

2013 Broadcasters

Clinic

Filters

The building block of combiners

Bob Surette

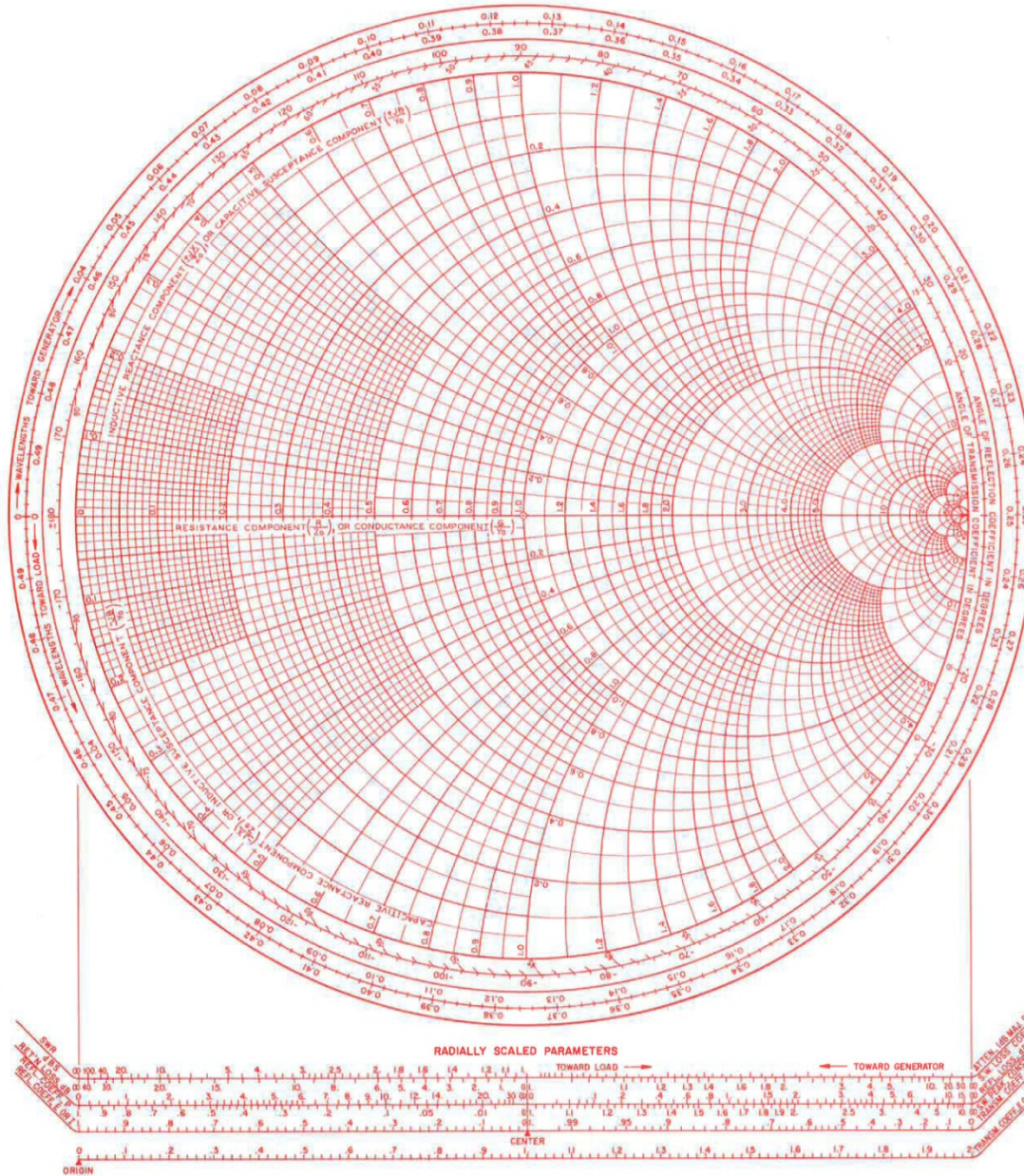
Director of Sales Engineering

Tuesday October 8, 2013

Developed in 1939 by Phillip H. Smith

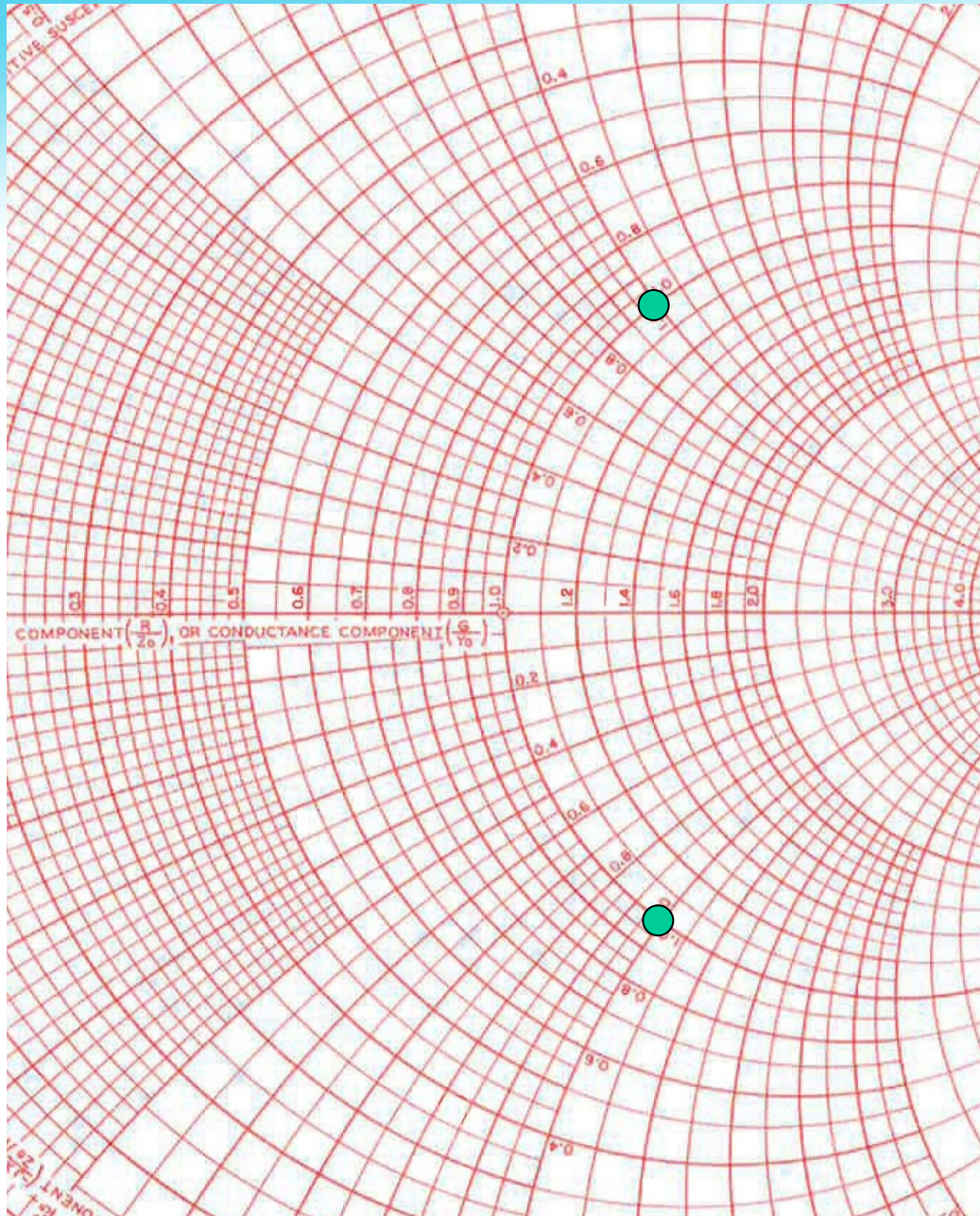
NAME	TITLE	DWG. NO.
SMITH® CHART FORM 82-BSPR (9-66)	ANALOG INSTRUMENTS COMPANY, NEW PROVIDENCE, N.J. 07974	DATE

IMPEDANCE OR ADMITTANCE COORDINATES



Reference 0°

$\lambda/4 = 90^\circ$



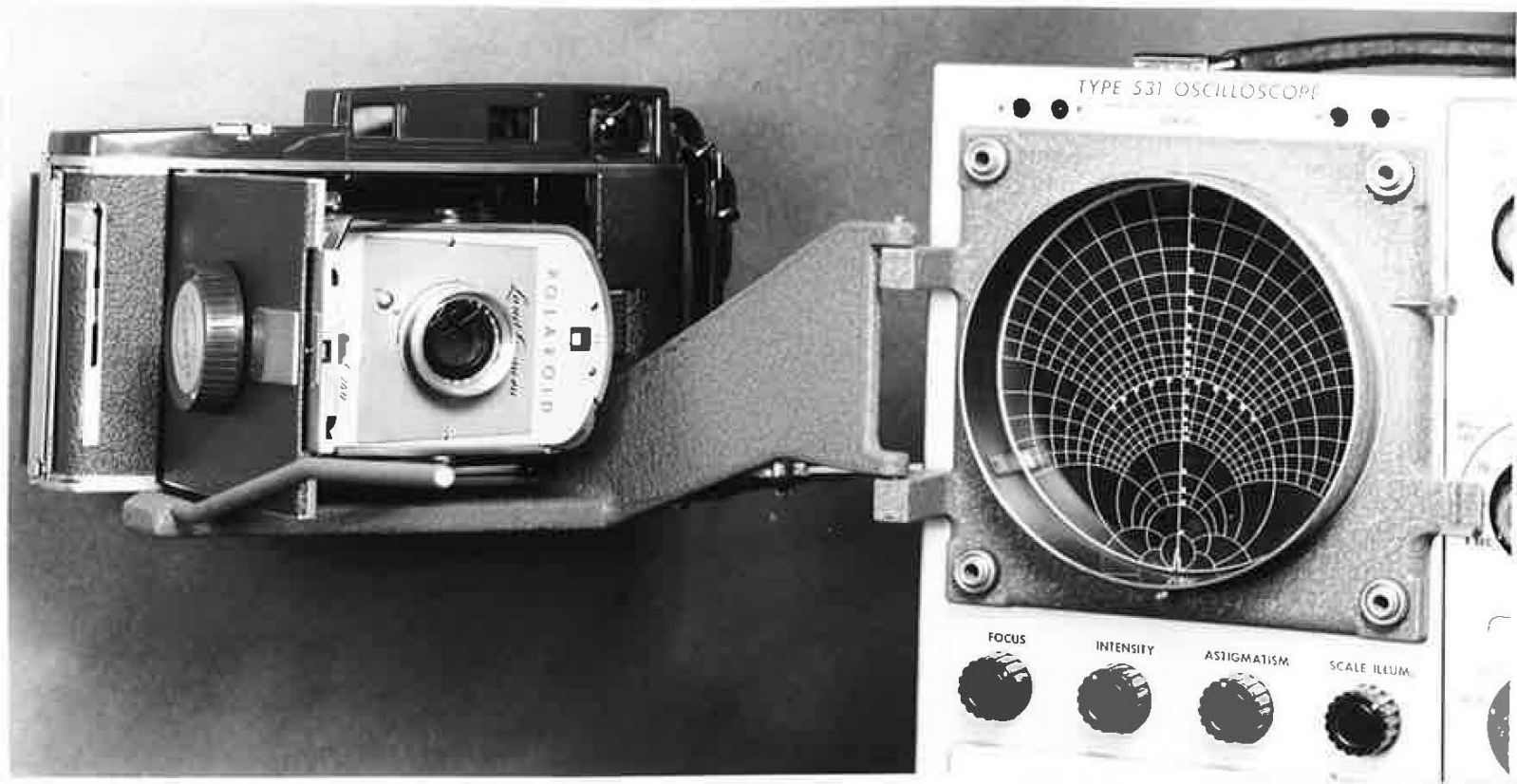
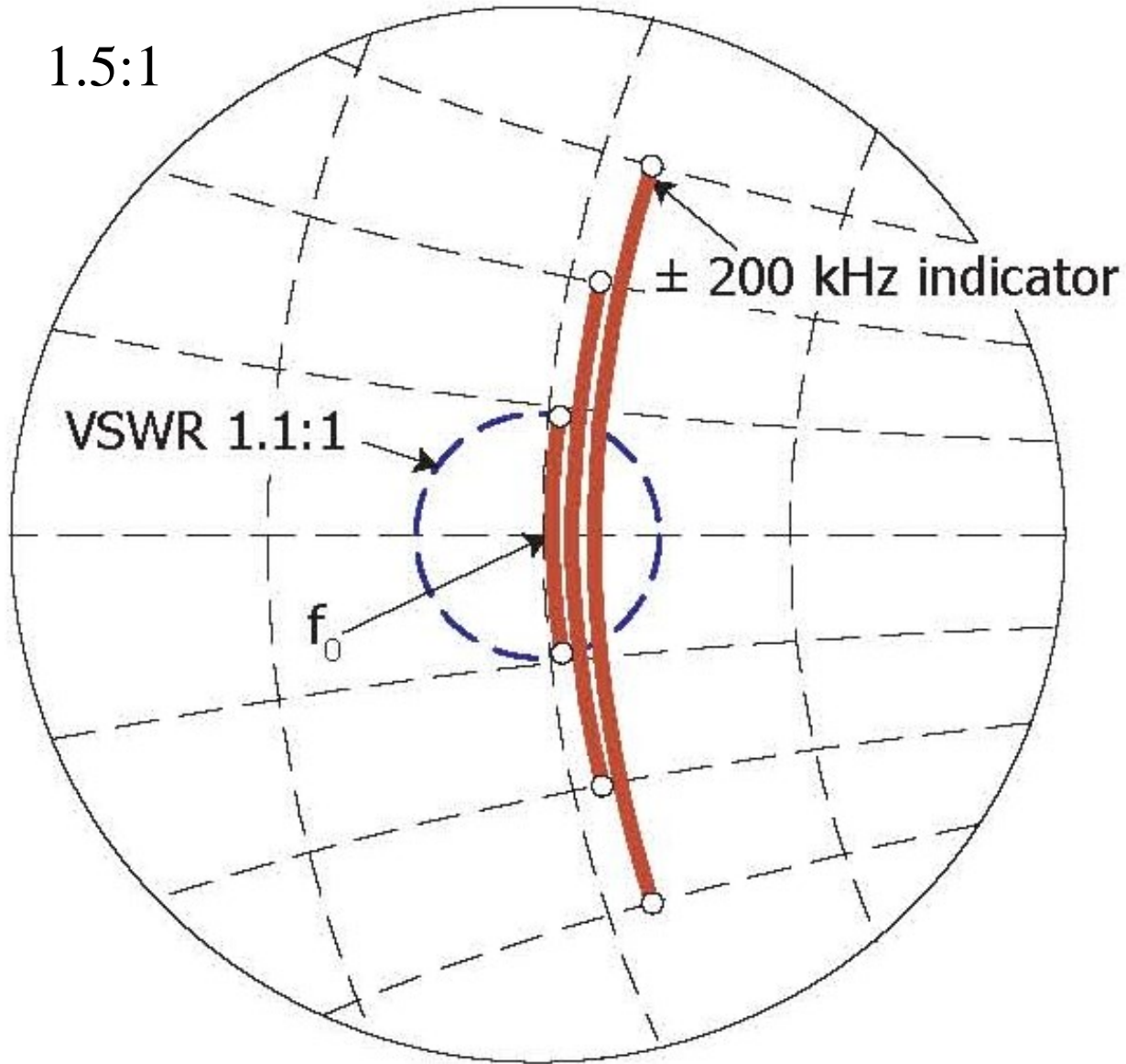
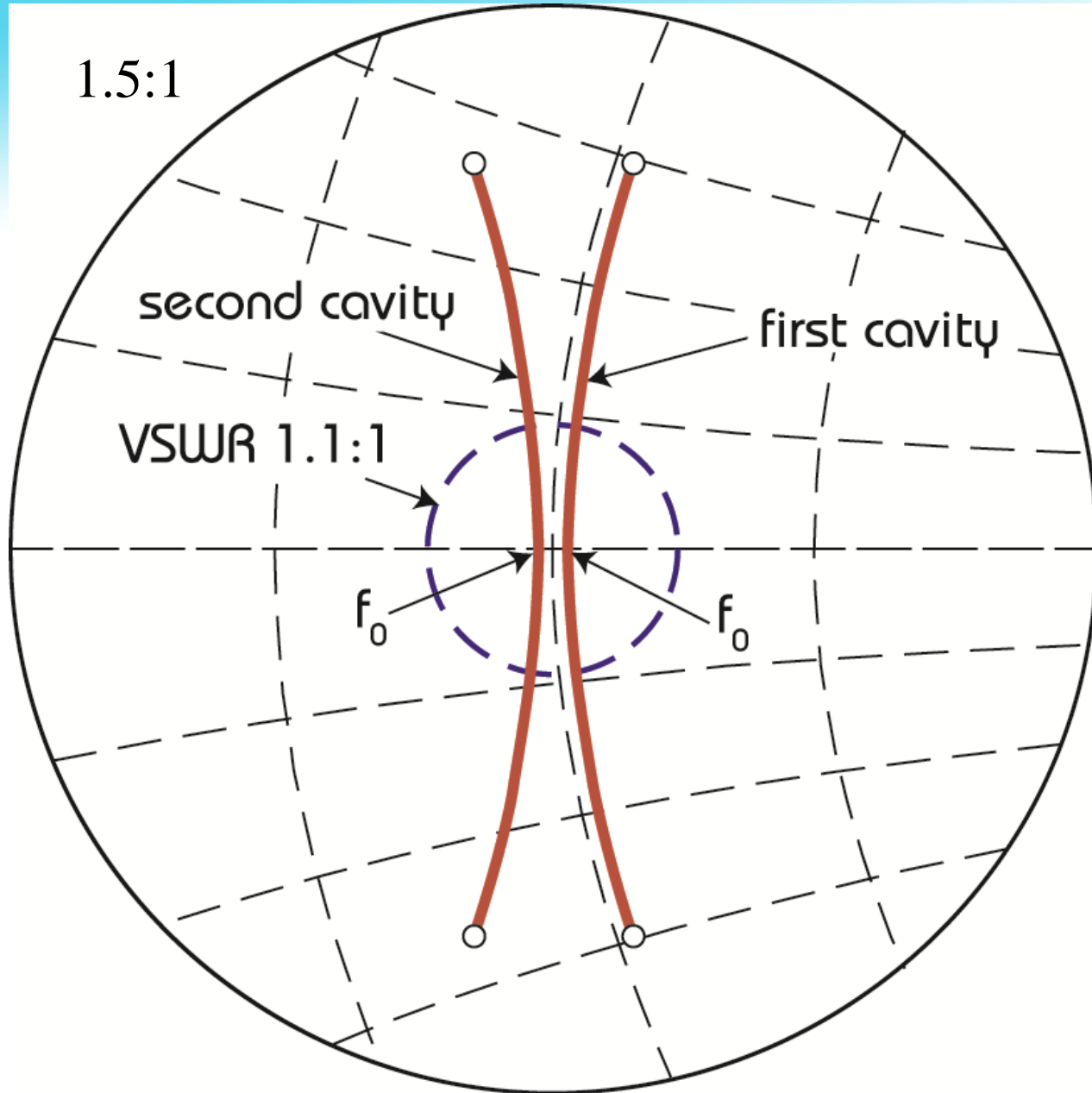


Figure 3-7. Camera Mount Installed On Bezel Assembly Pins.

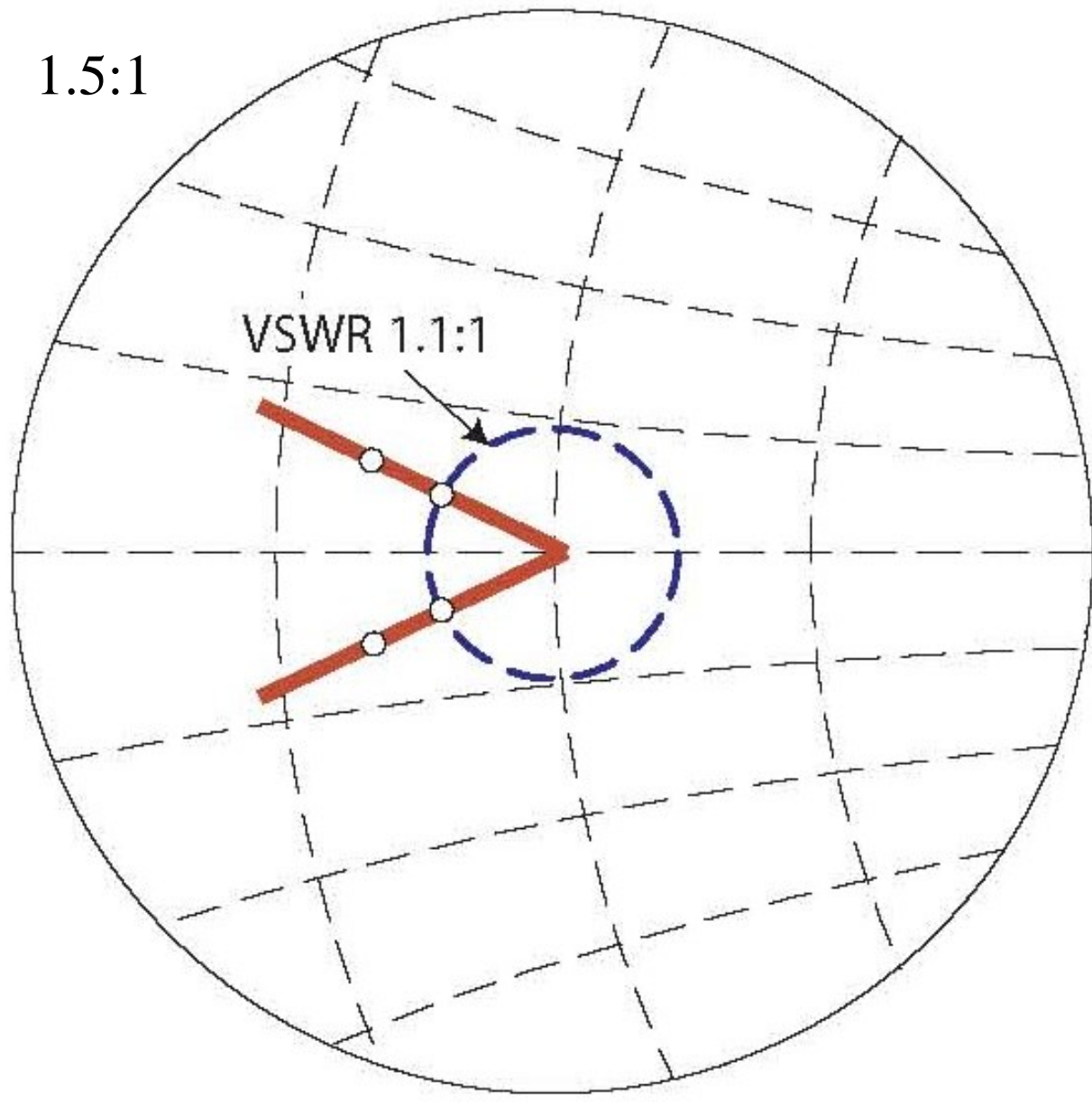
1.5:1



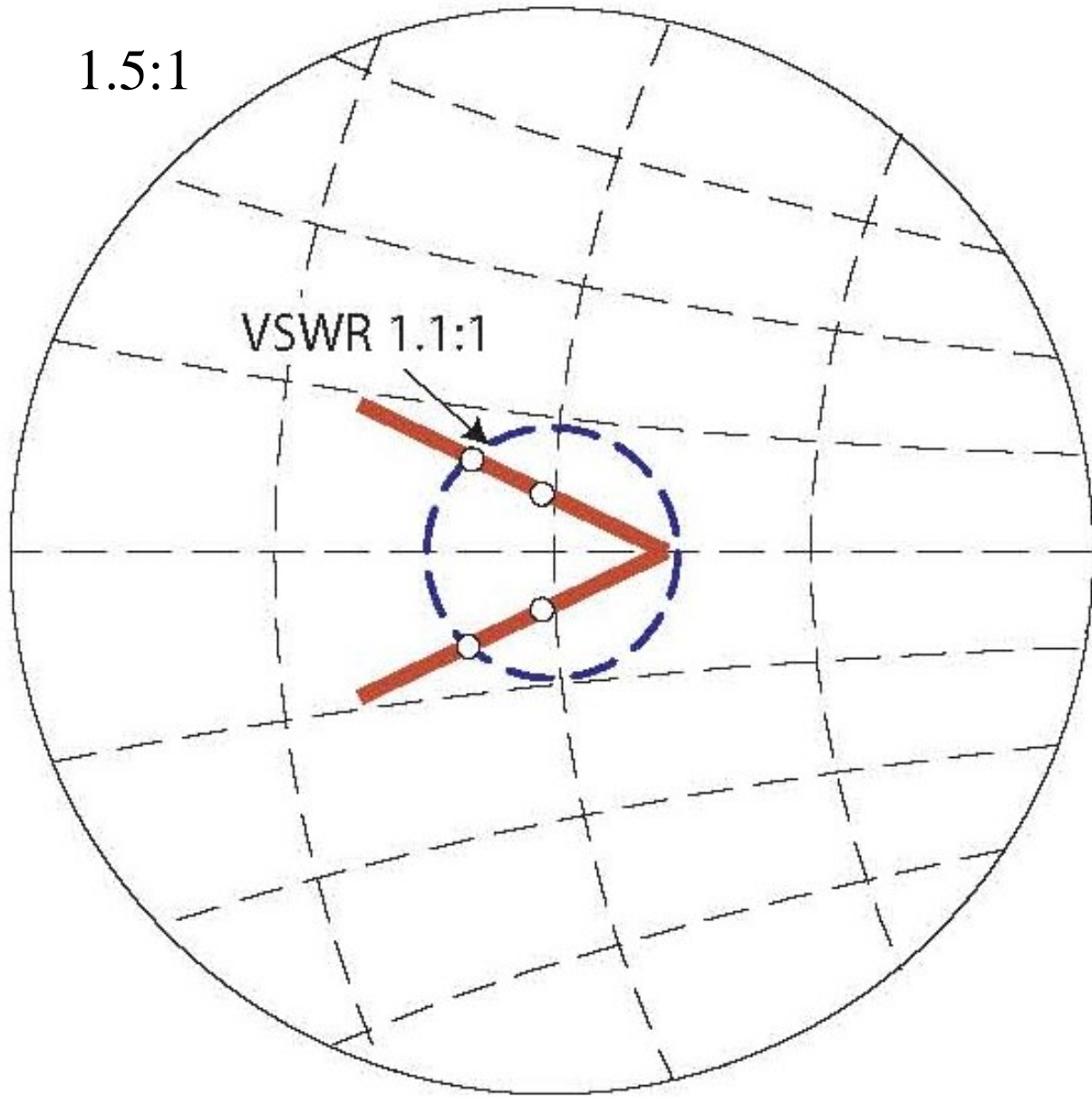
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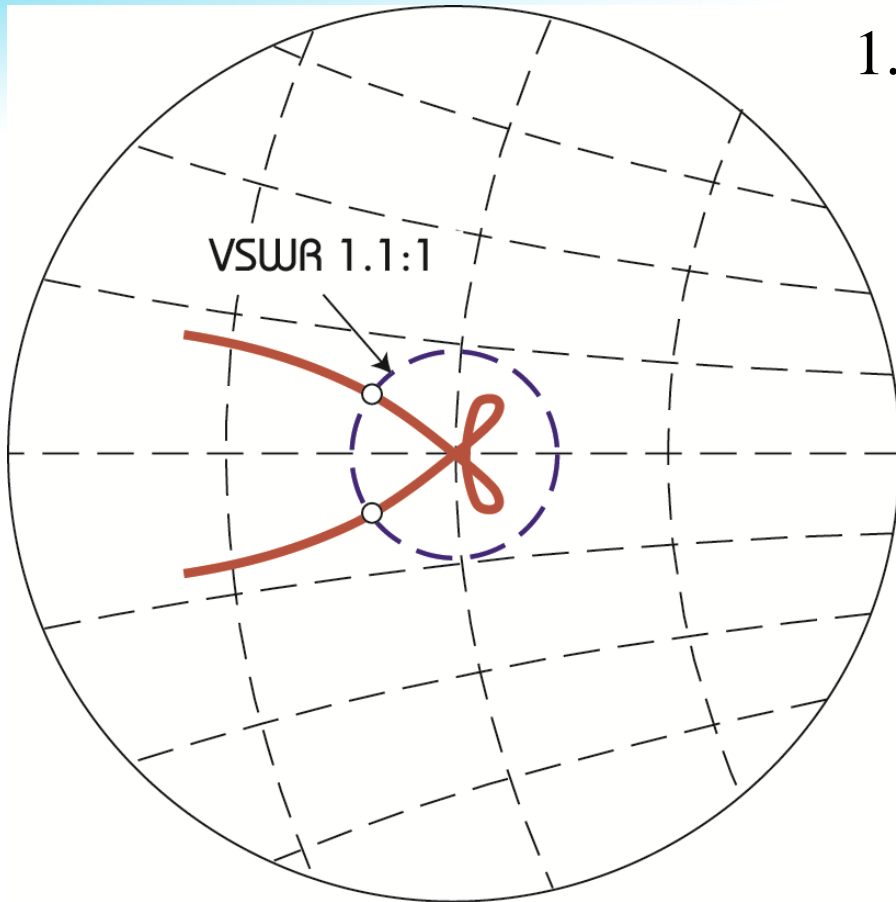
1.5:1



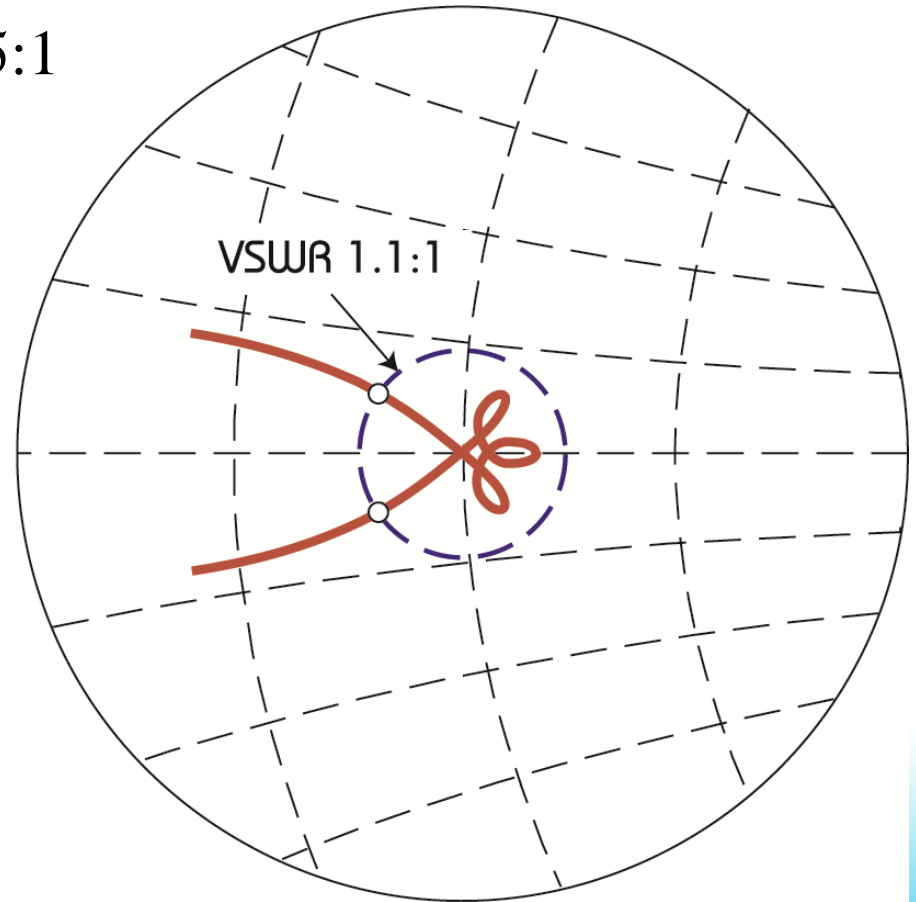
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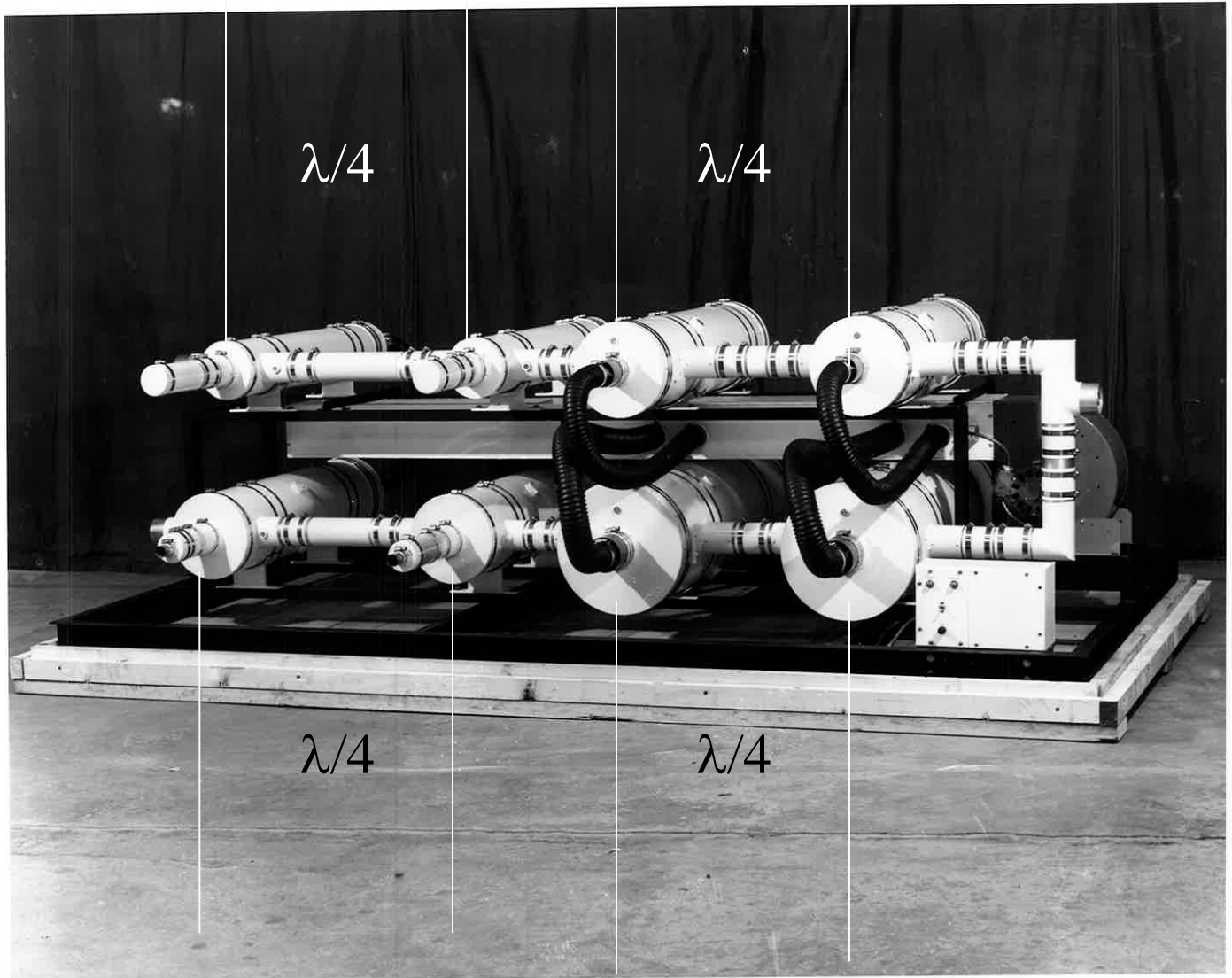
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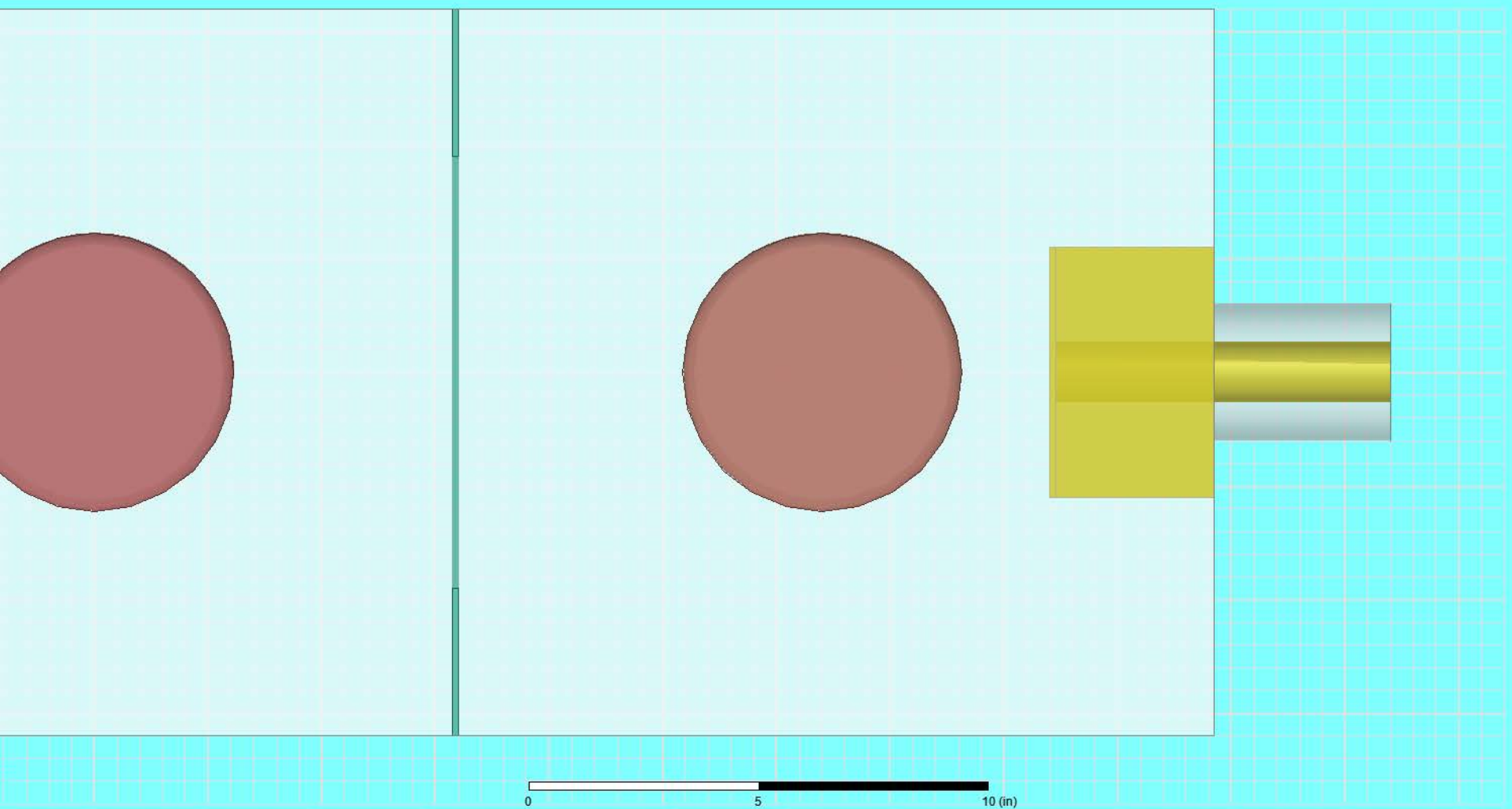
3 Cavity Filter

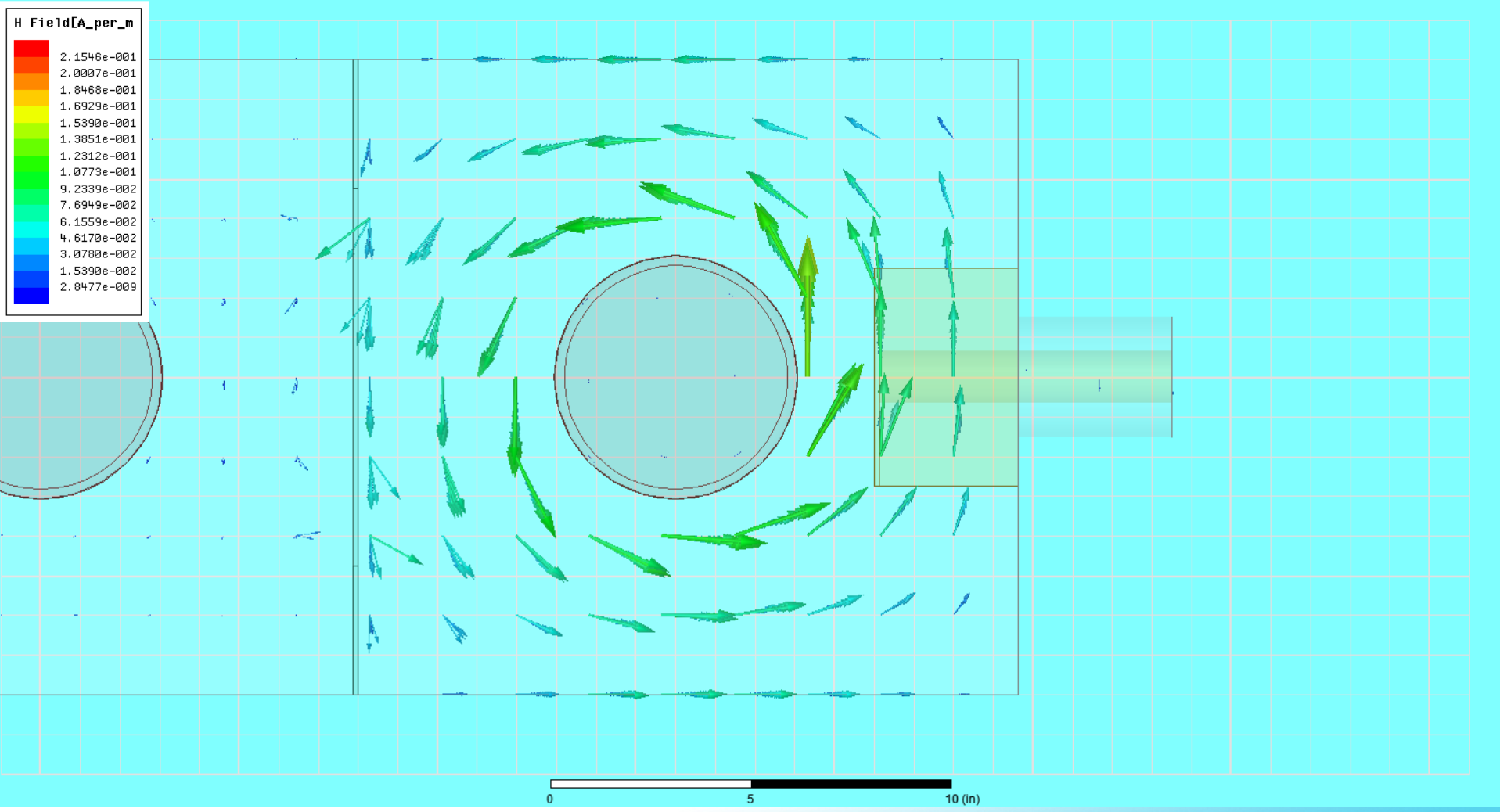


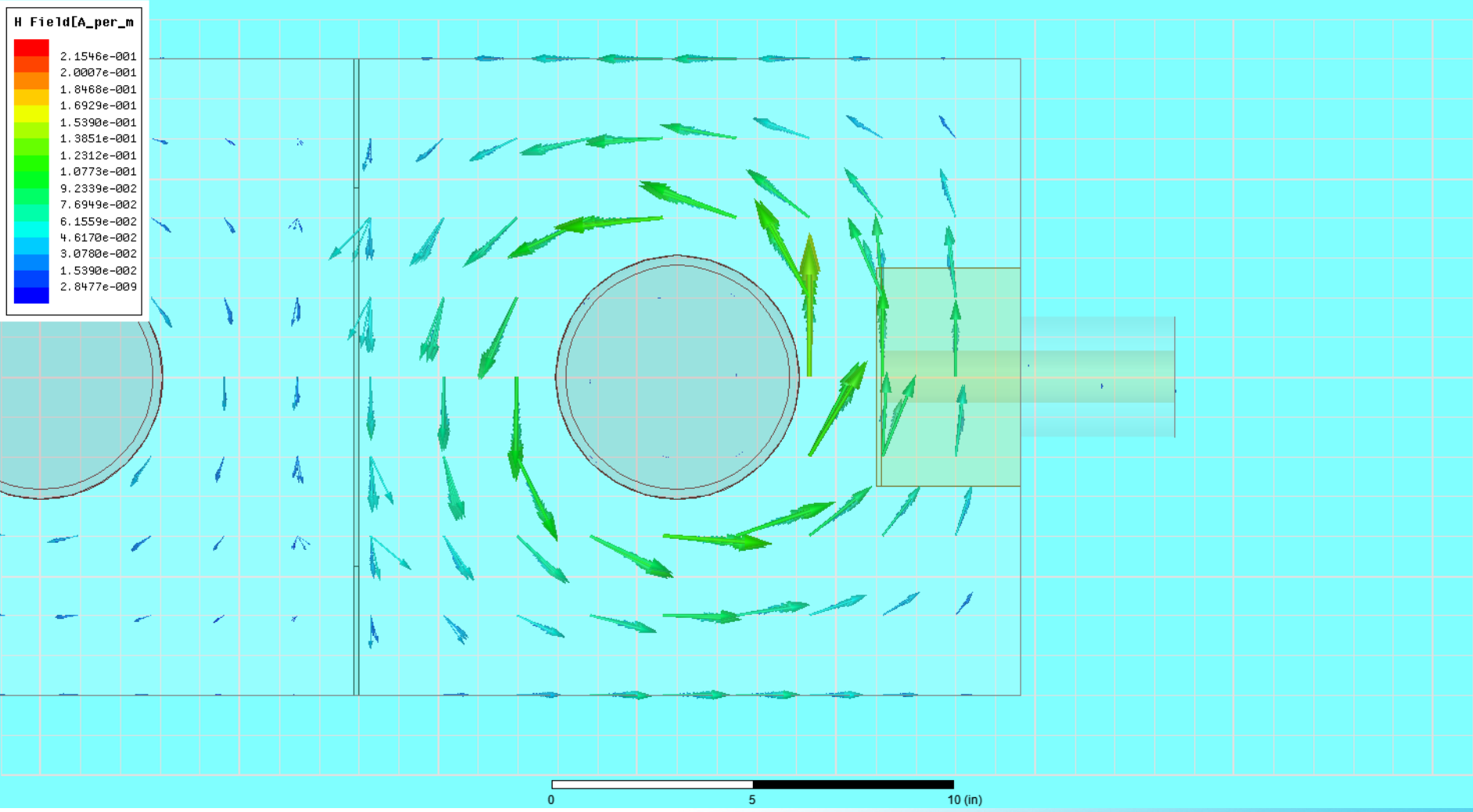
4 Cavity Filter

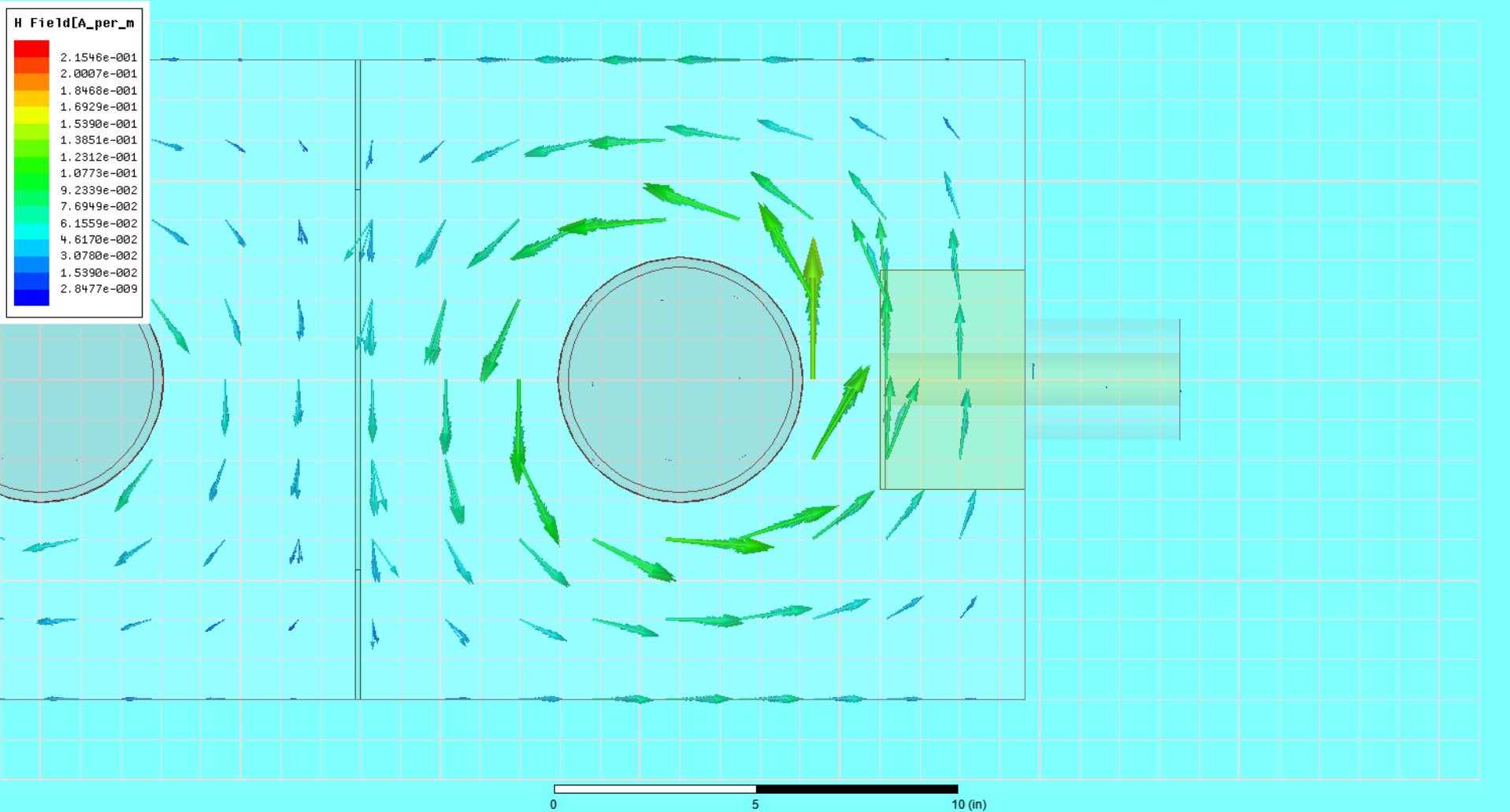


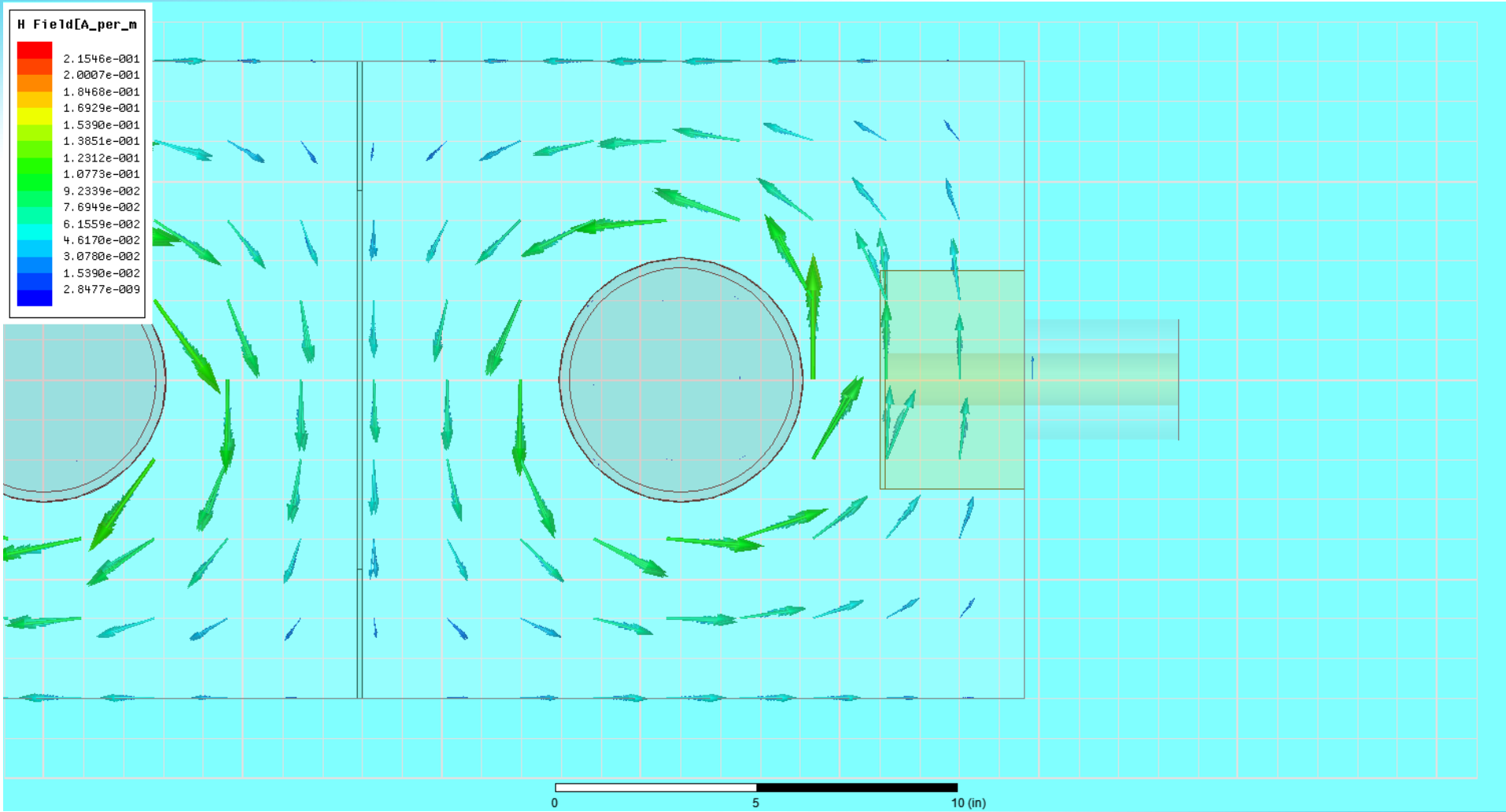


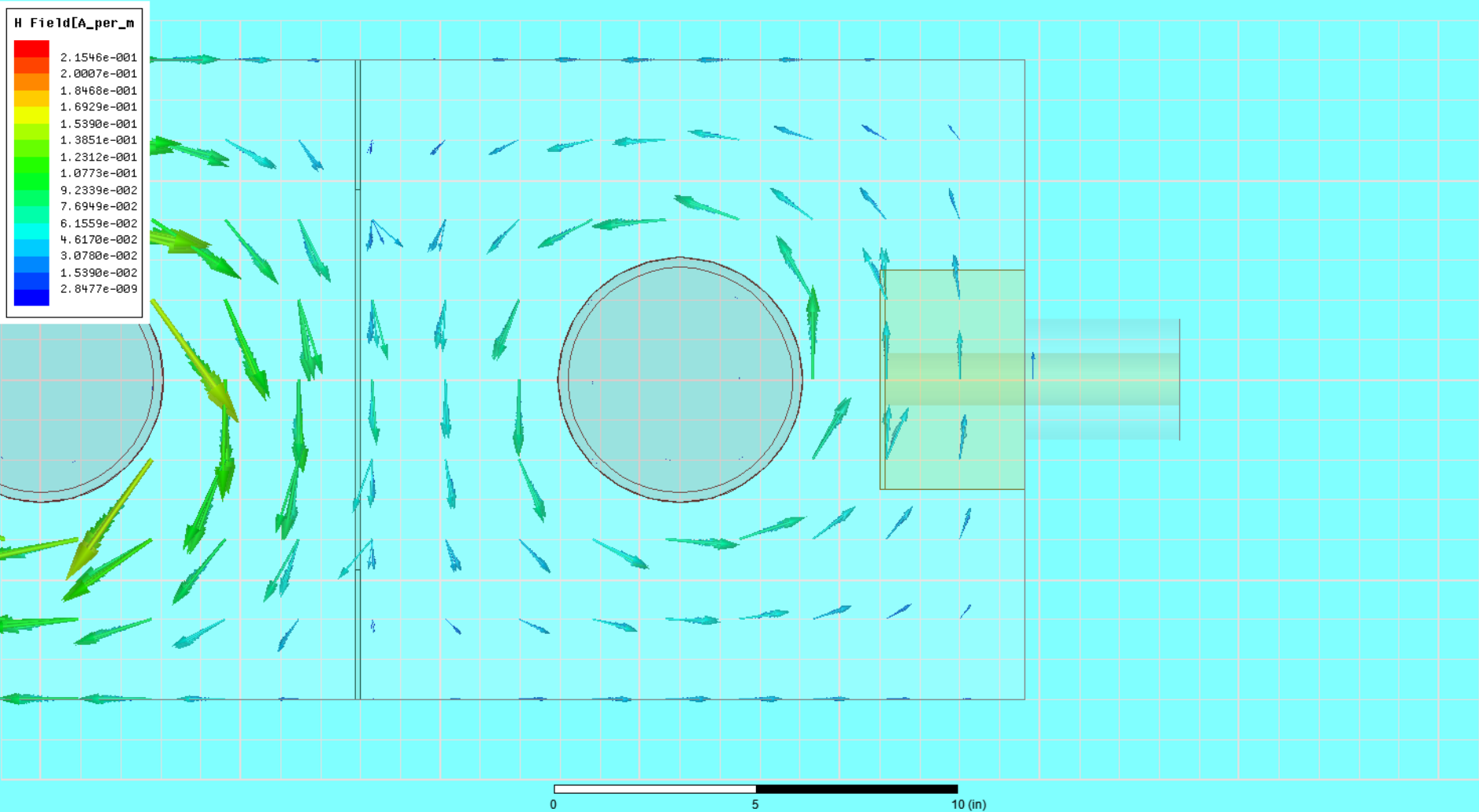


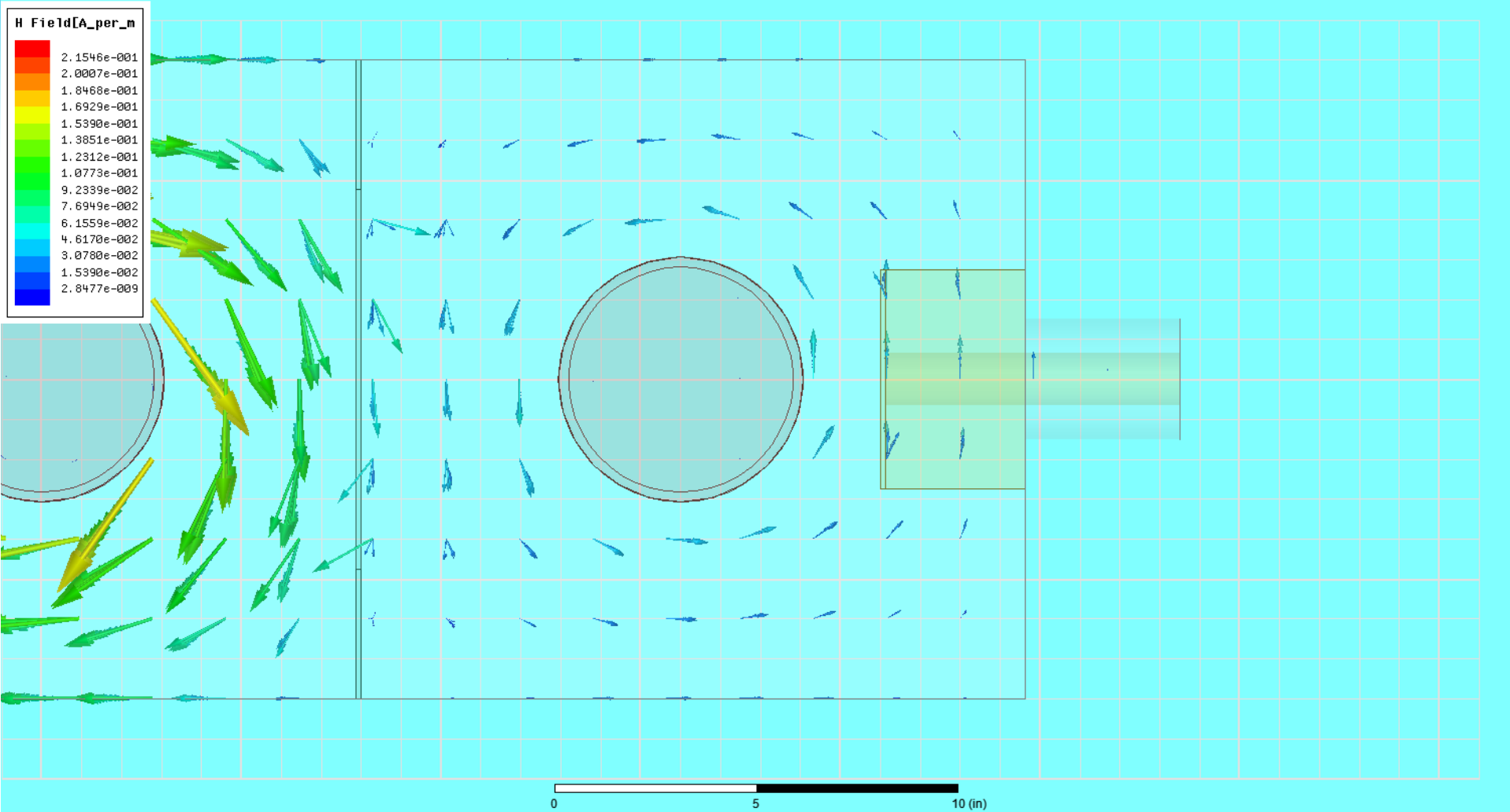


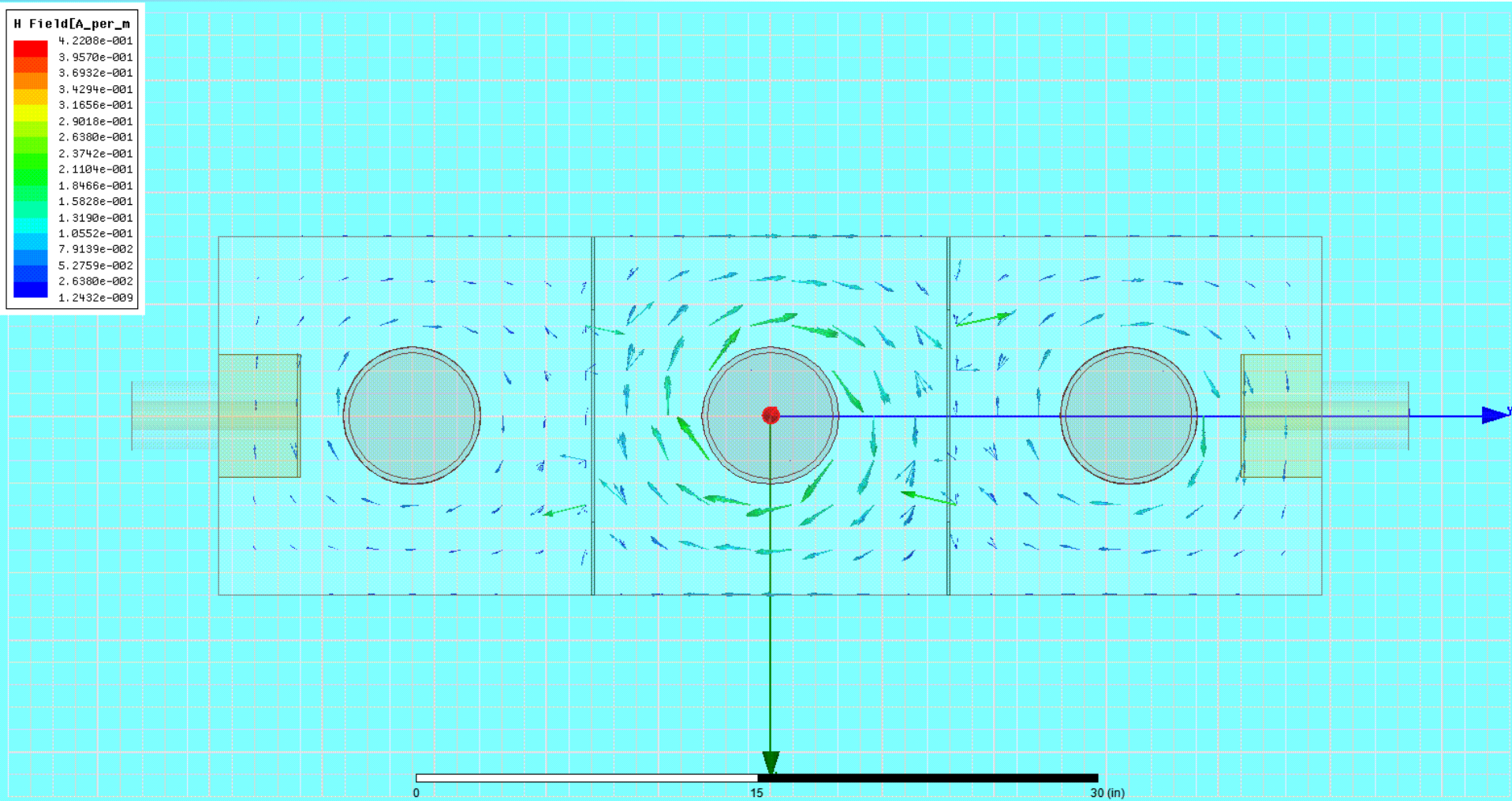


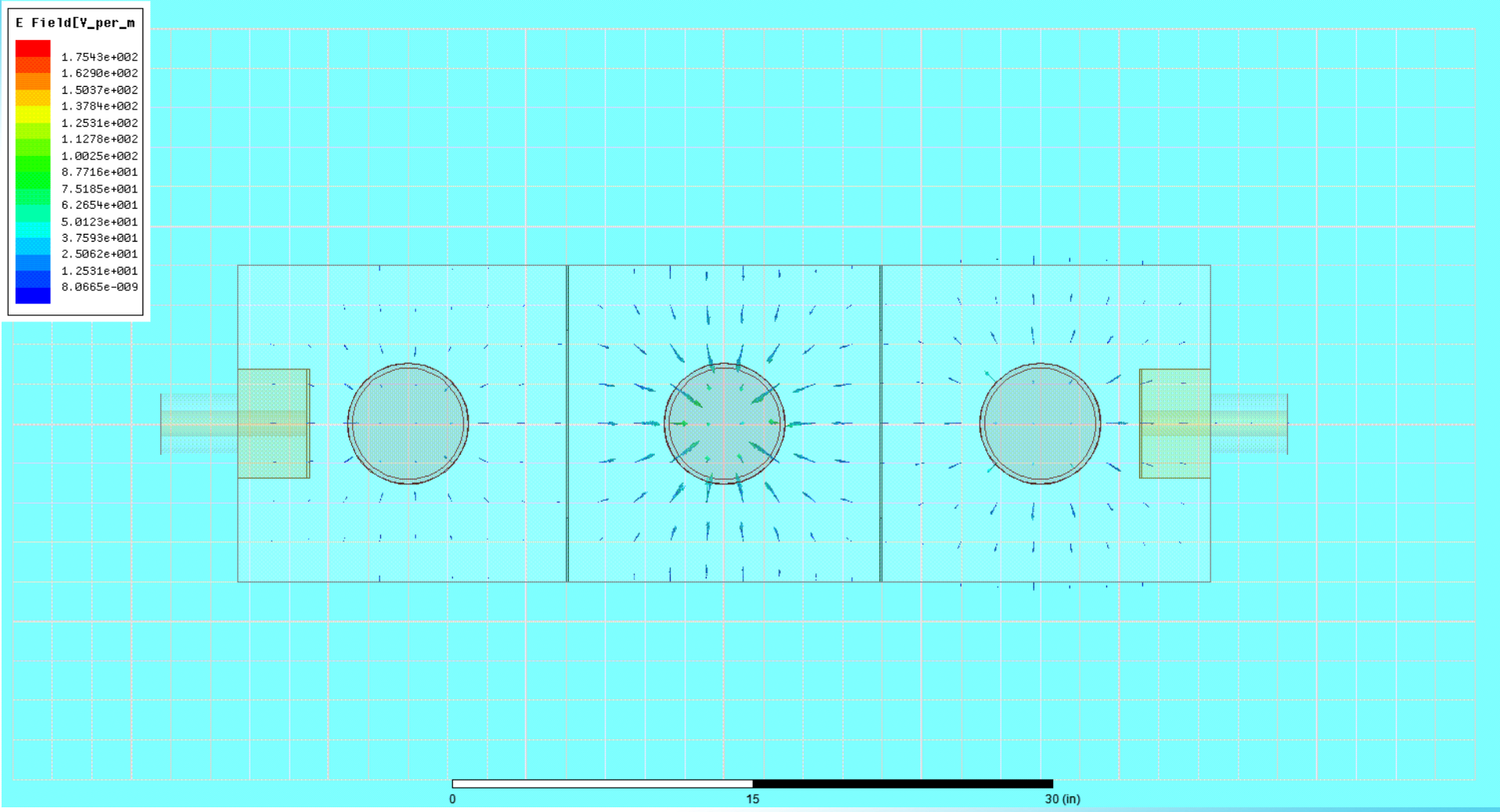


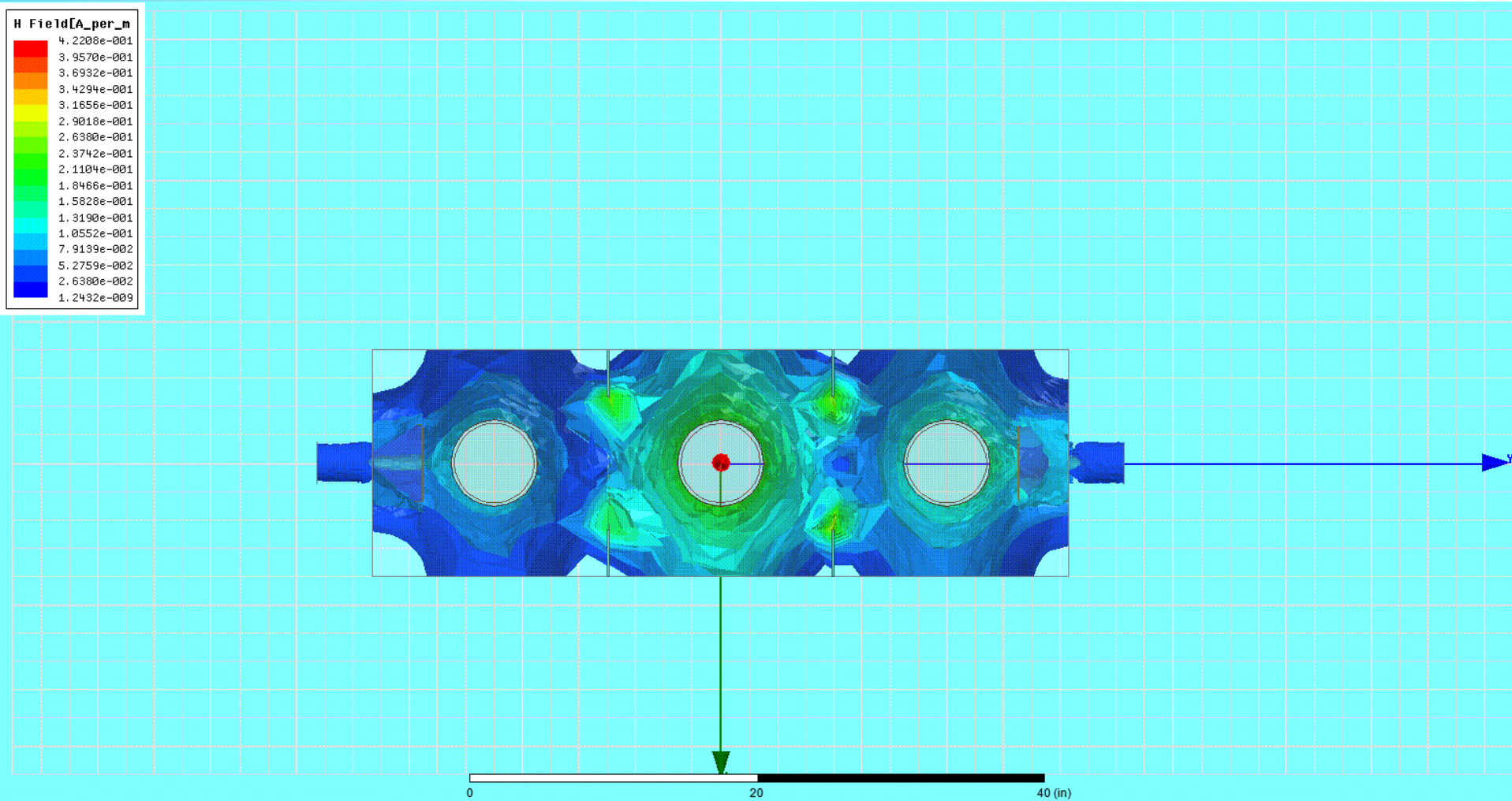




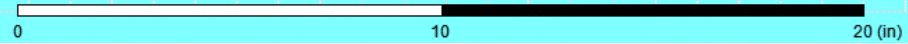
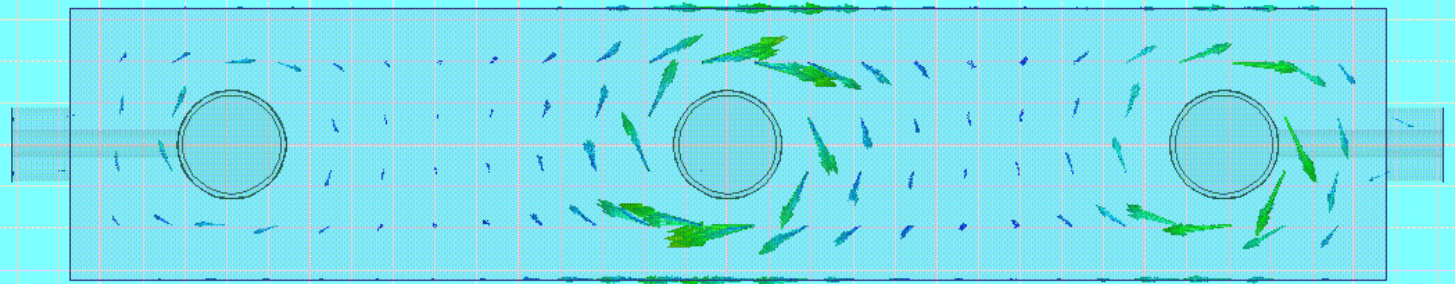


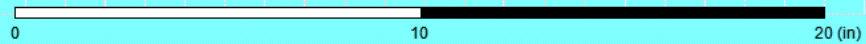
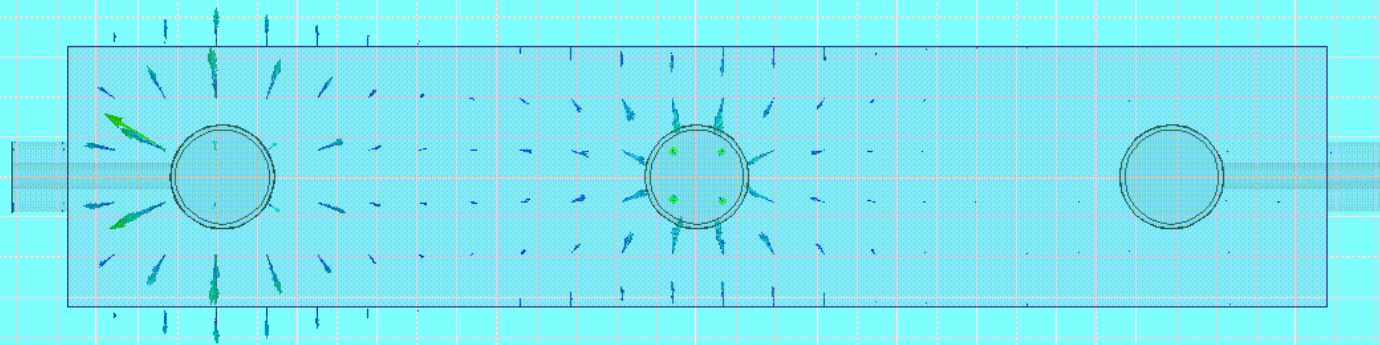


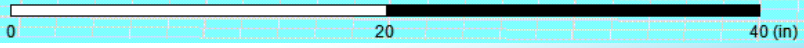
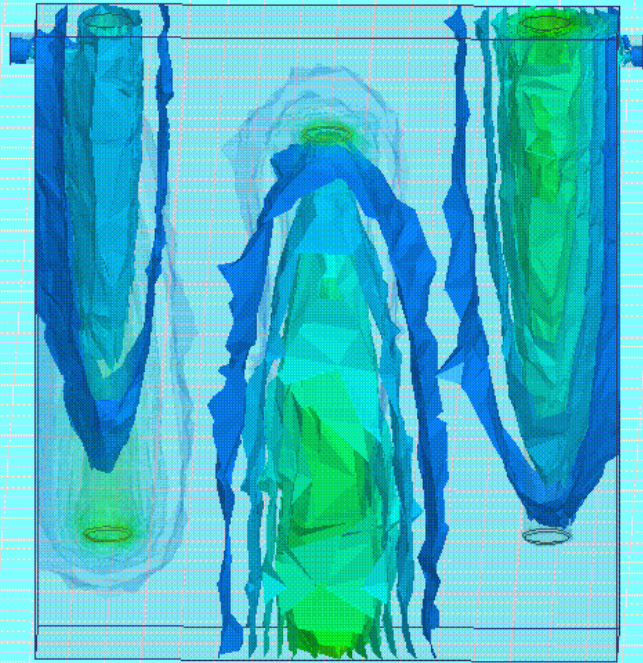










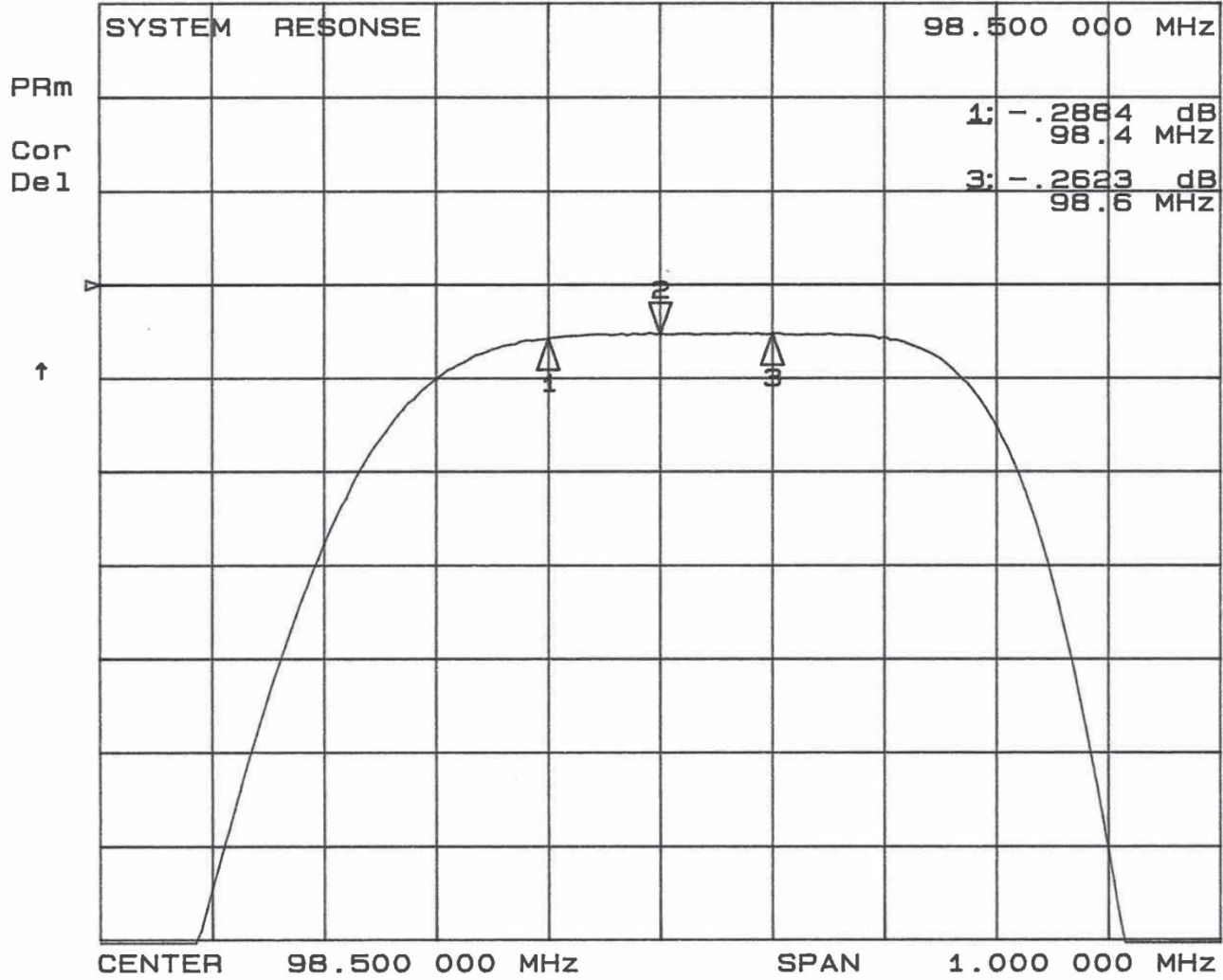


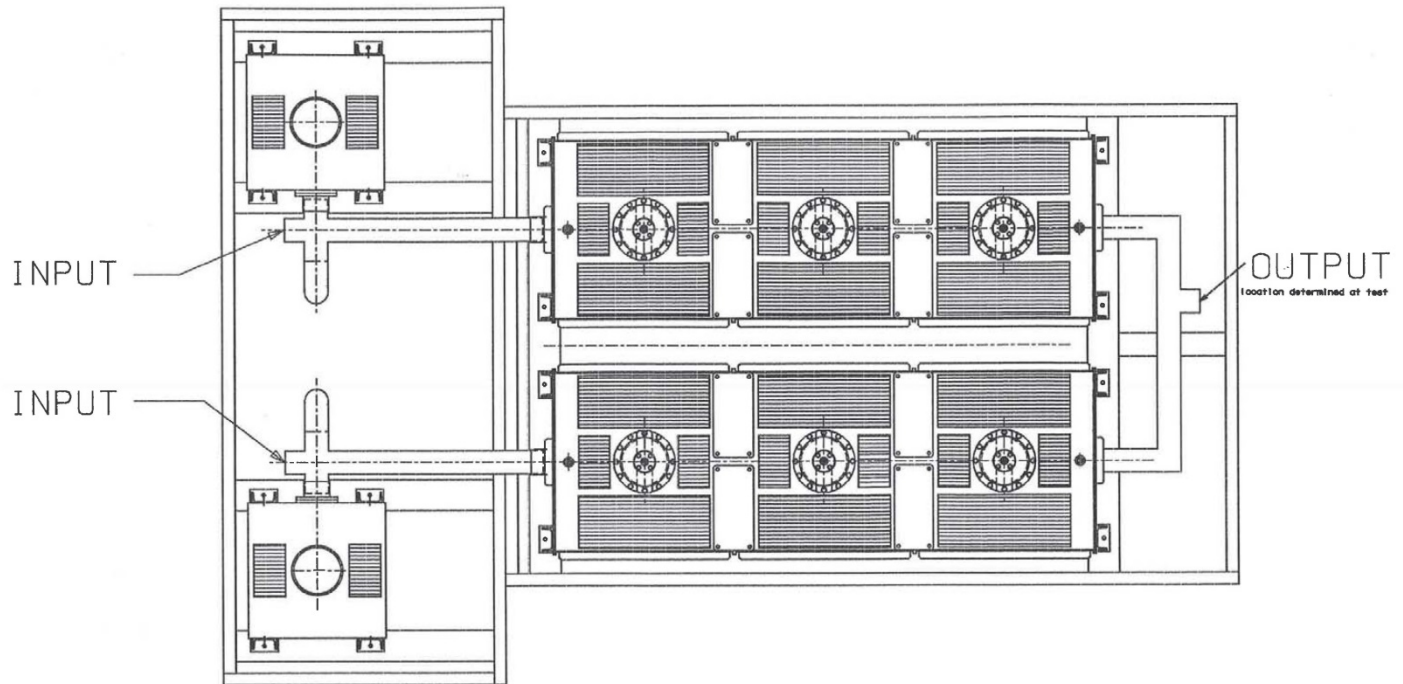
Questions



2 May 1995 09:23:09

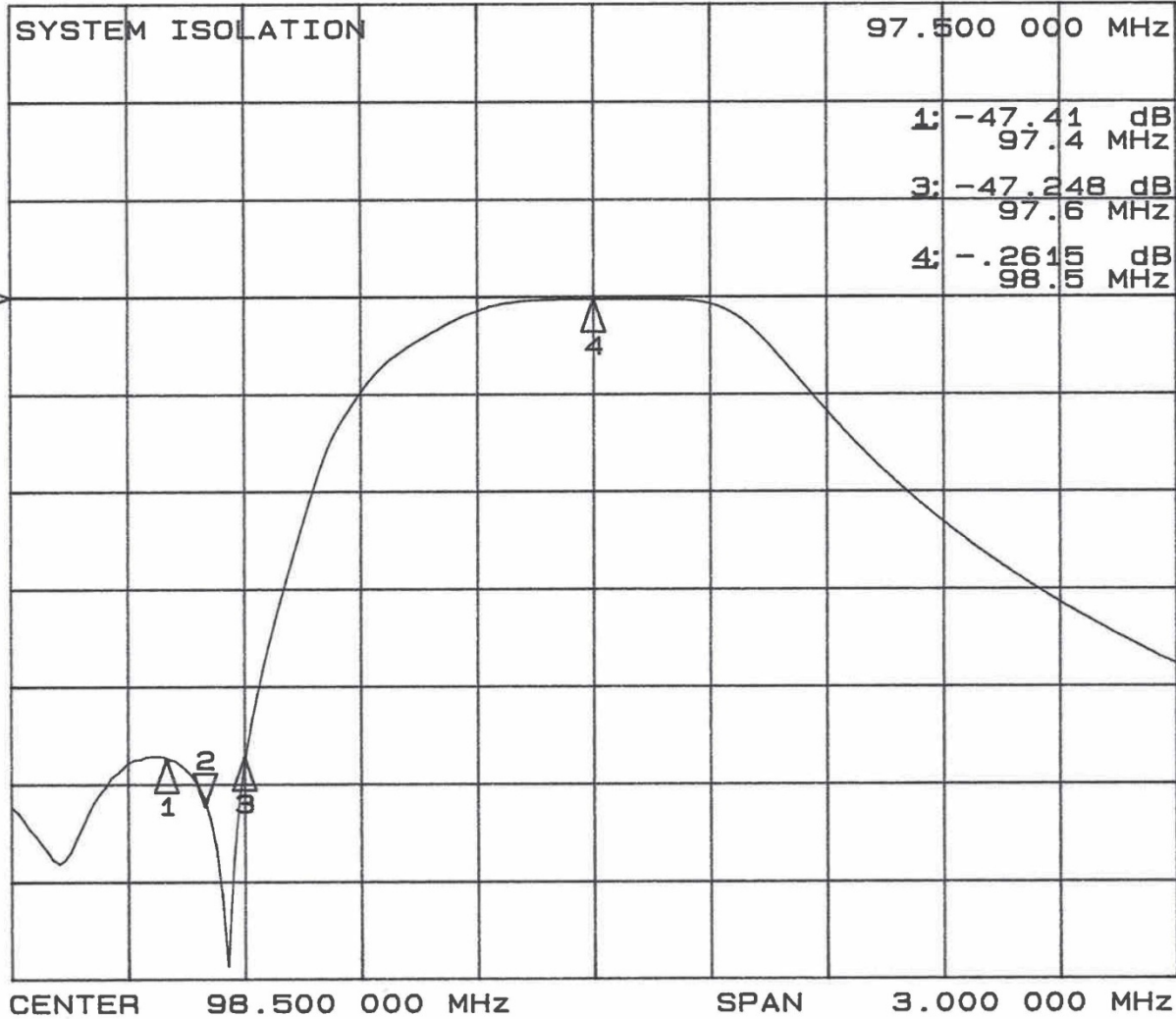
CH1 S₂₁ log MAG .5 dB/ REF 0 dB 2: -.2657 dB





2 May 1995 09:29:08

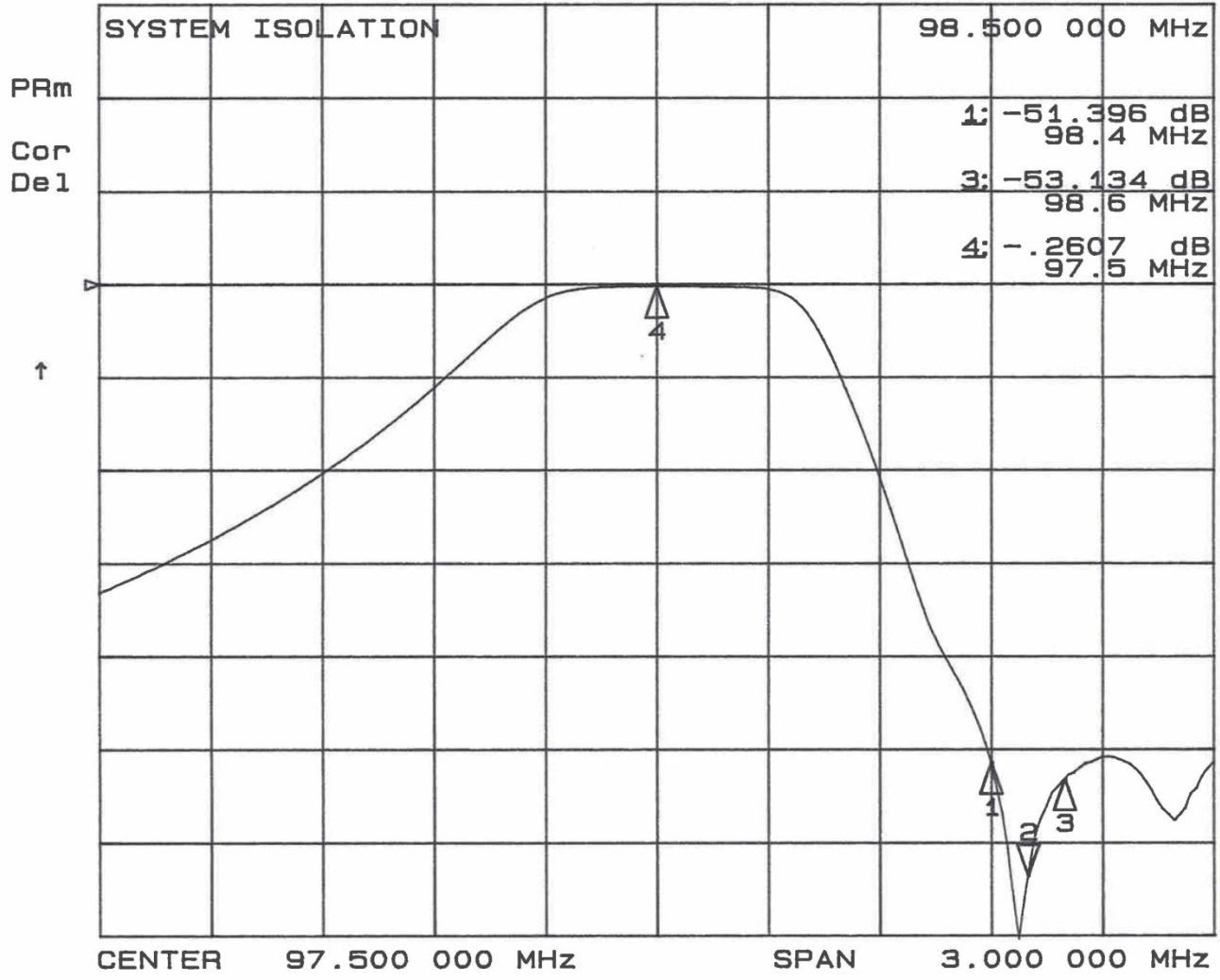
CH1 S₂₁ log MAG 10 dB/ REF 0 dB 2: -52.214 dB



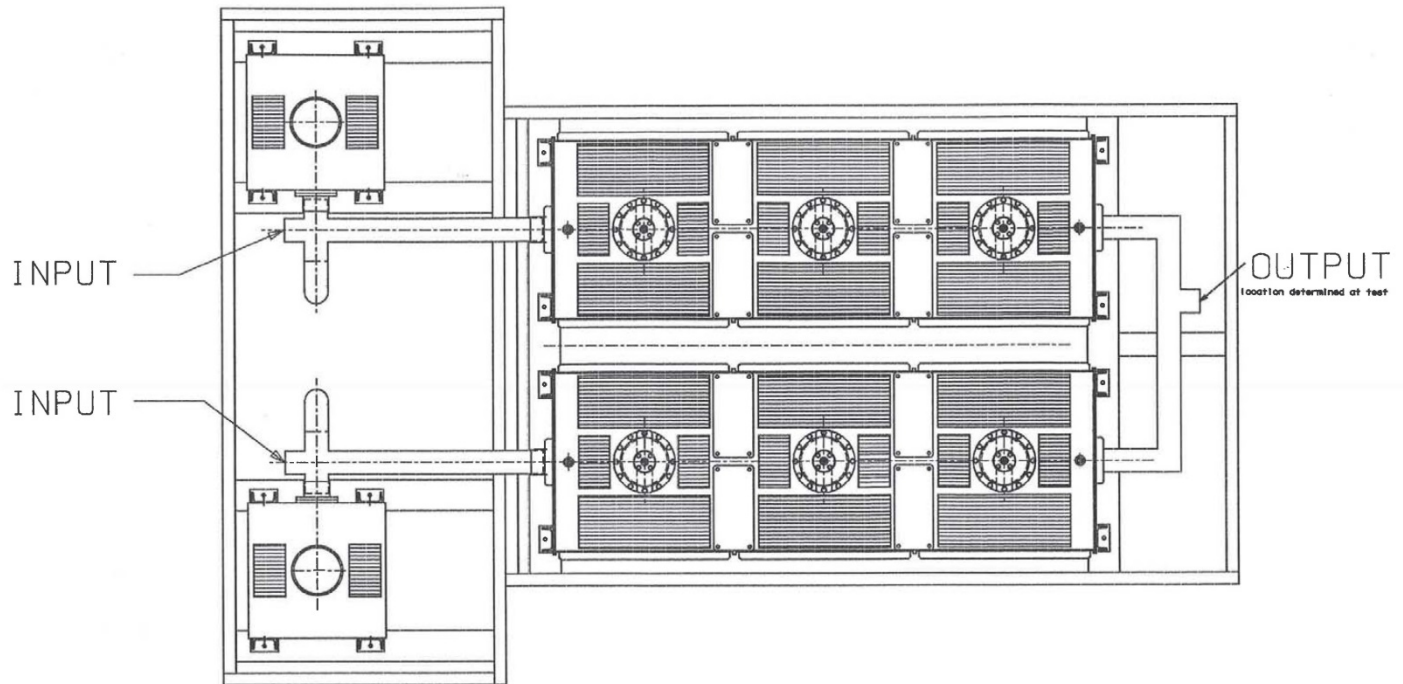
-50dB

2 May 1995 09:12:57

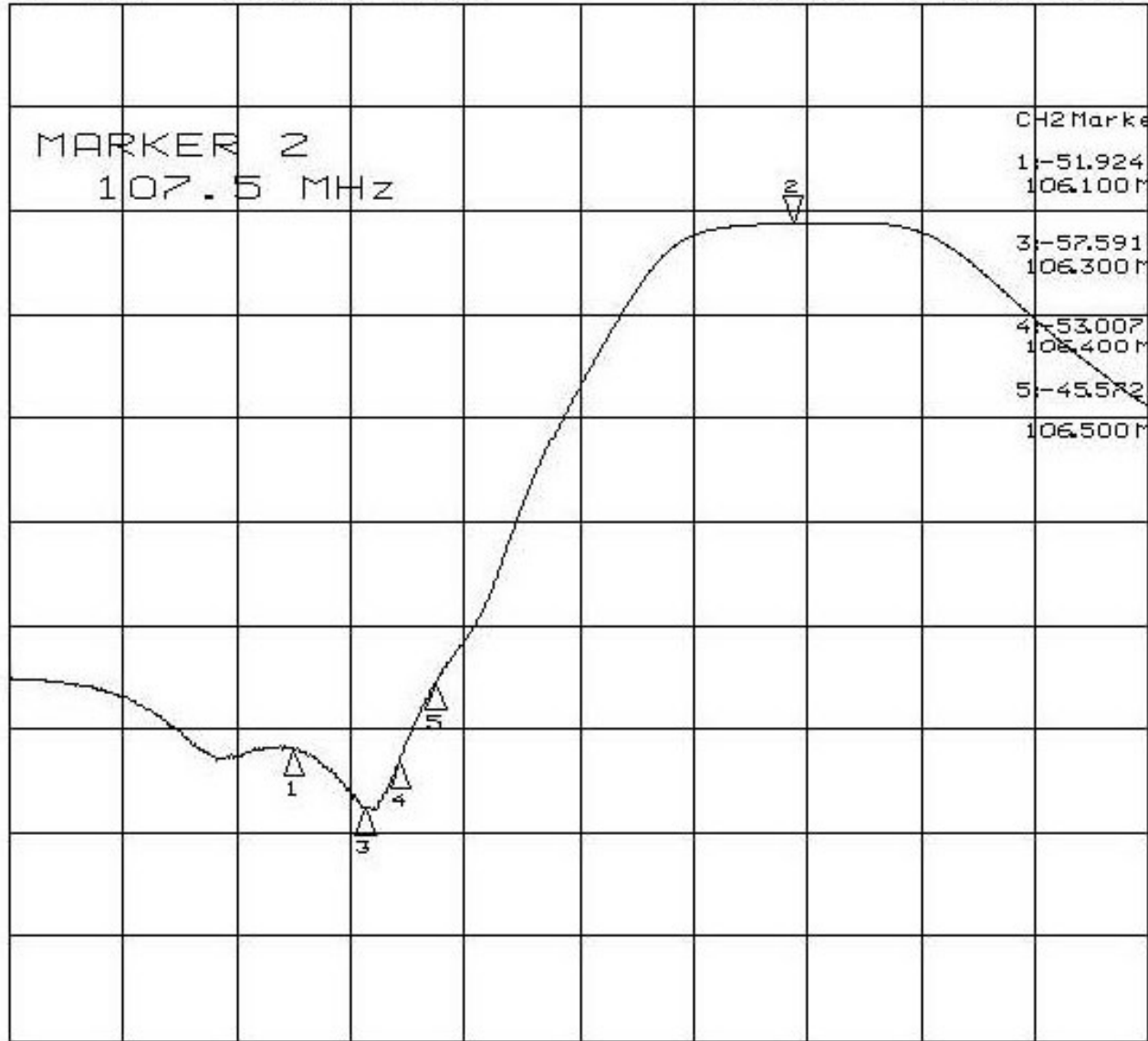
CH1 S₂₁ log MAG 10 dB/ REF 0 dB 2: -63.552 dB



-50dB



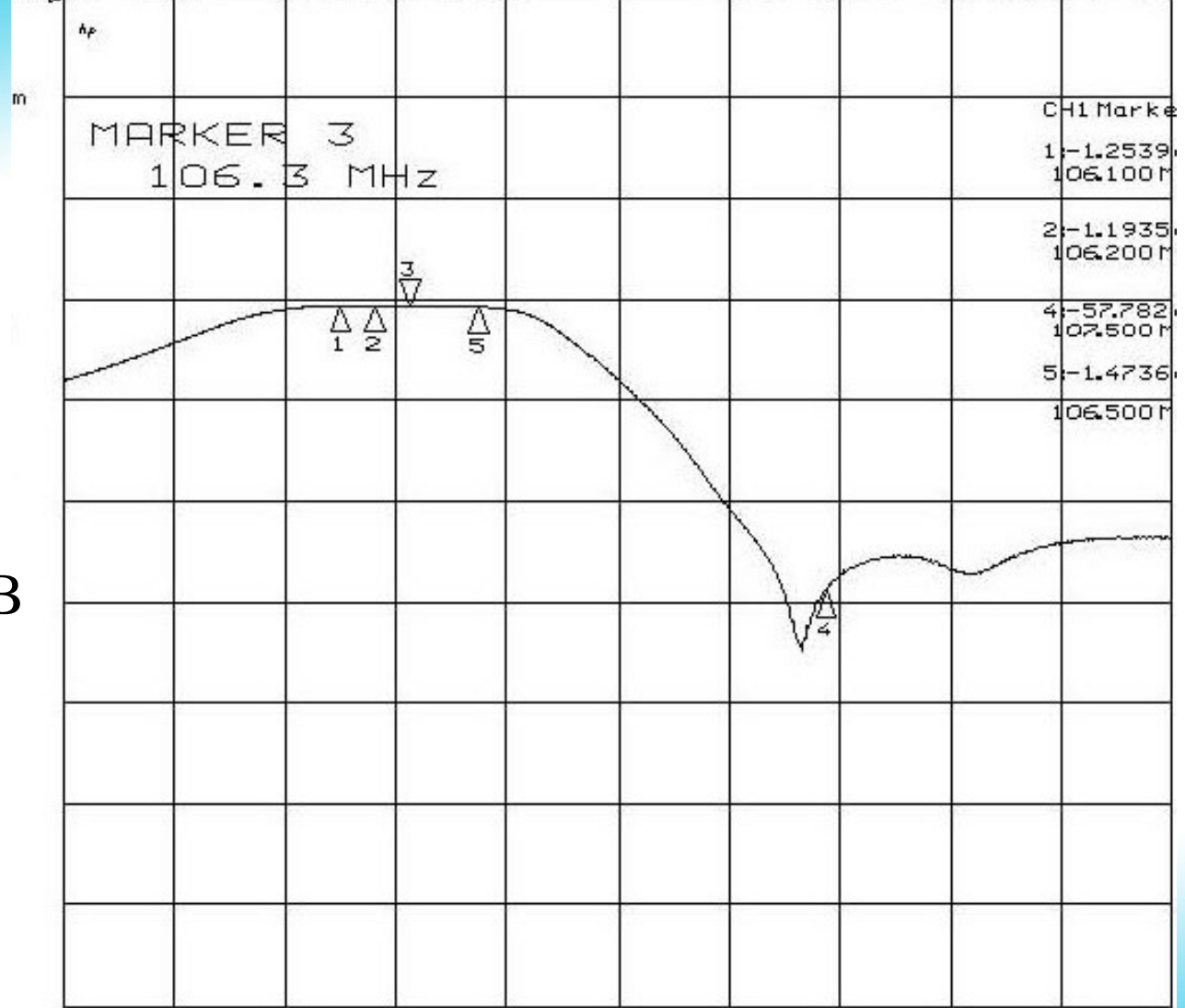




START 105.300 000 MHz

STOP 108.500 000 MHz

S21 L06 20 dB/REF 60 dB 3-1.2156dB 106.300000MHz



60 dB



104.5

$$B_1 = (F_2 - F_1)(K)$$

$$B_1 = (105.3 - 104.5)(4) = 3.2$$

$$A_1 = \text{ARCTAN}(-B_1) + 180^\circ$$

$$A_1 = -72.65 + 180^\circ = 107.35$$

$$L_1 = \frac{A_1}{360} L_2 - Z$$

$$L_1 = \frac{107.35}{360} (2 @ 105.3) - 17 = 33.42 - 17 = \boxed{16.42}$$

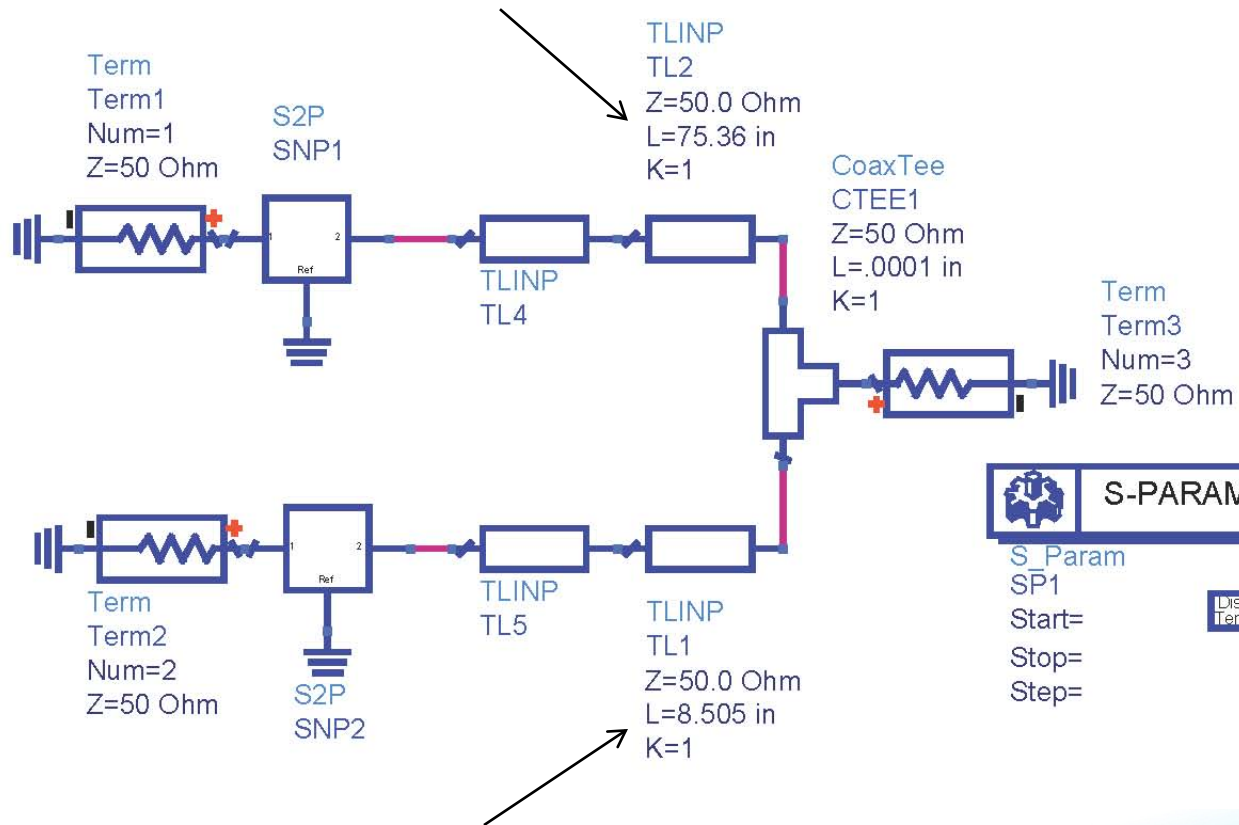
105.3

$$B_2 = (F_2 - F_1)(4) = -3.2$$

$$A_2 = \text{ARCTAN}(-B_2) = 72.64$$

$$L_2 = \frac{A_2}{360} (2 @ 104.5) - 17 = 5.79$$

$$L_2 = 5.79 + 180^\circ = 5.79 + 56.47 = \boxed{62.26}$$



S-PARAMETERS

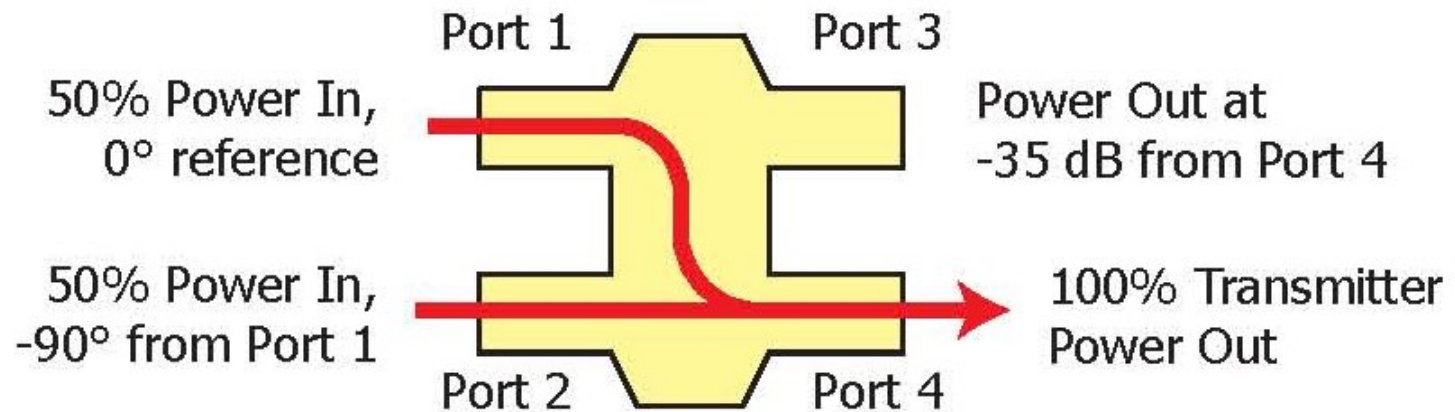
S_Param
SP1
Start=
Stop=
Step=

Disp
Tempo DisplayTemplate
disptemp2
"S_Params_Quad_dB_Smith"

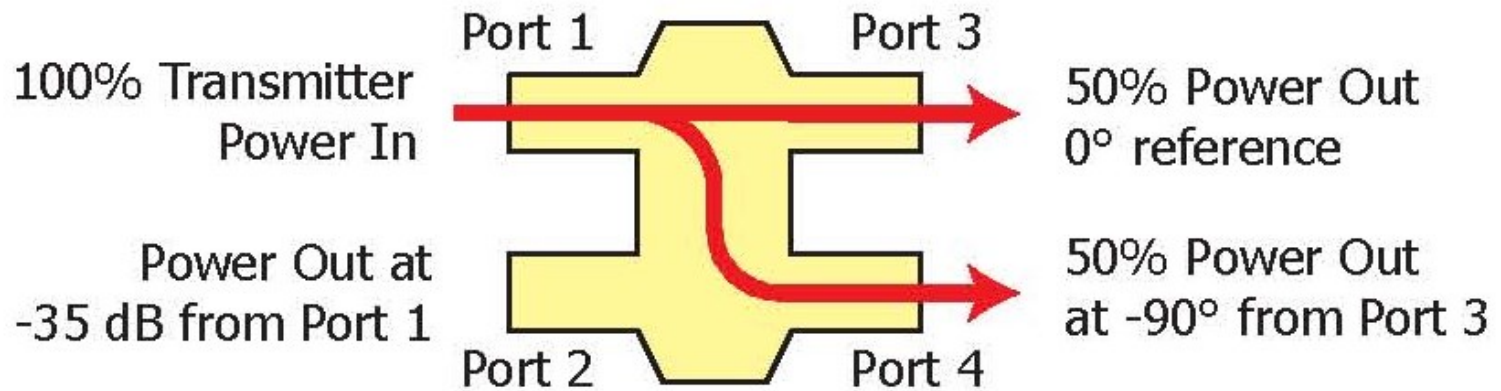


Questions

Building Block of Balanced Combining



Building Block of Balanced Combining



Balanced Combining Hybrid Ring

Commutating Line Combiner

Run Out Combiner

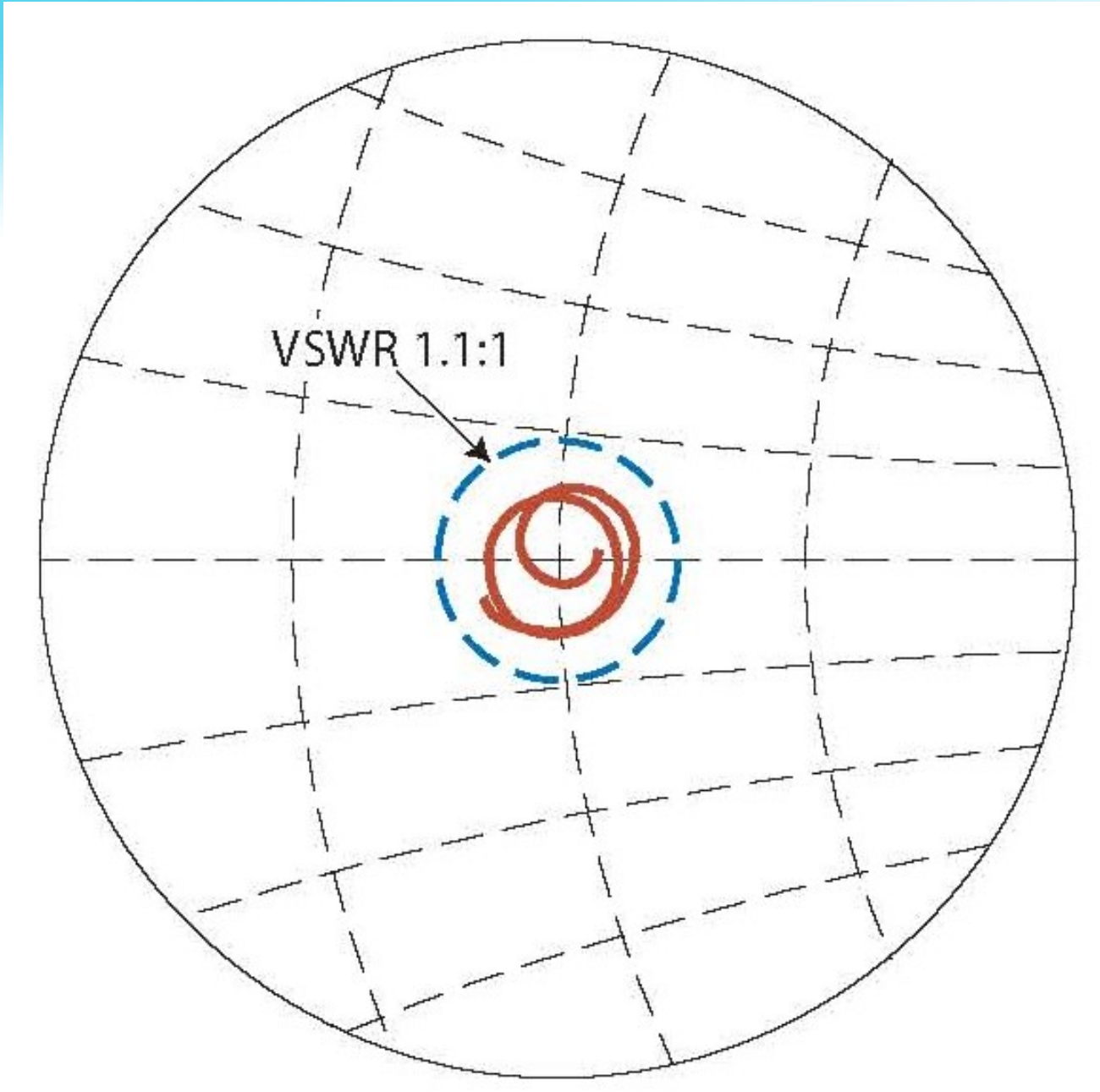


$$f1 \text{ low} - f2 \text{ high} = \Delta f$$

$$11803 / (\Delta f \times 2) = \text{Length added}$$

TX low – TX high = Δf

$11803 / \Delta f \times 2 =$ Length added to
High frequency



Thank You!