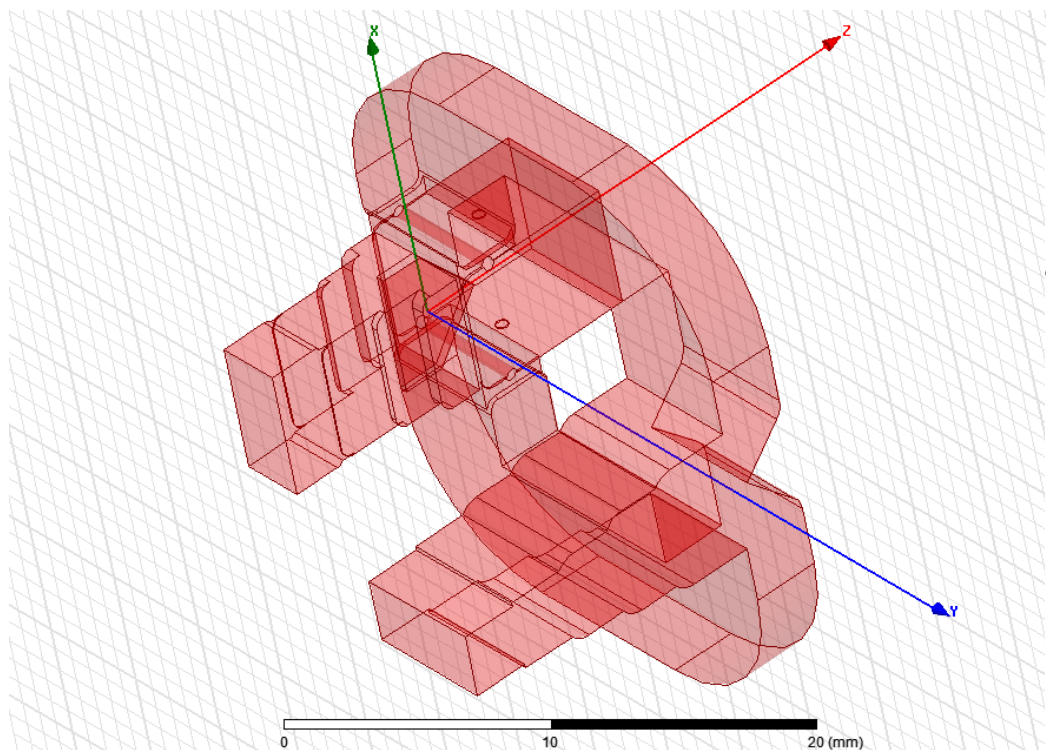
OMT

90度极化器

喇叭



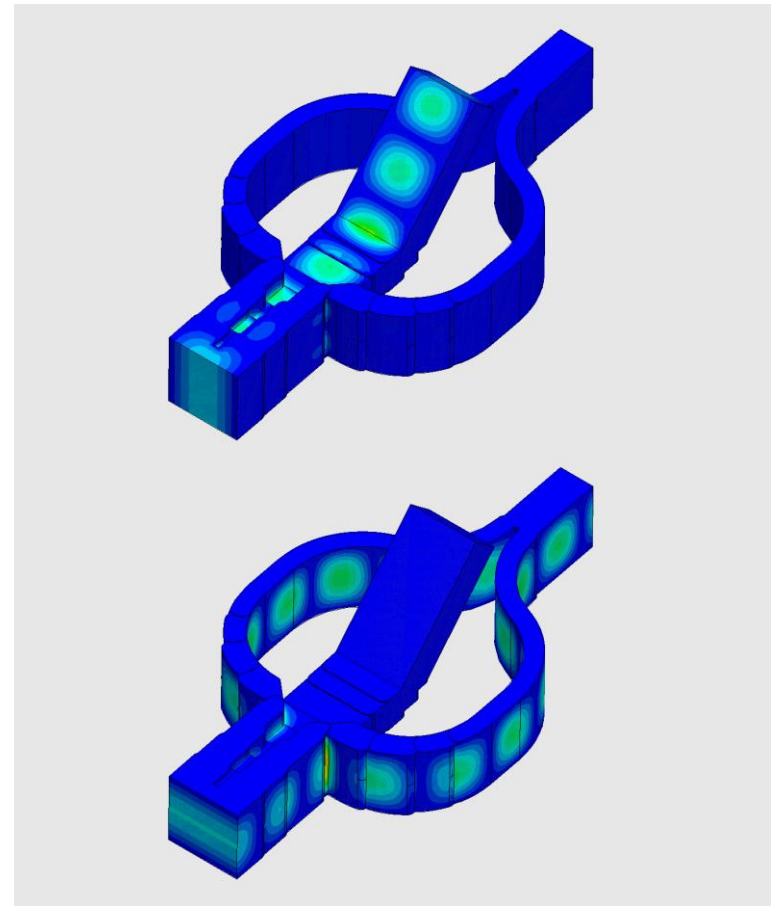
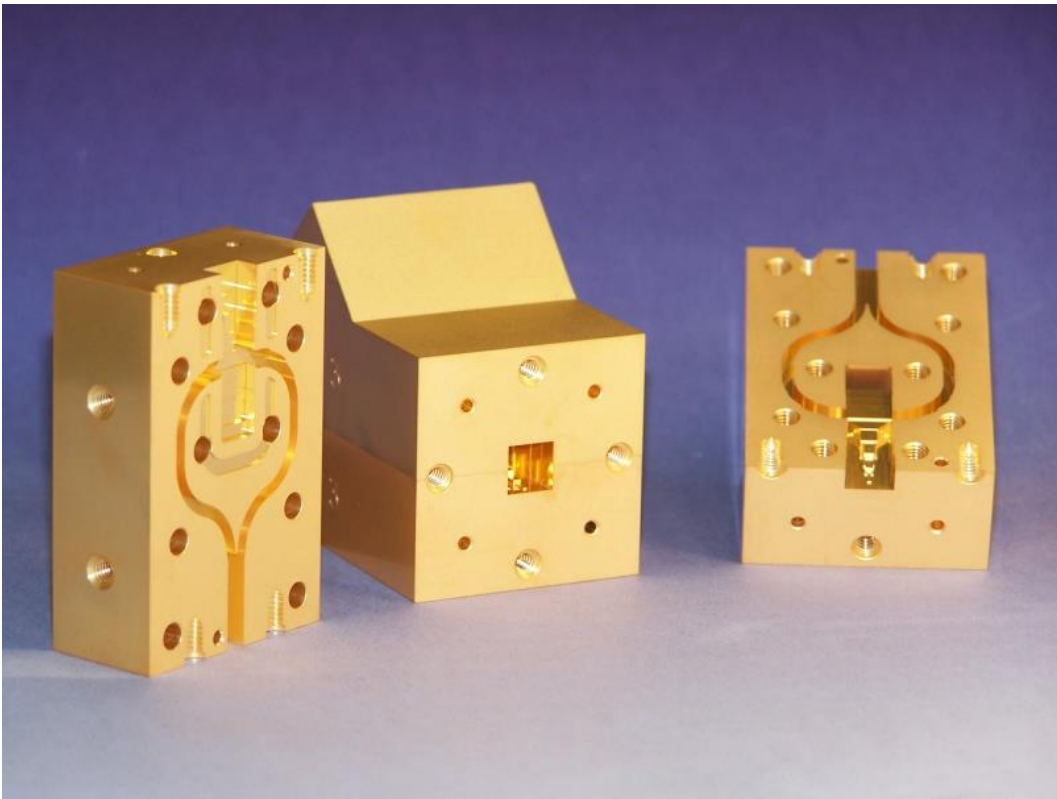
OMT (Bøifot Junction)



- 隔板：厚0.4mm；隔离销钉：直径0.51mm

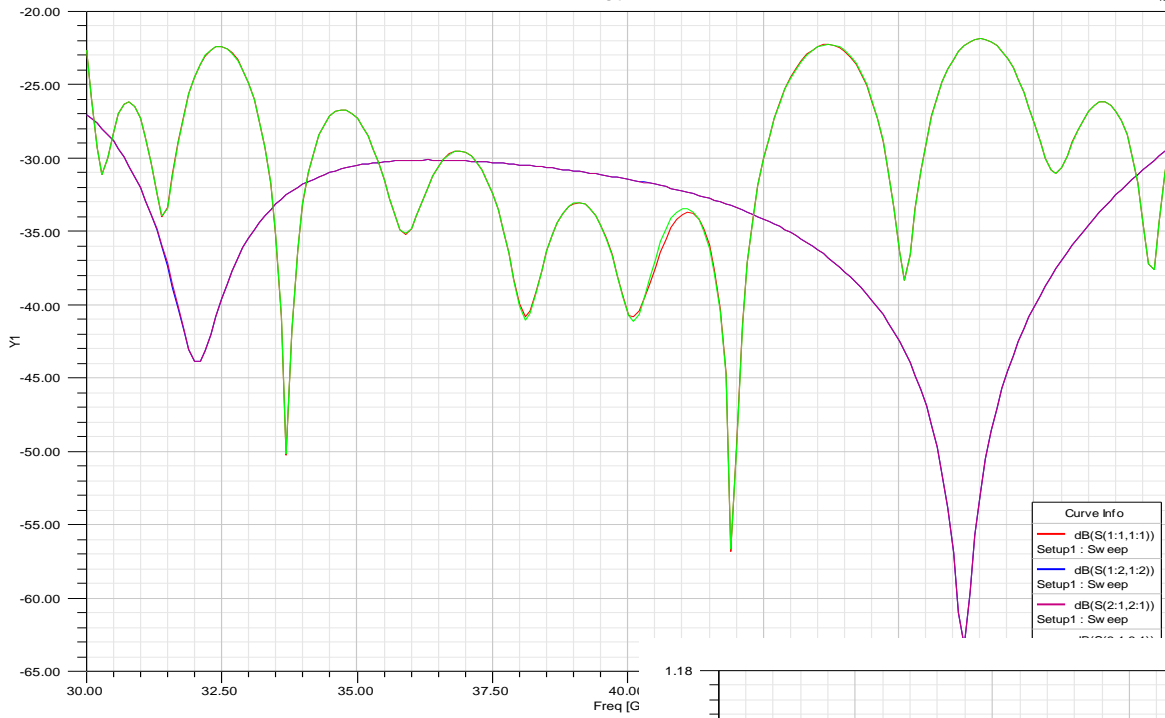
CASS

- Similar to Bøifot junction
- No pins, no septum



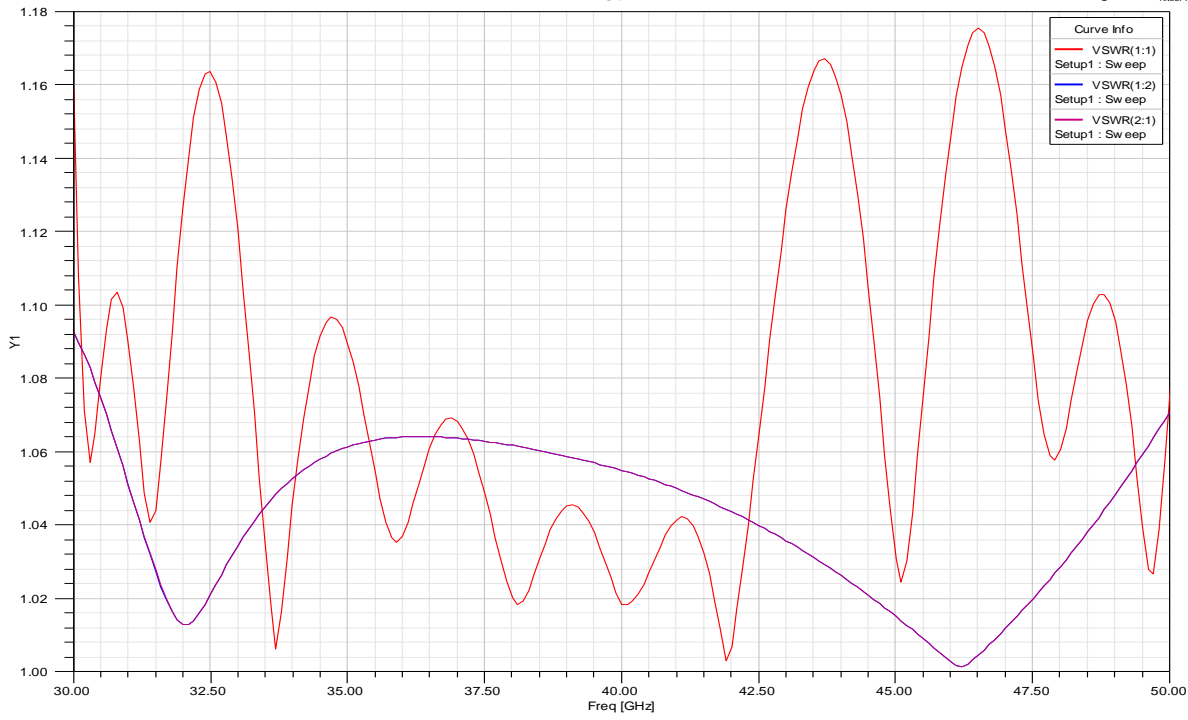
XY Plot 1

ZG4-good1 ANSOFT

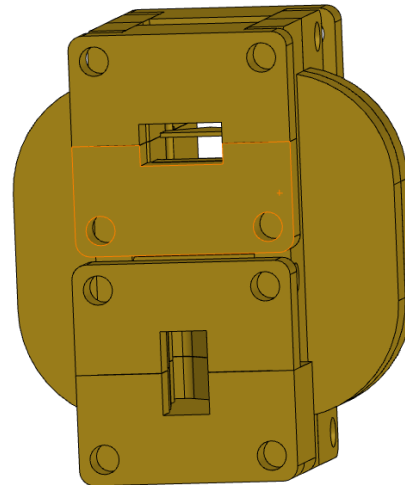
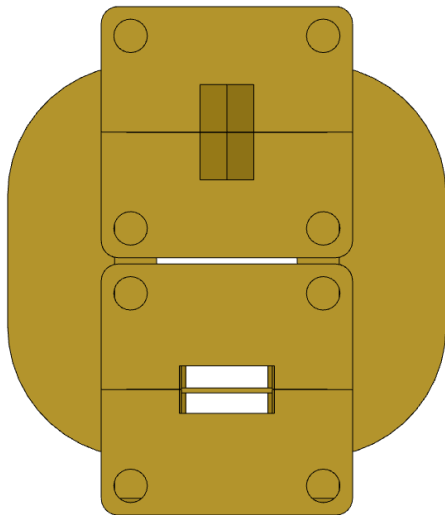
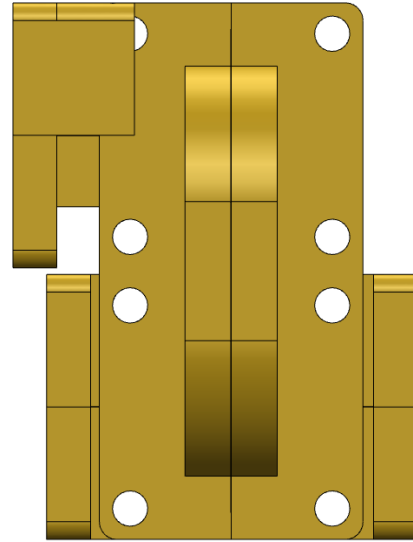
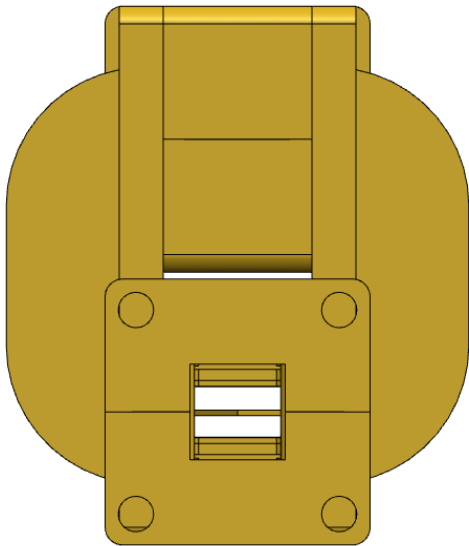


XY Plot 4

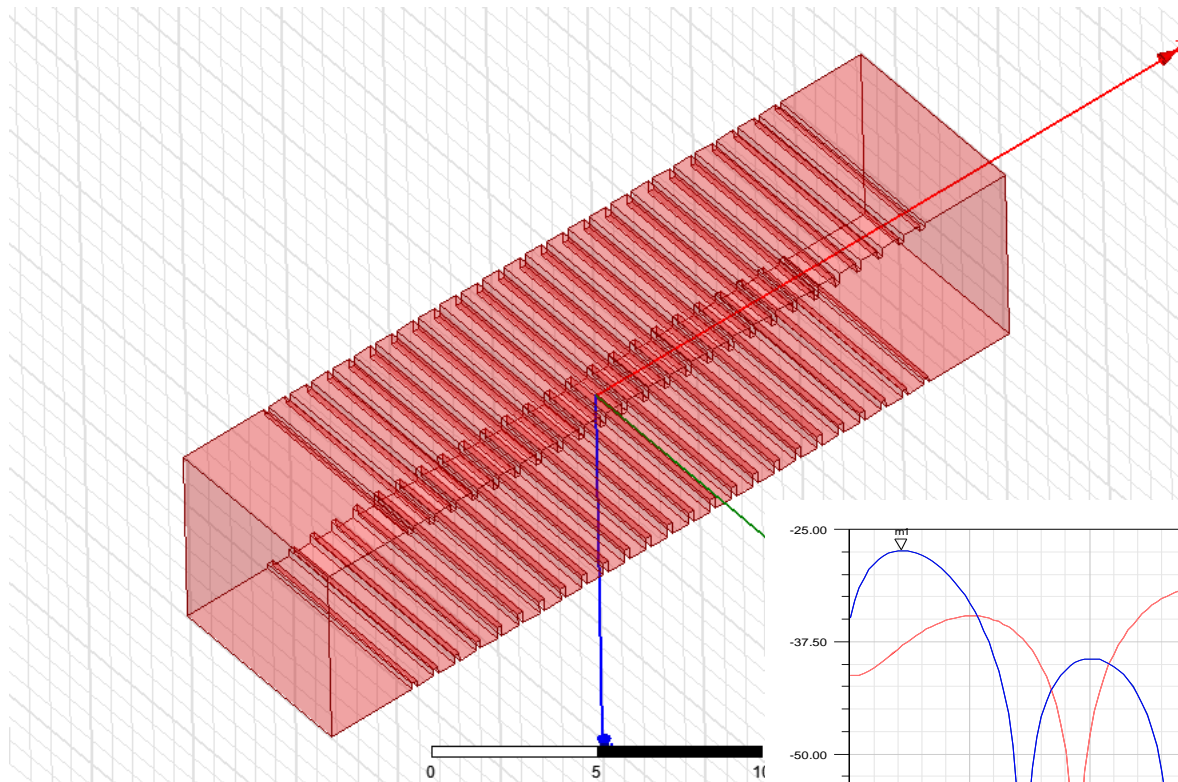
ZG4-good1 ANSOFT



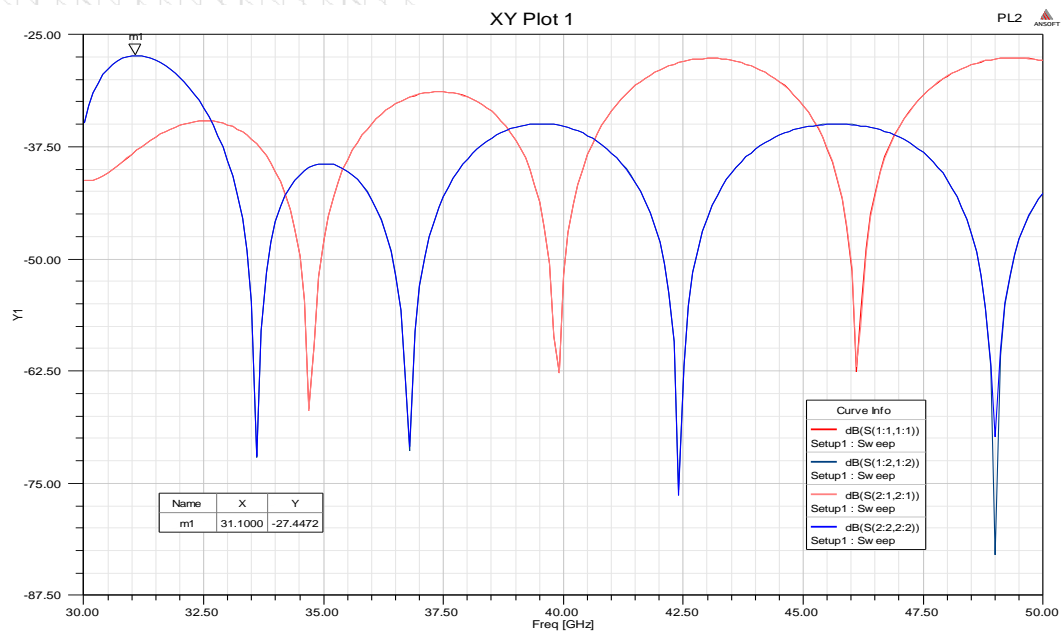
装配图



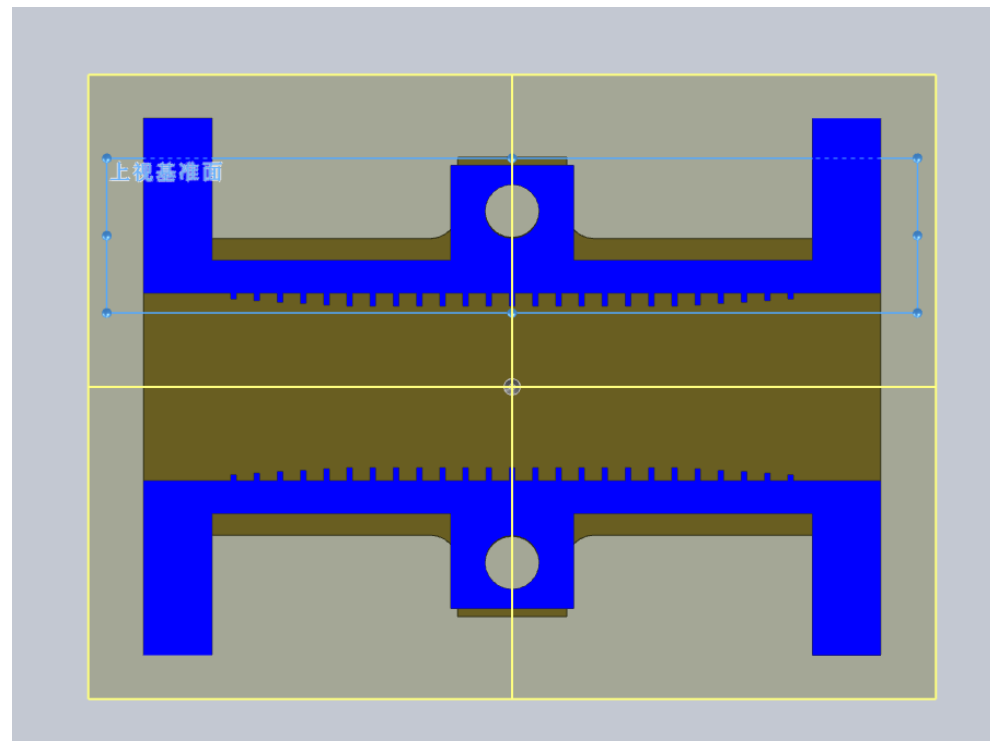
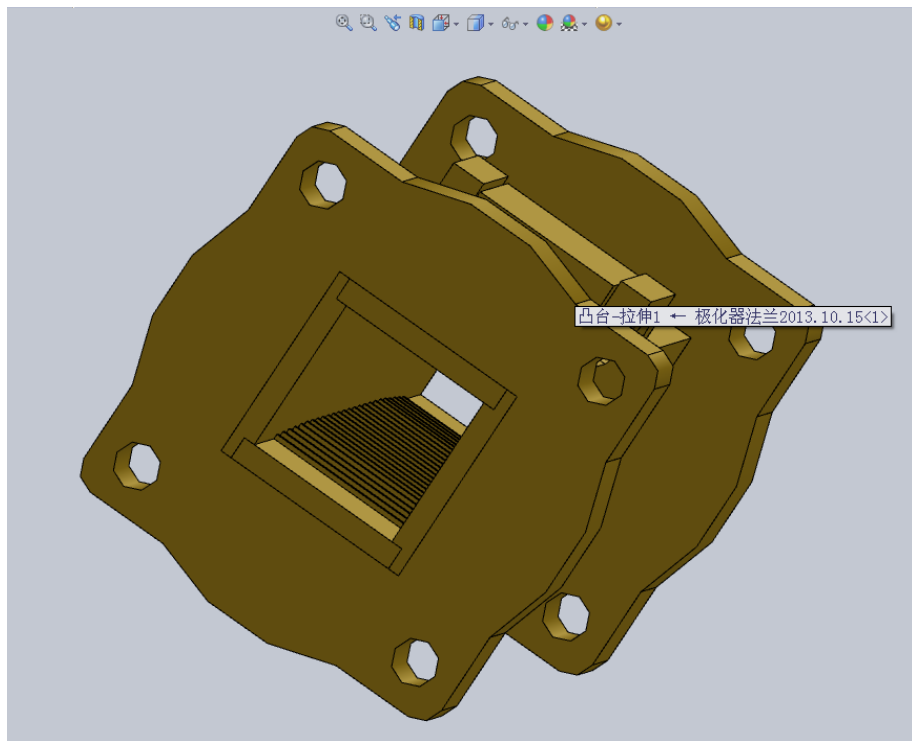
90°移相器



- 相位特性: $90^\circ \pm 6.5^\circ$

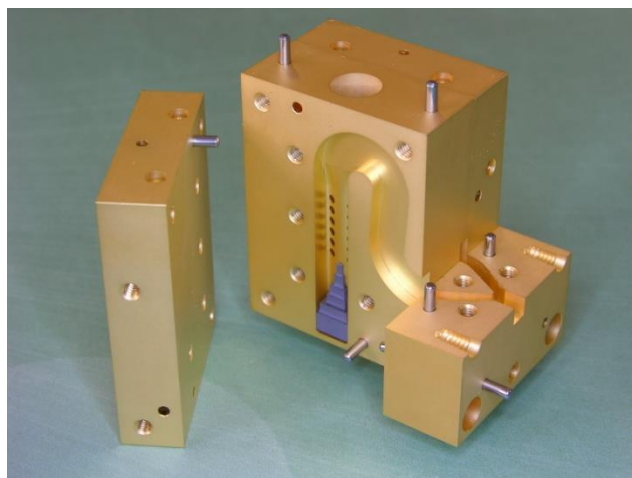


装配图



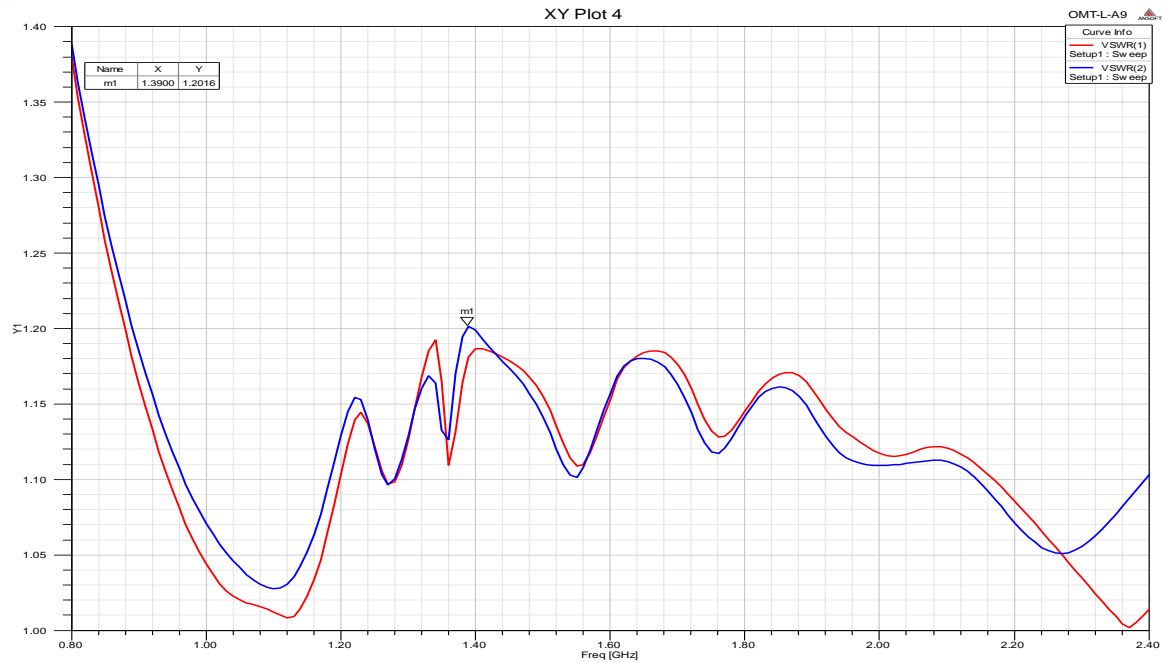
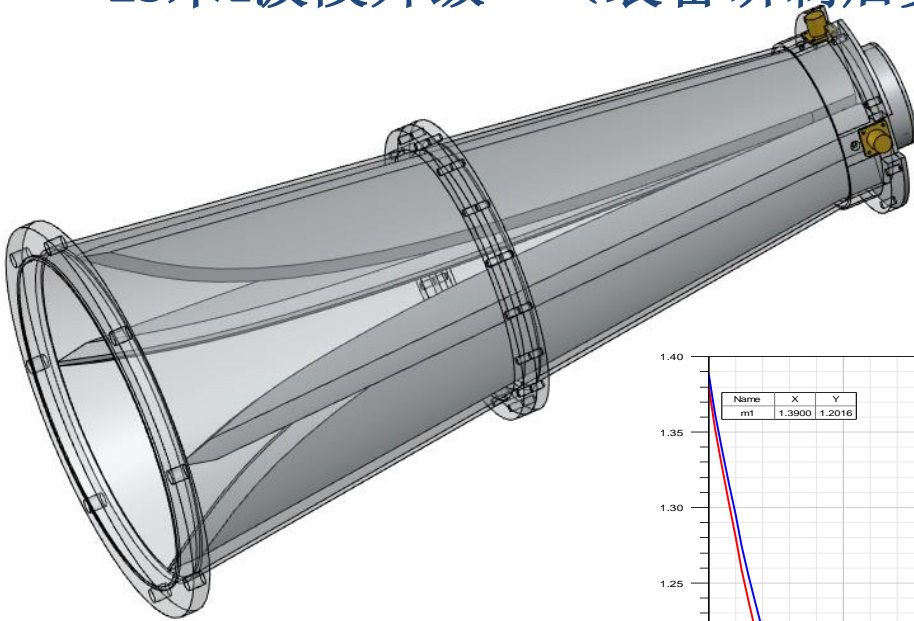
7mm接收机

- 关键器件：
 - 低温LNA（微电子所）
 - 馈源、OMT（39所）
 - LO、混频器（SSM?）……
- 25米双波束（试制，多波束经验）

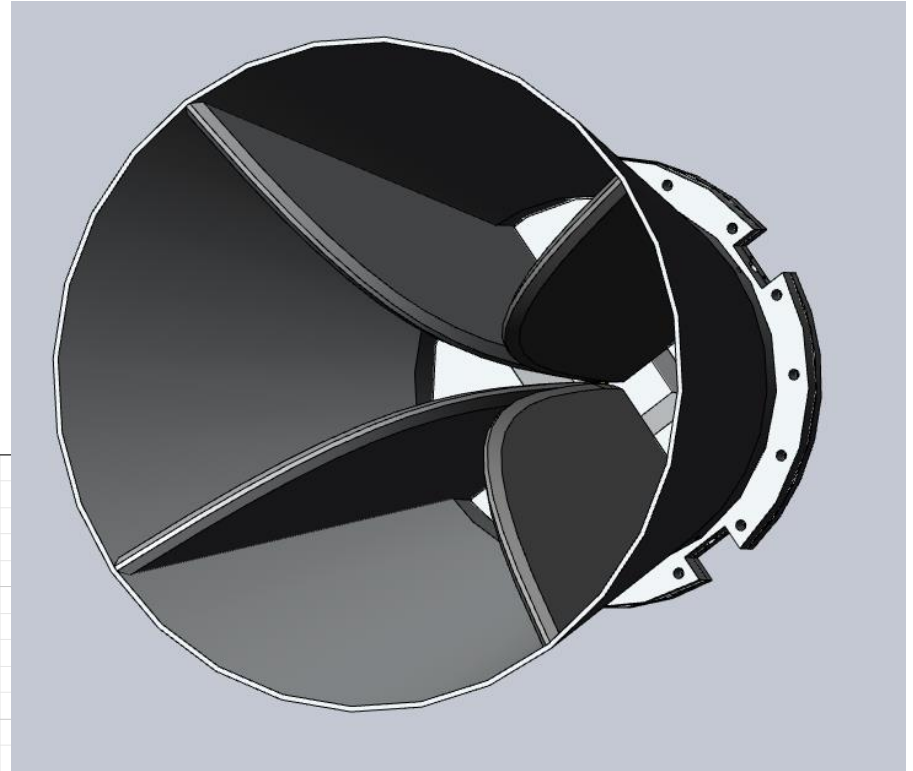


15cm

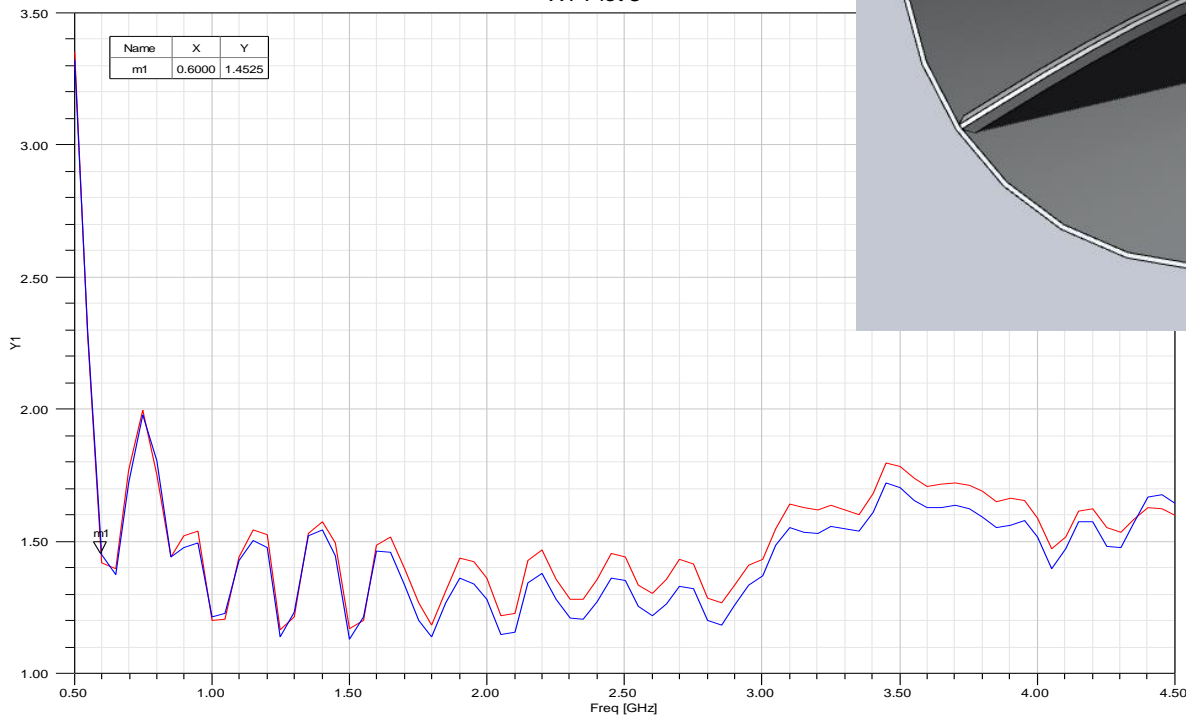
- DW40项目：0.85 – 2.25 GHz
- 25米L波段升级？（装备研制后支持）



30cm (0.6 – 4 GHz)

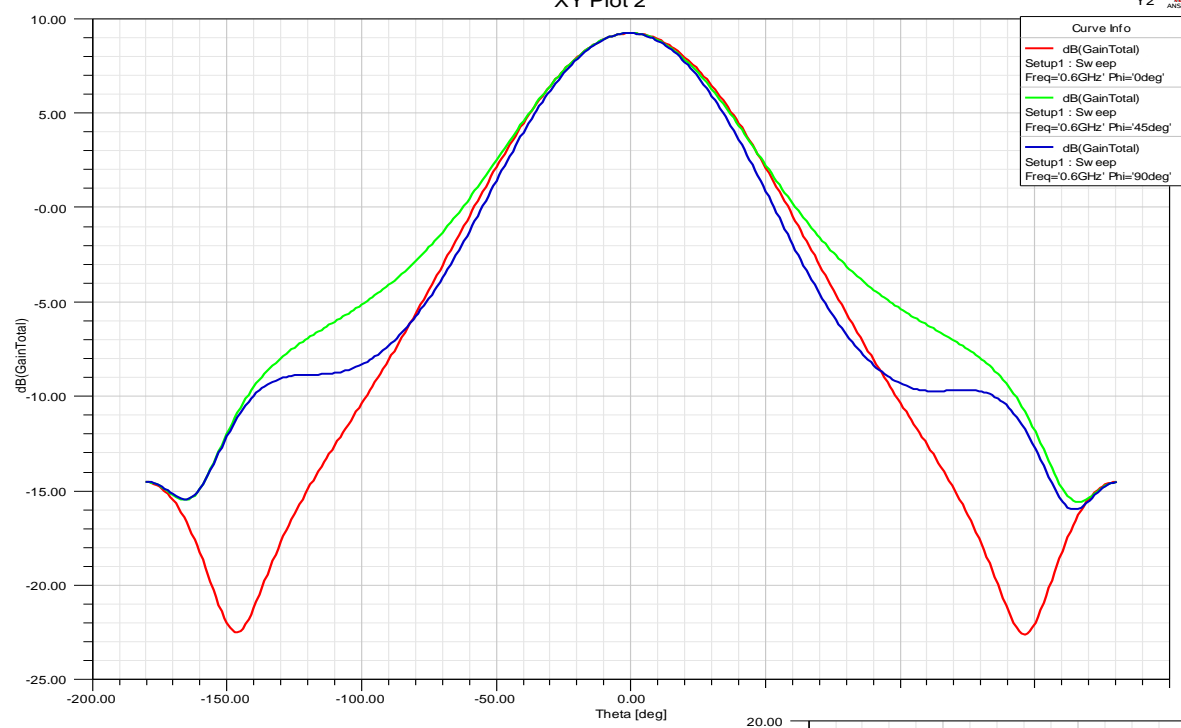


XY Plot 3



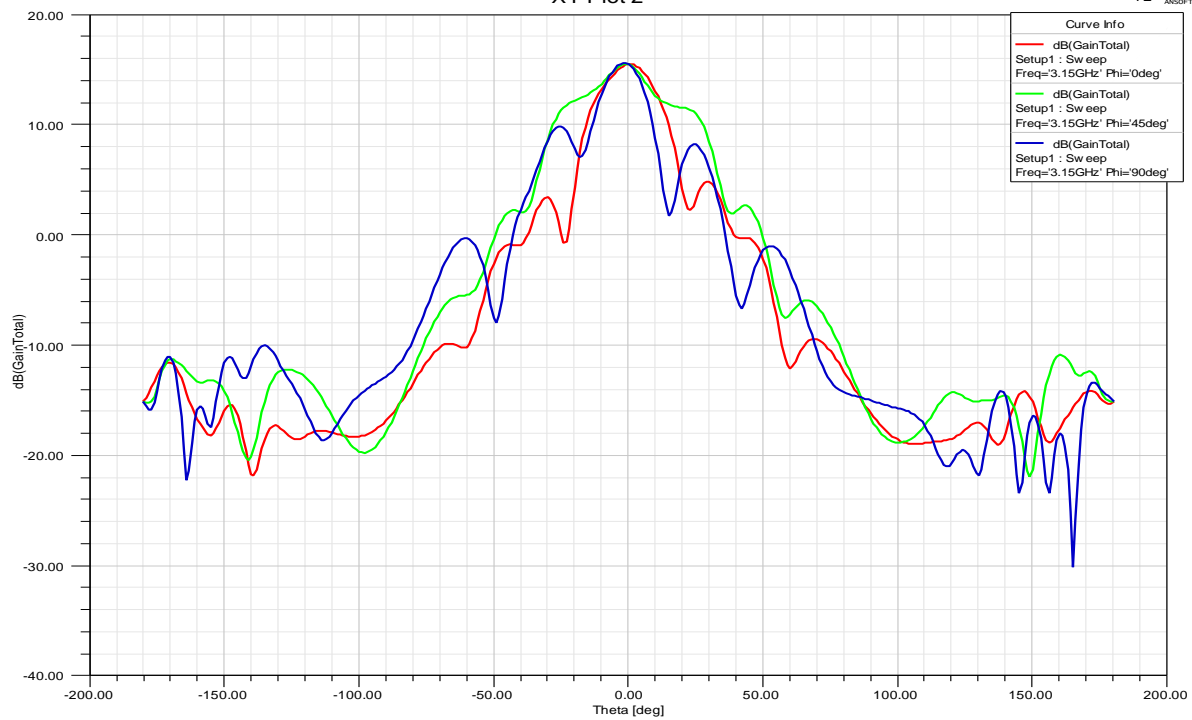
XY Plot 2

Y2 ANSOFT

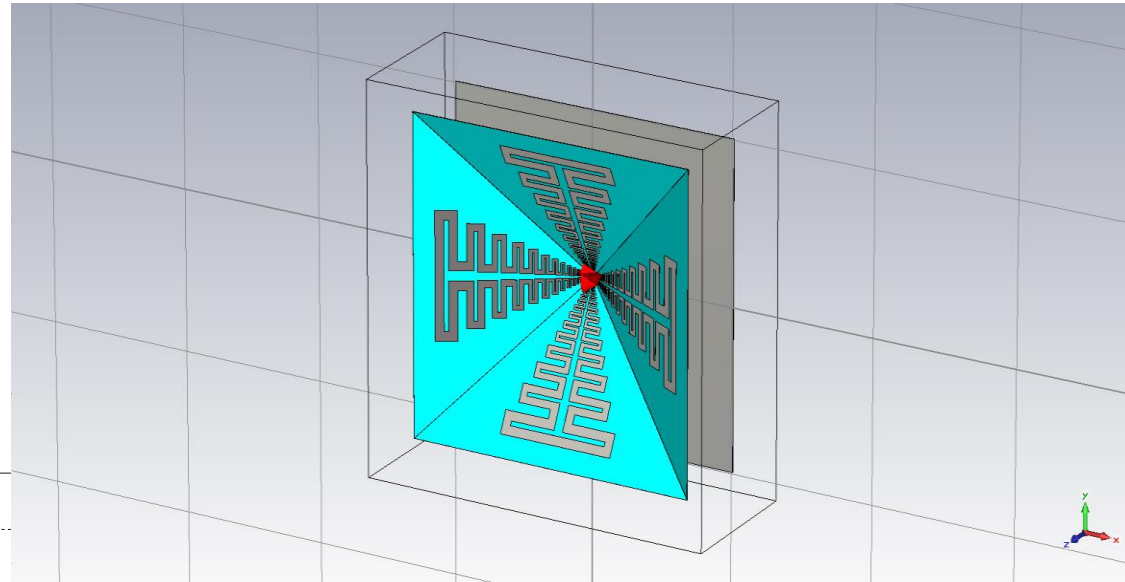


XY Plot 2

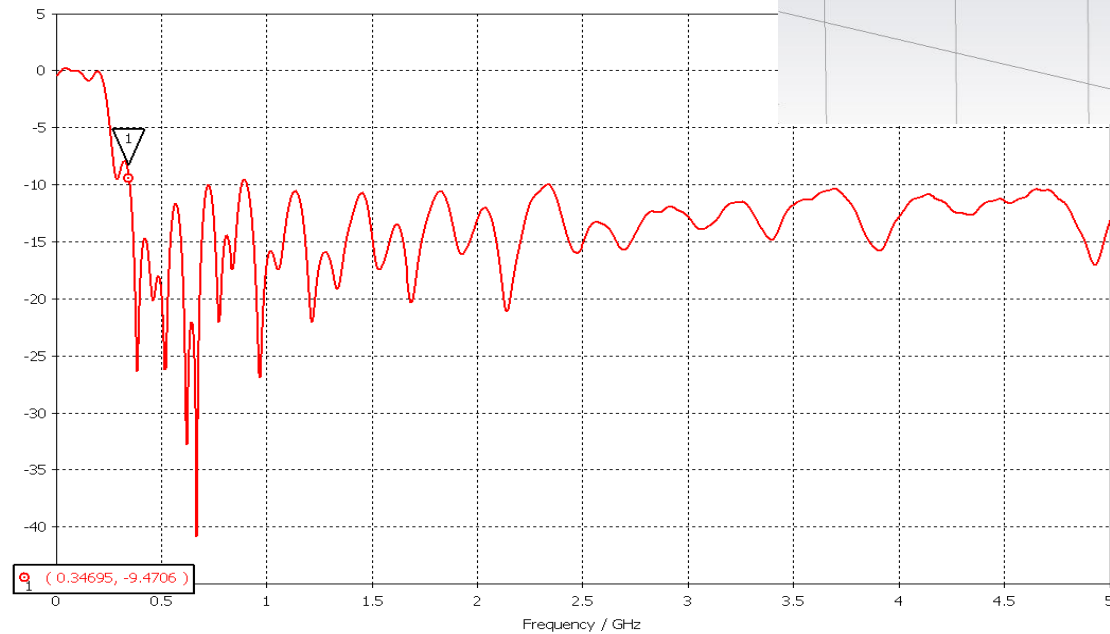
Y2 ANSOFT

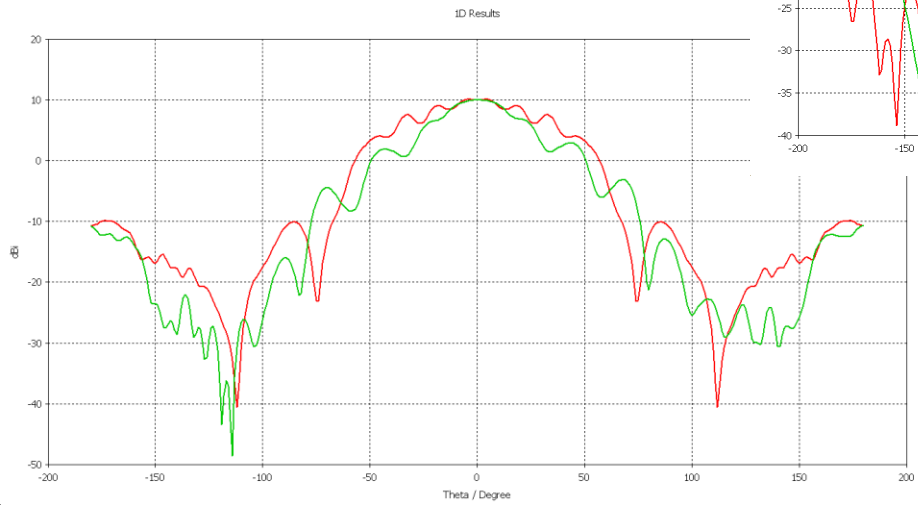
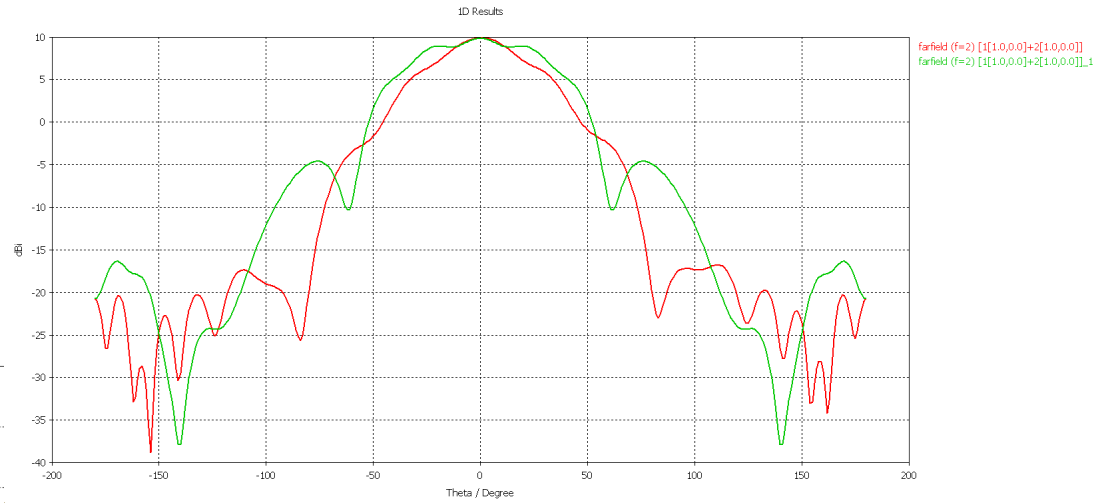
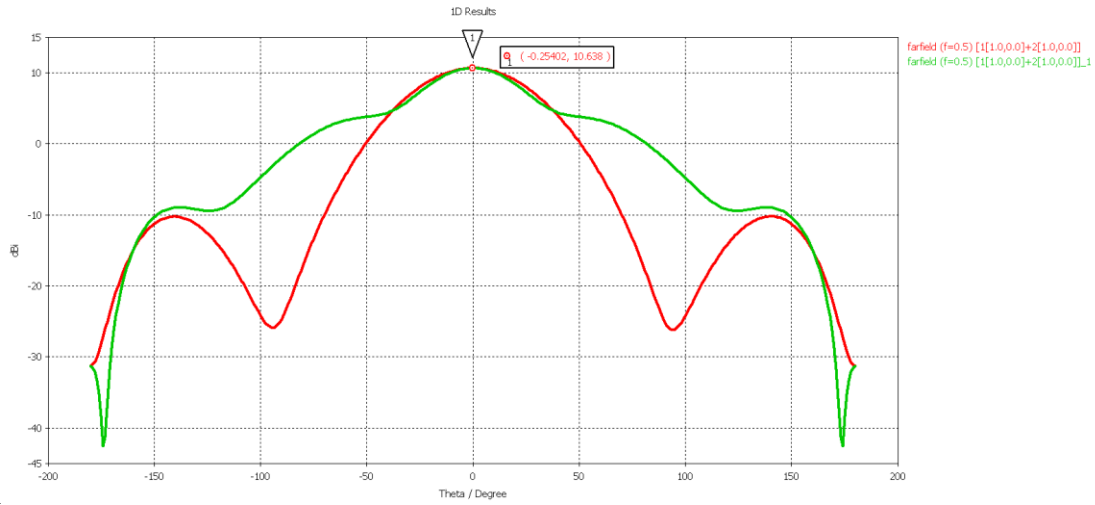


Eleven Feed (0.5 – 5 GHz)

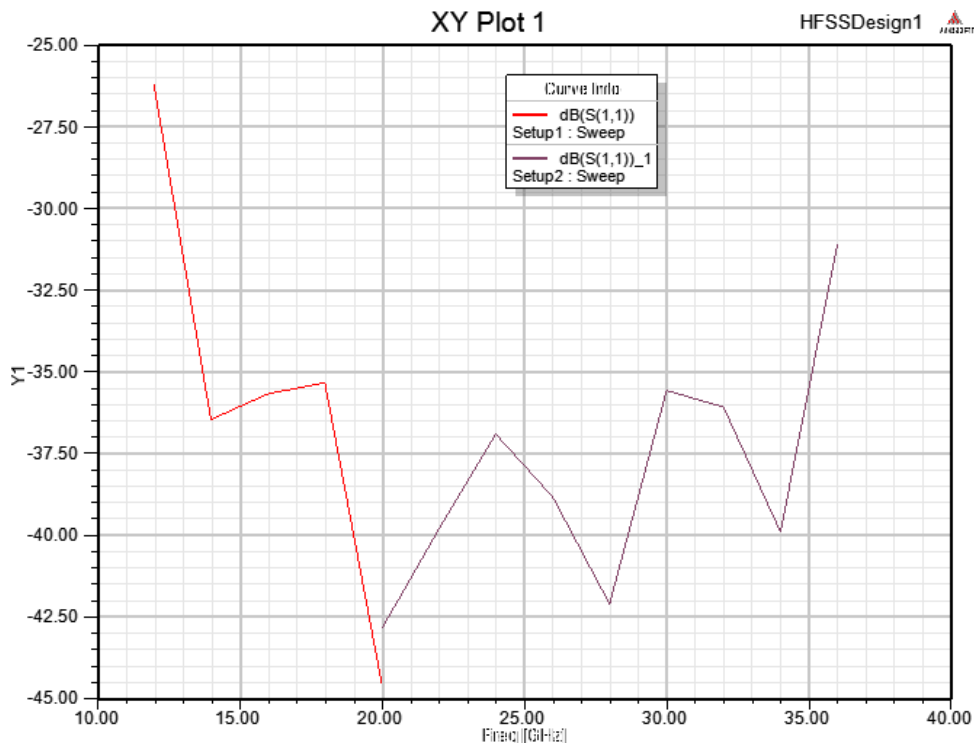
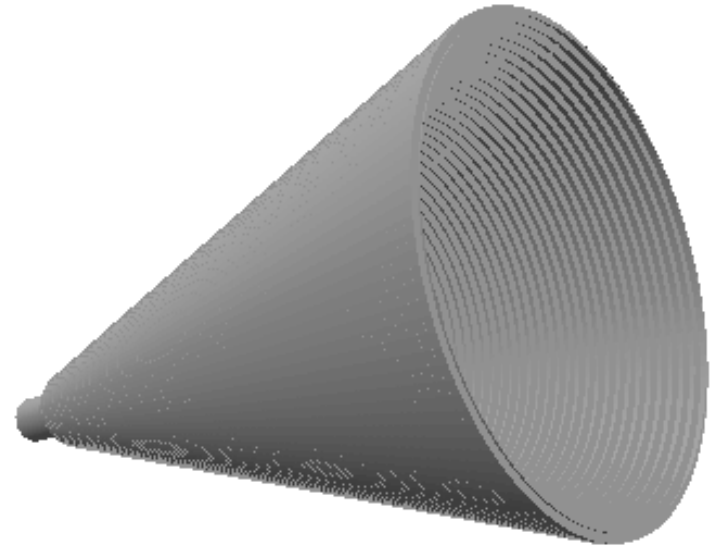


S-Parameter Magnitude in dB

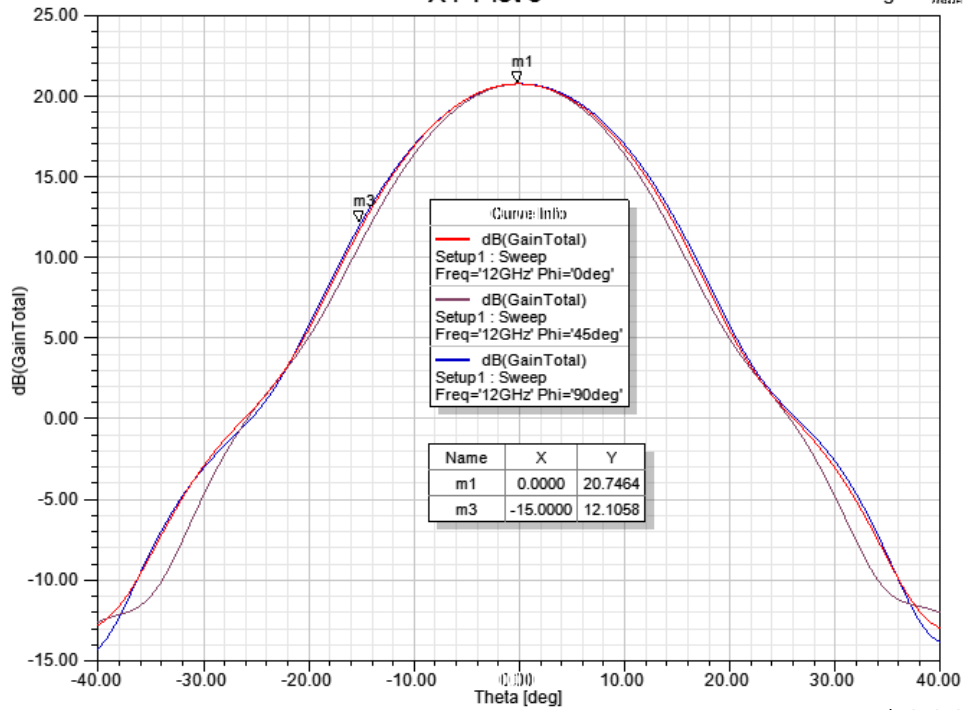




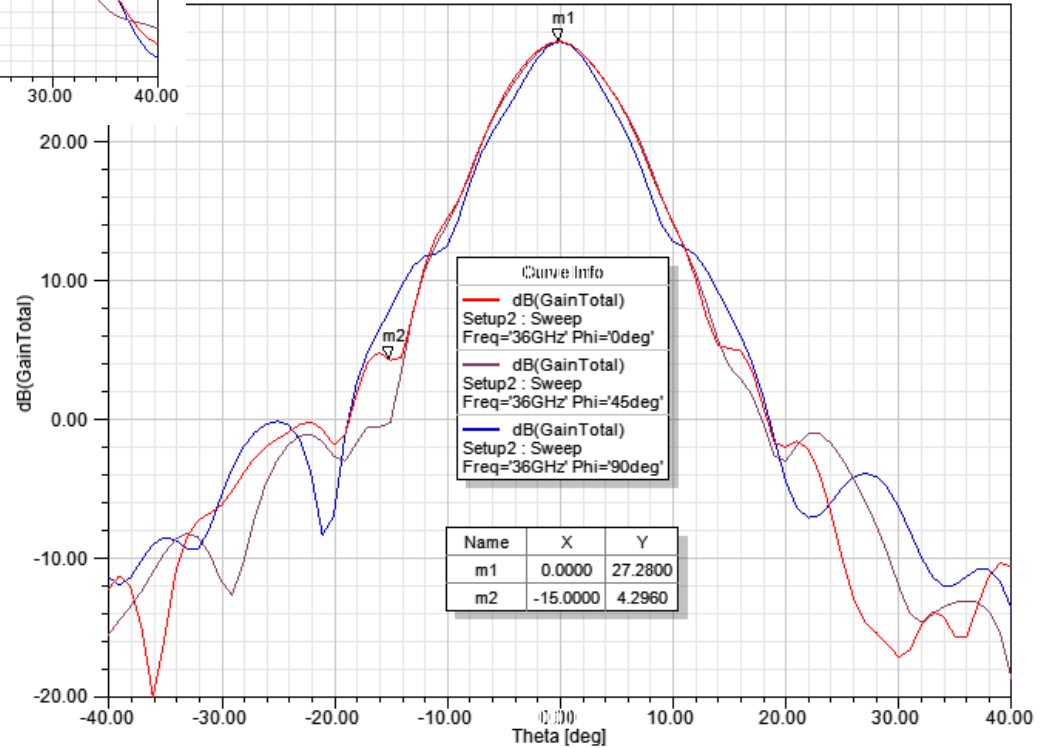
12 – 36 GHz



XY Plot 3



XY Plot 7



- 大部分还处于建模仿真阶段
- 重点选择
 - 科学目标 (UBB 0.6 - 4GHz)
- **K波段?**
 - ATCA: 16 - 26 GHz

