

The logo for EDICON 2018, featuring the text "EDI" in black and "CON" in white on a blue background, with "2018" in red below it.

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2018

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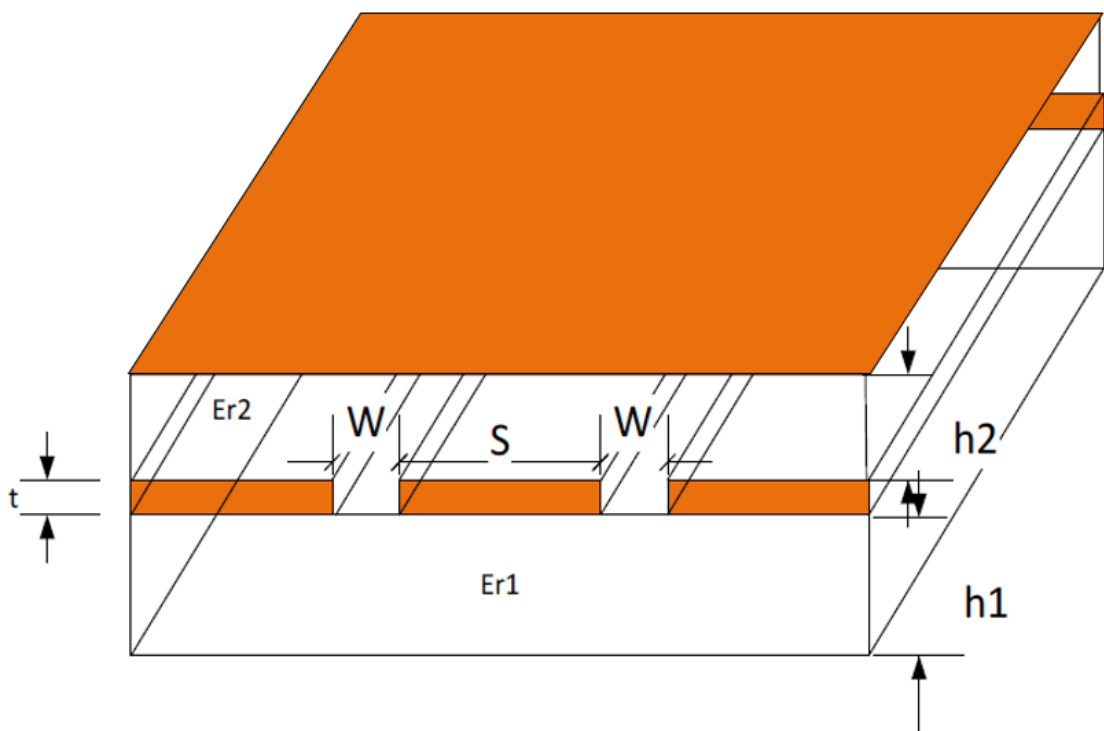
The event date and location information, including the dates "October 17-19 2018" and the venue "Santa Clara Convention Center, Santa Clara, CA".

October 17-19 2018  
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Santa Clara, CA

# Comparison of Embedded Coplanar Waveguide and Stripline for Multi-Layer Boards

Mohanad Abulghasim, Justin  
Tabatchnick, and Milica Markovic

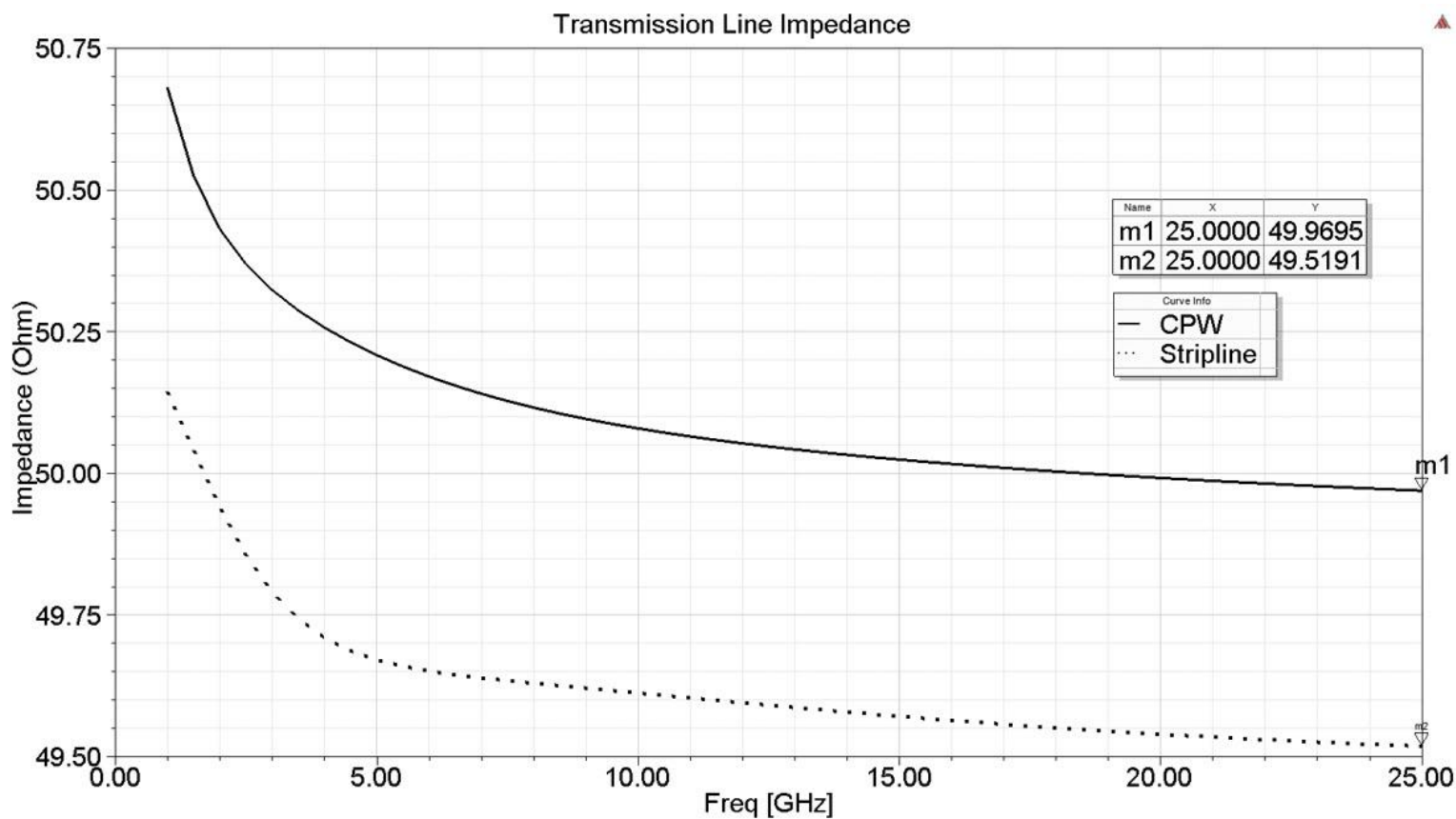
# Design Equations



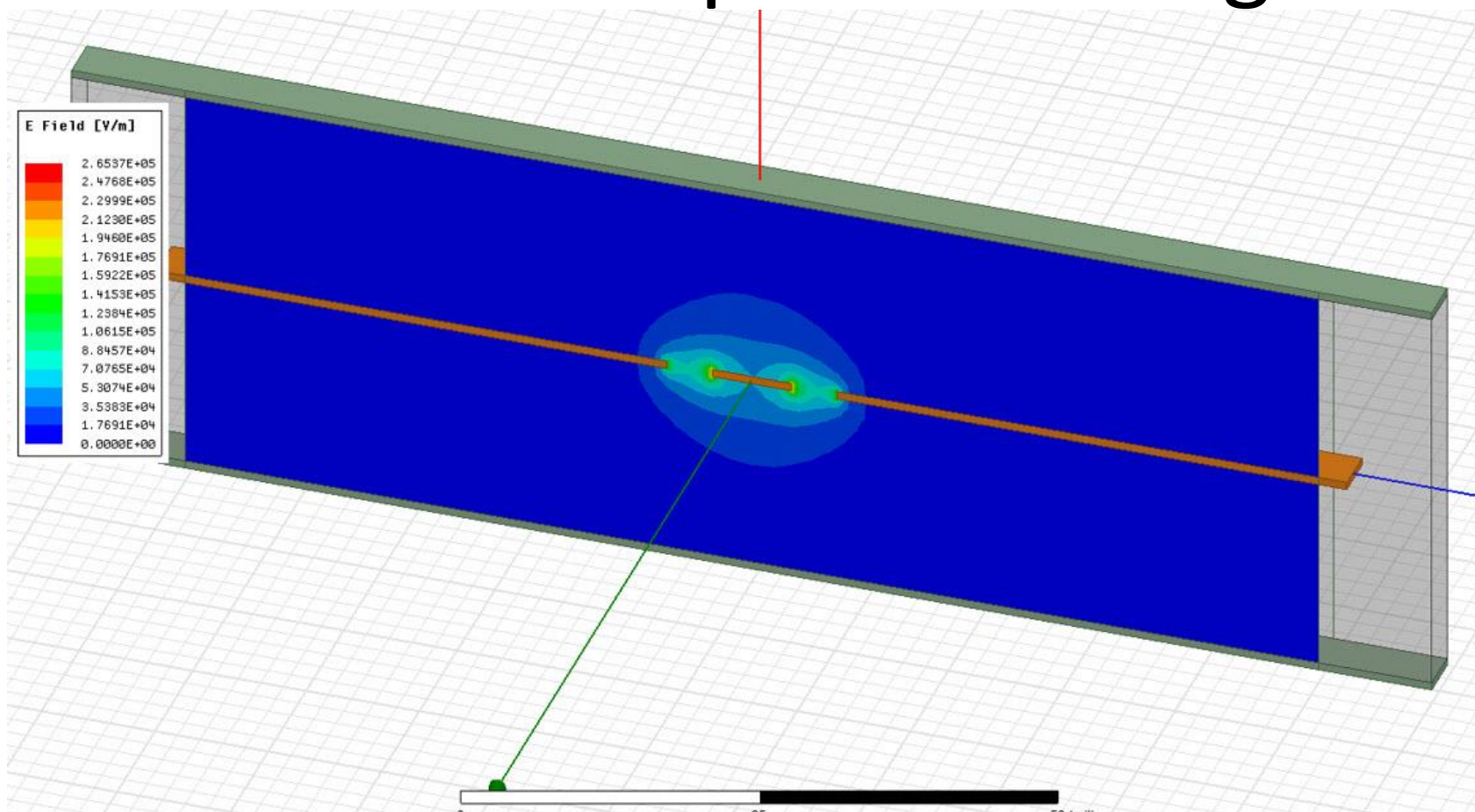
$$Z_0 = \frac{30\pi}{\sqrt{\epsilon_{\text{eff}}}} \left( \frac{K(k_0')}{K(k_0)} \right)$$

R. N. Simons, "Coplanar waveguide circuits, components, and systems. 2001."

# Transmission Line Impedance

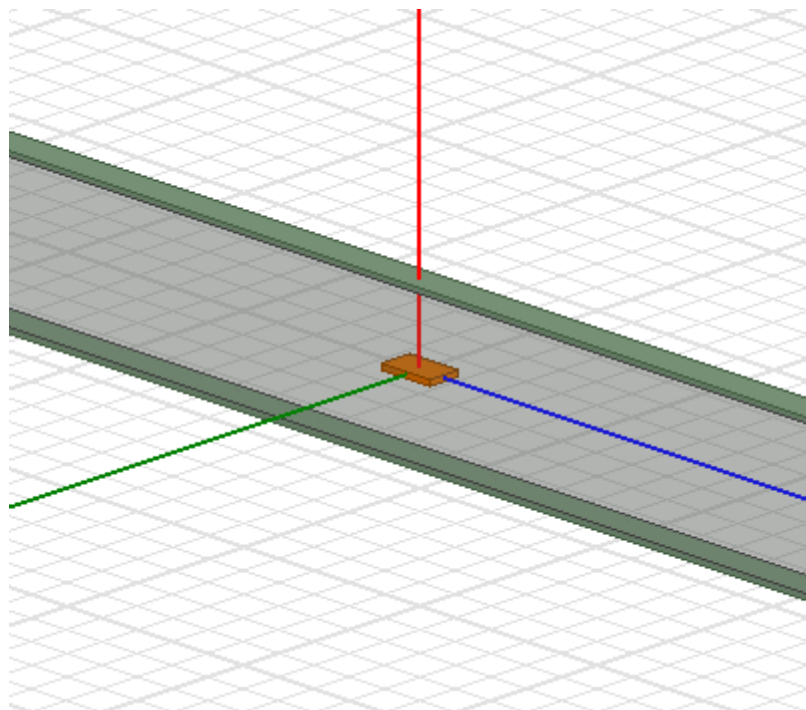


# Embedded Coplanar Waveguide



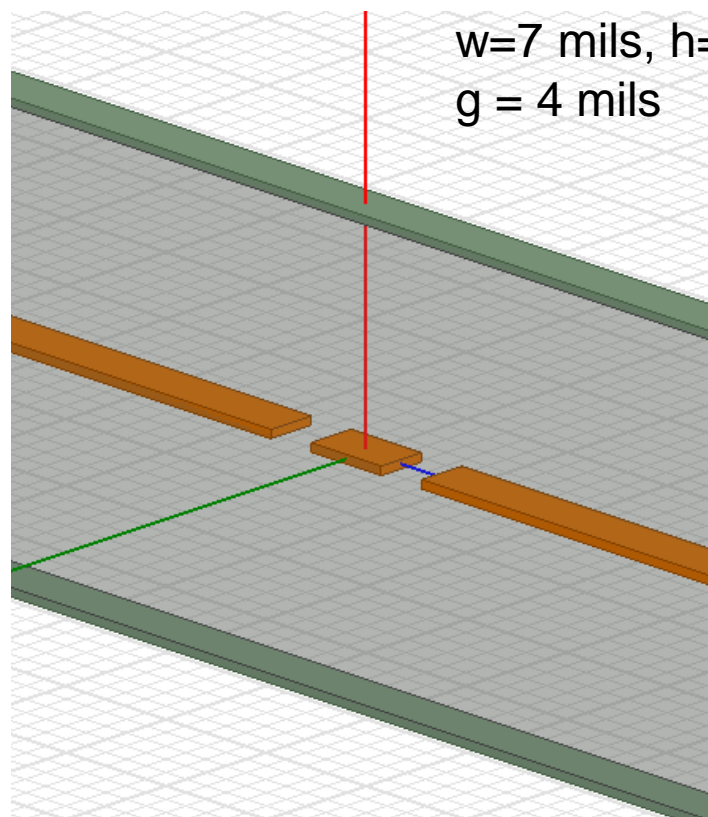
# Stripline

$w=7$  mils  $h=9$  mils



# CPW

$w=7$  mils,  $h=16$  mils  
 $g = 4$  mils



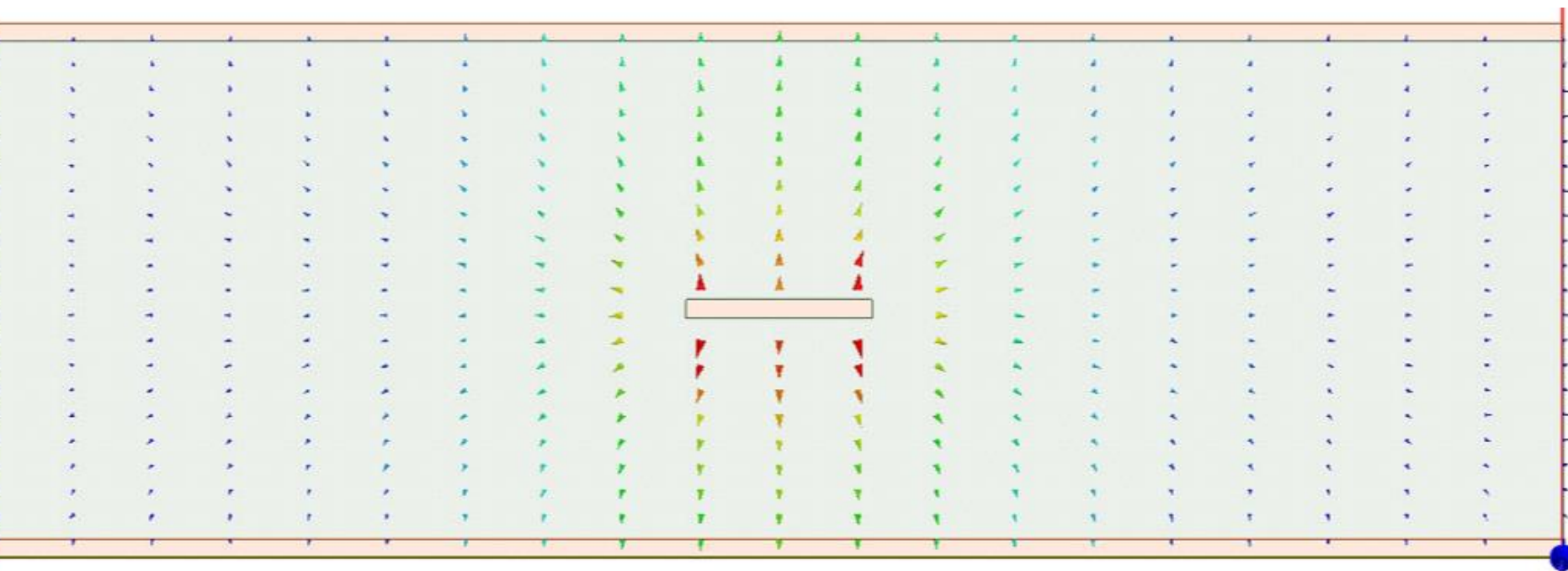
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# Stripline mode



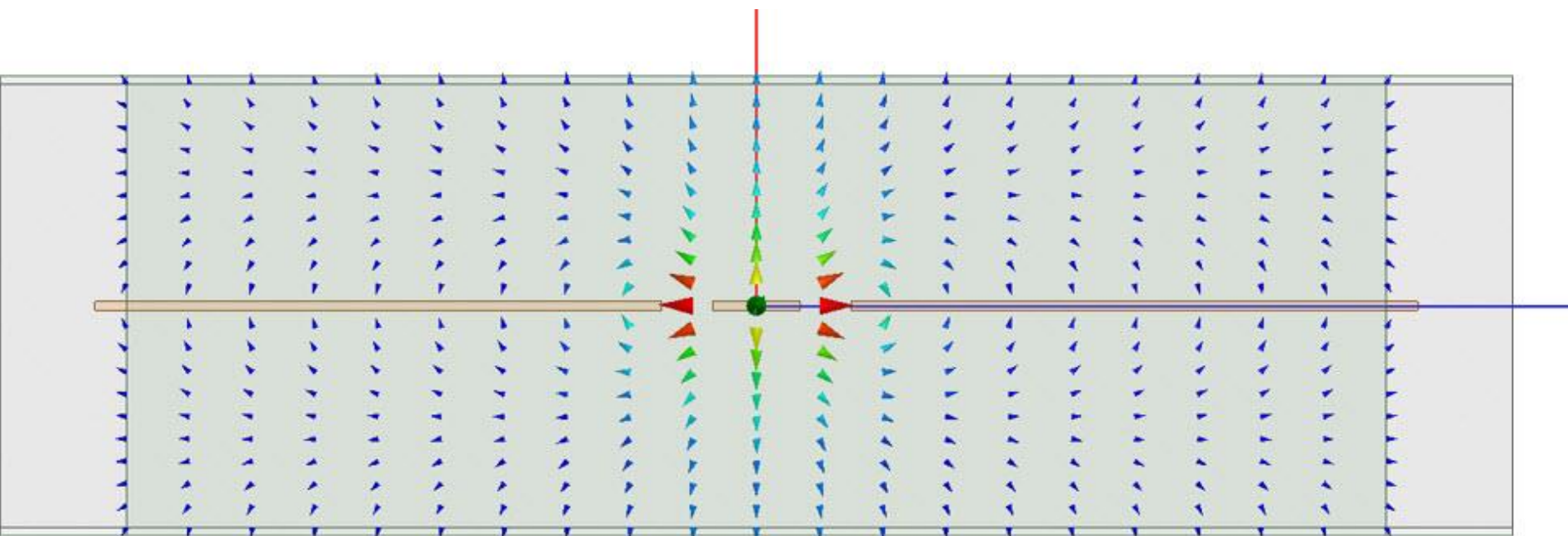
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# CPW mode



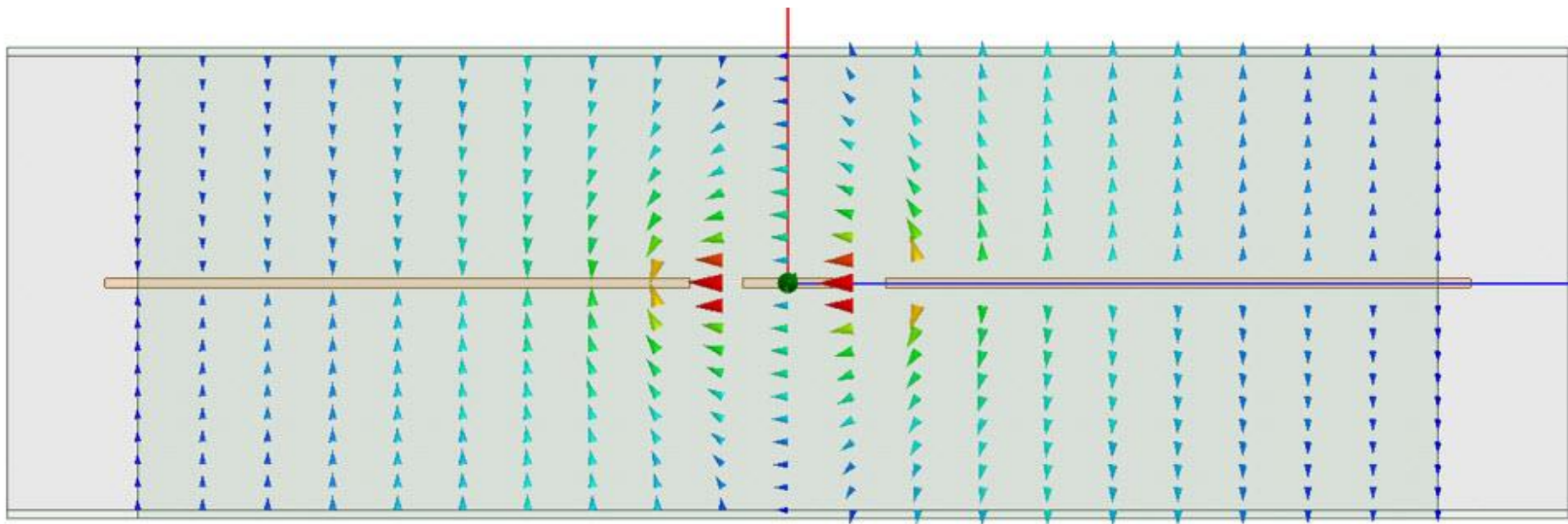
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# CPW Slotline Mode







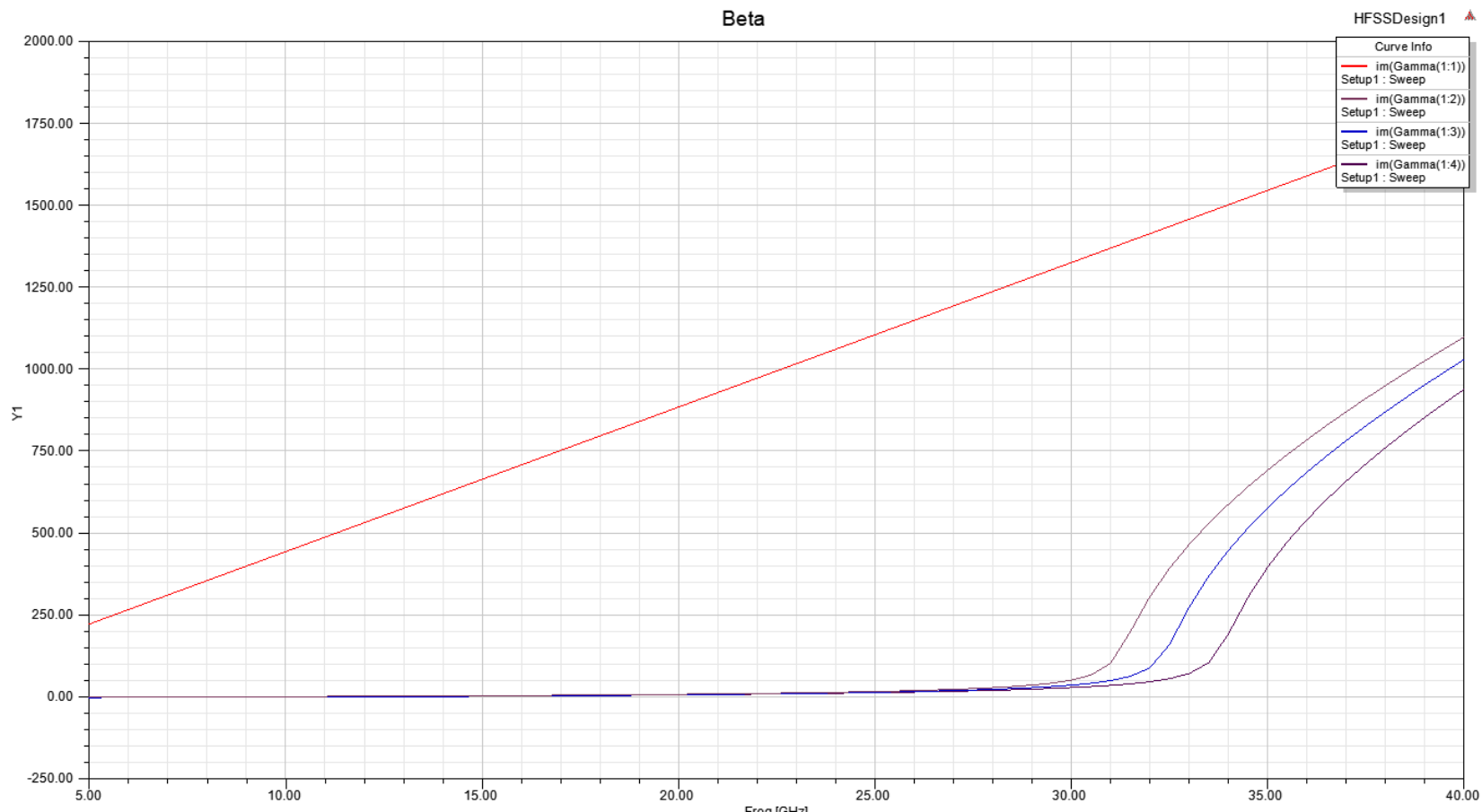
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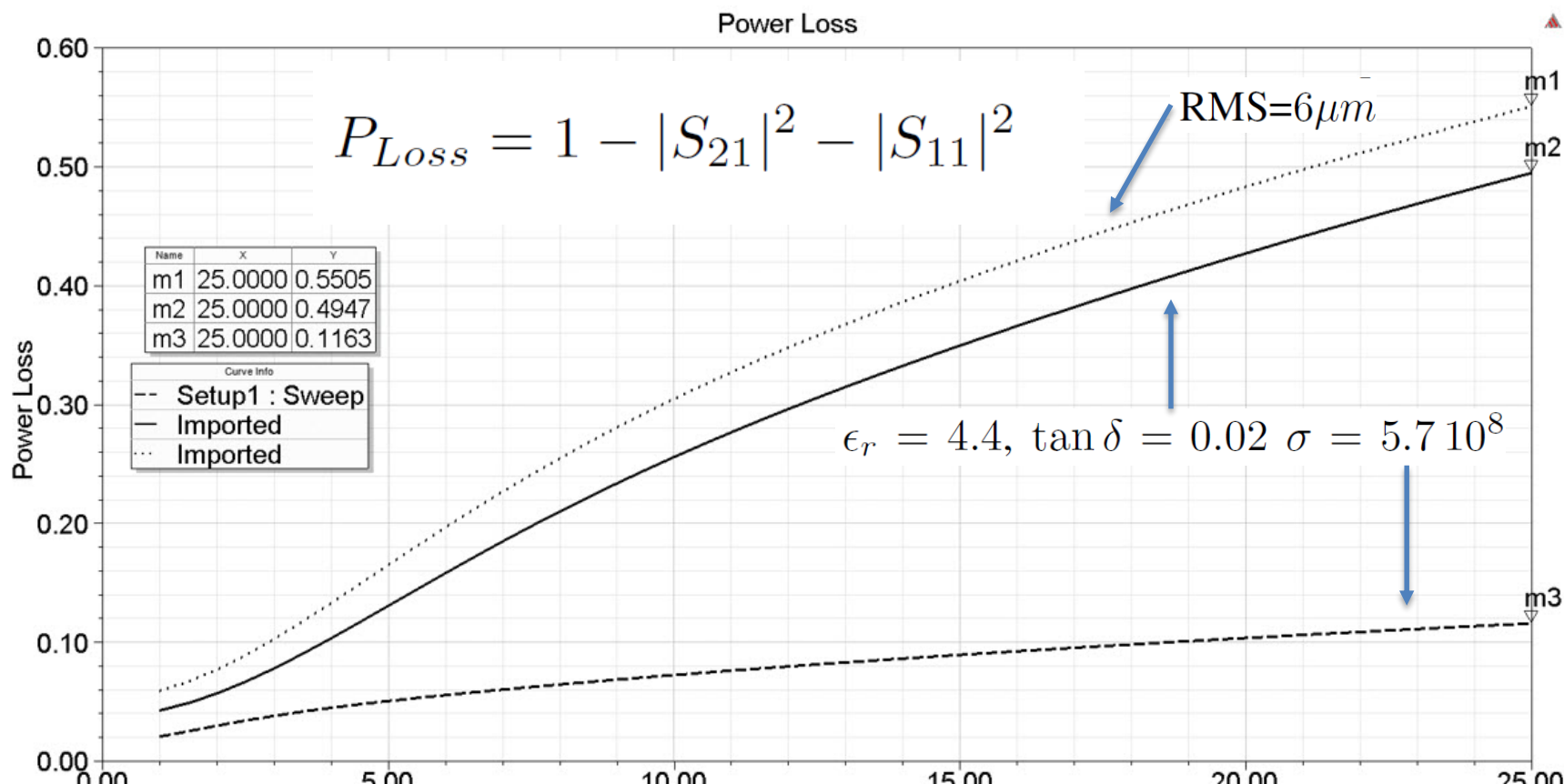
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# Propagation Modes

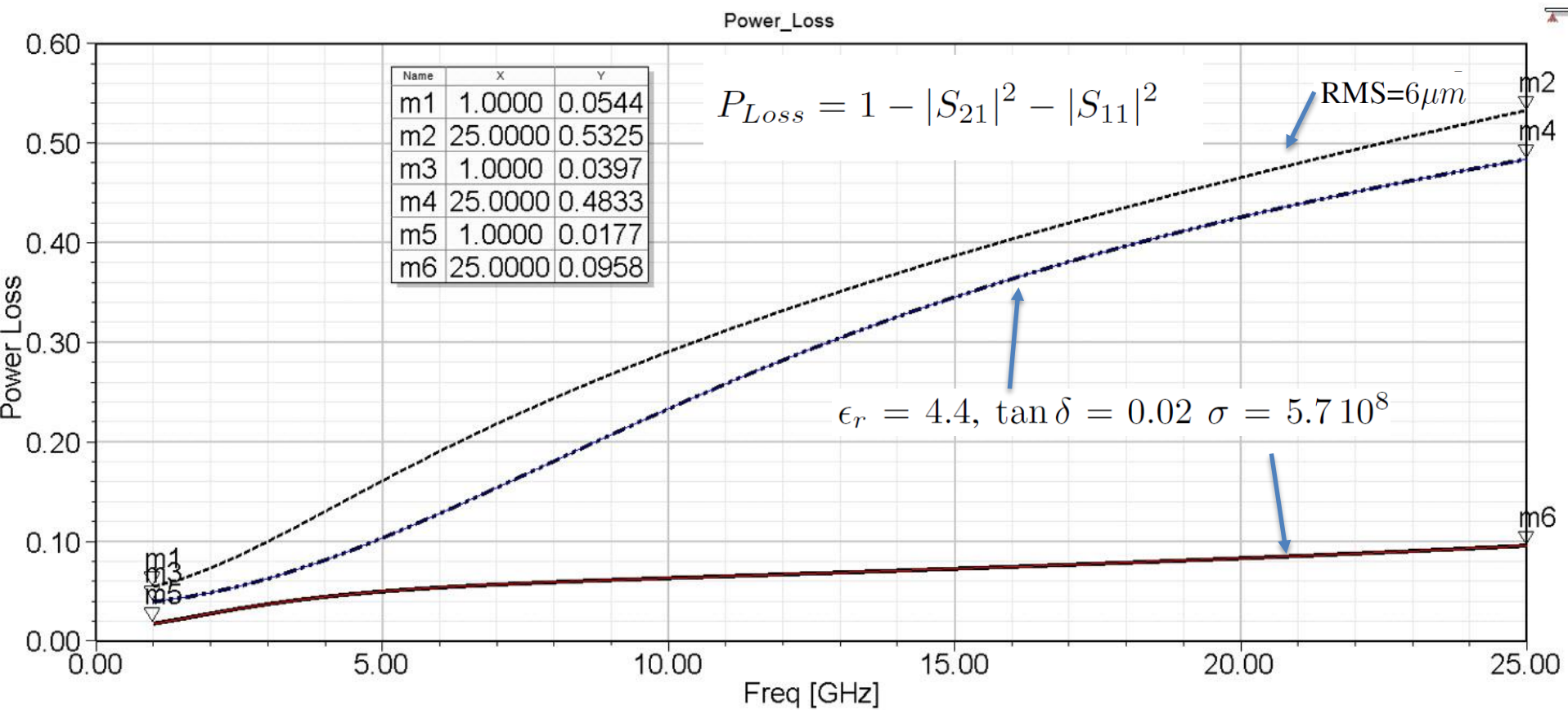
Beta



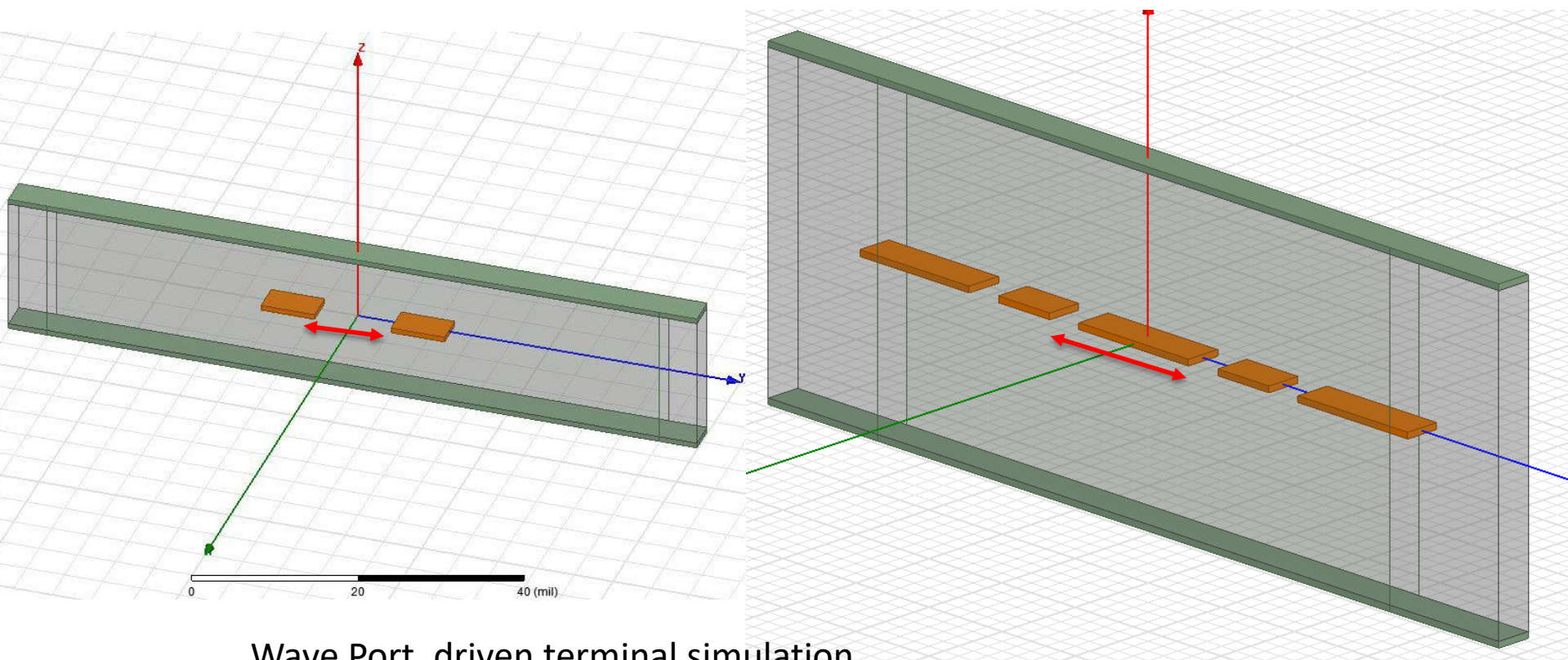
# CPW Losses



# Stripline Losses



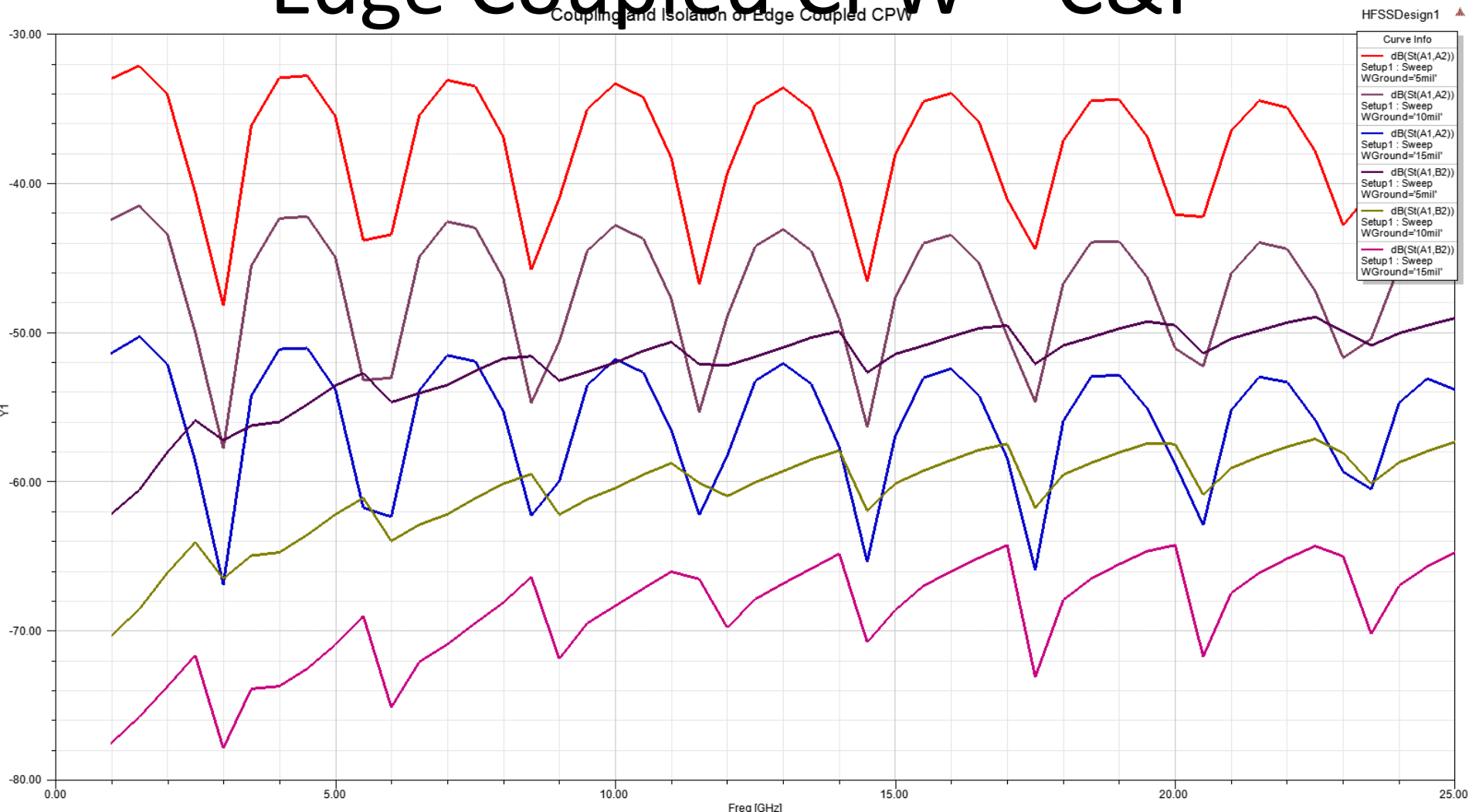
# Edge Coupled Stripline and CPW



Wave Port, driven terminal simulation

# Edge Coupled CPW – C&I

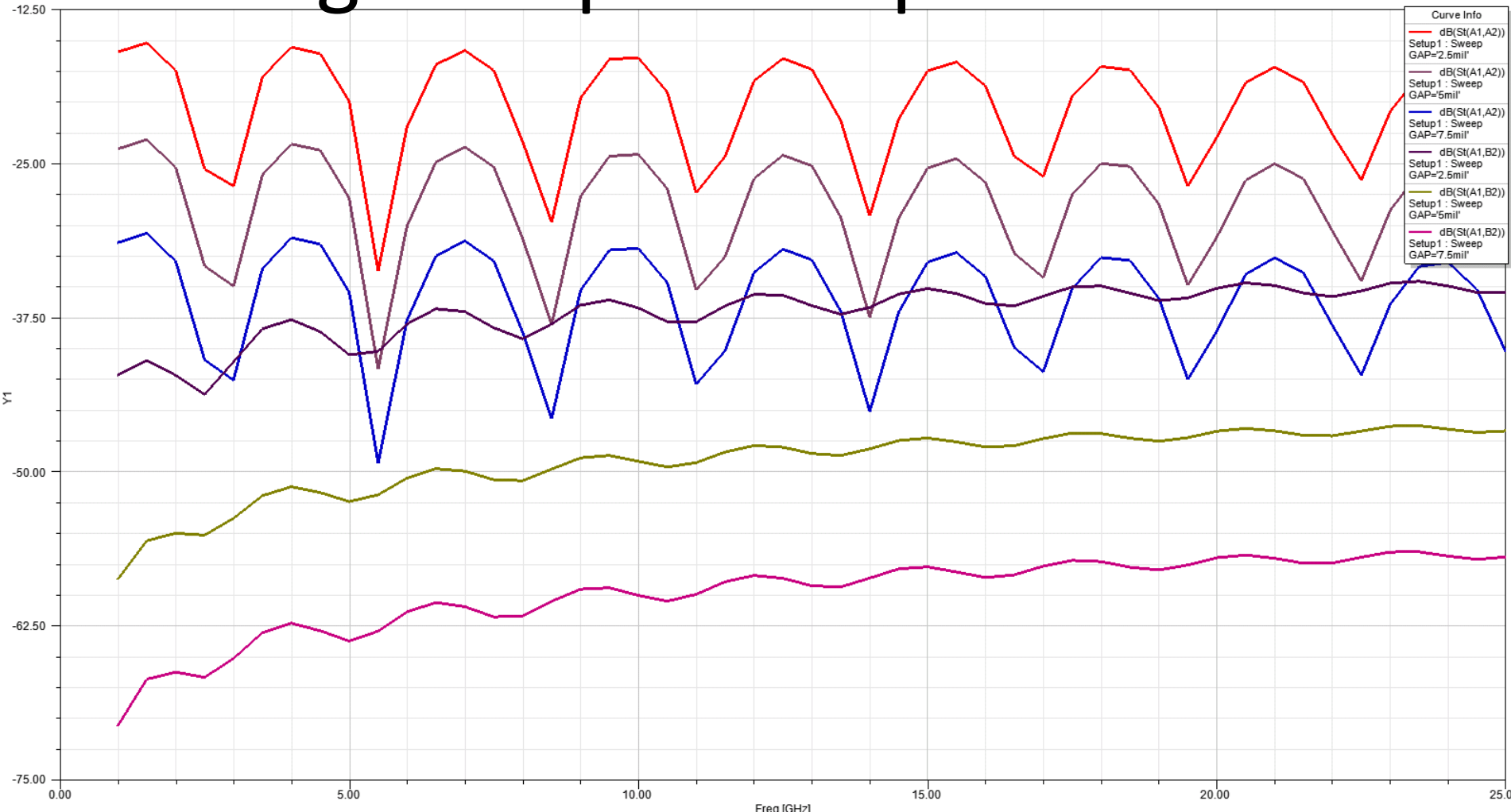
Coupling and Isolation of Edge Coupled CPW



# Edge Coupled Stripline – C&I

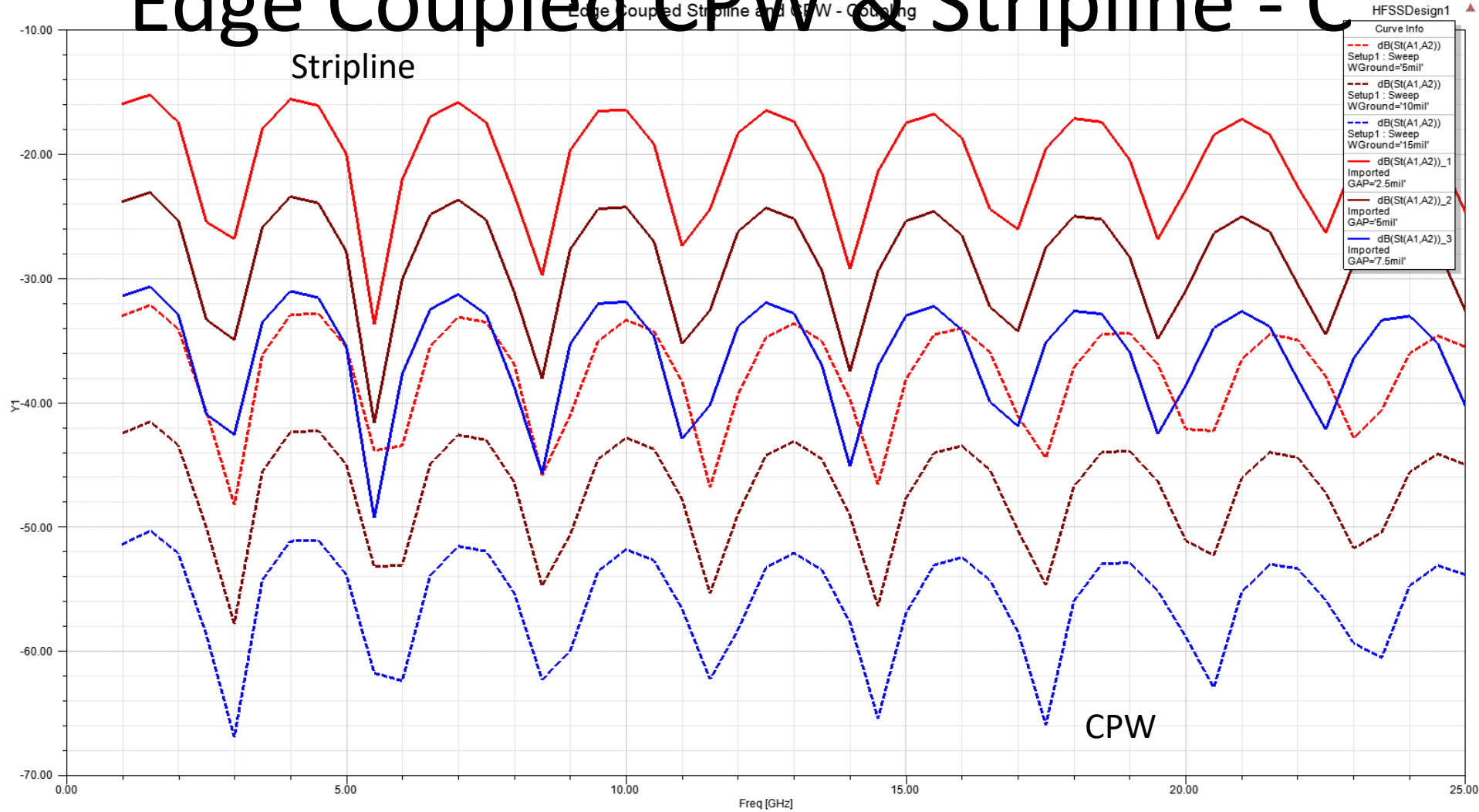
Edge Coupled Stripline – C&I

HFSSDesign1



# Edge Coupled CPW & Stripline - C

Edge Coupled Stripline and CPW - Coupling



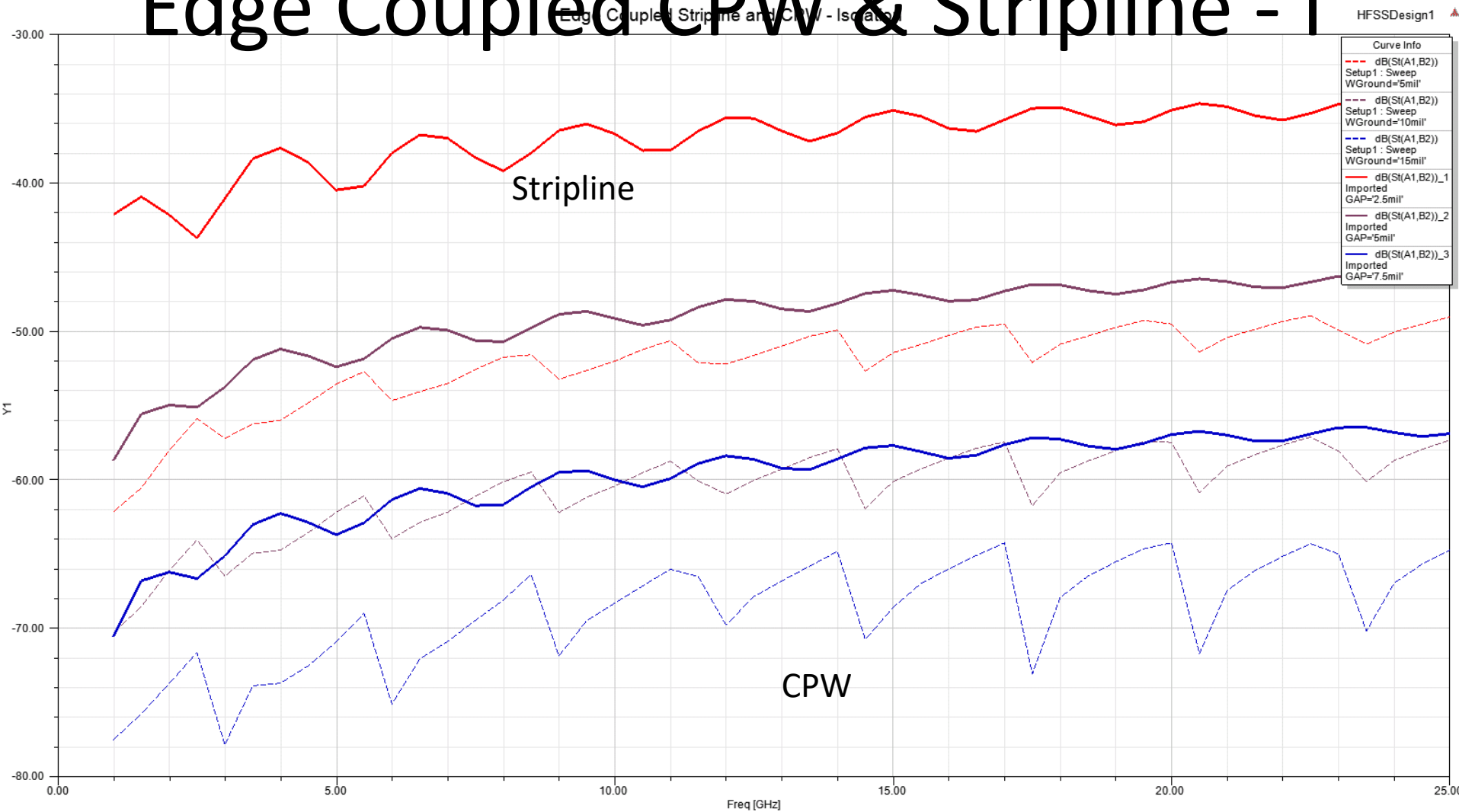


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# Edge Coupled CPW & Stripline - I





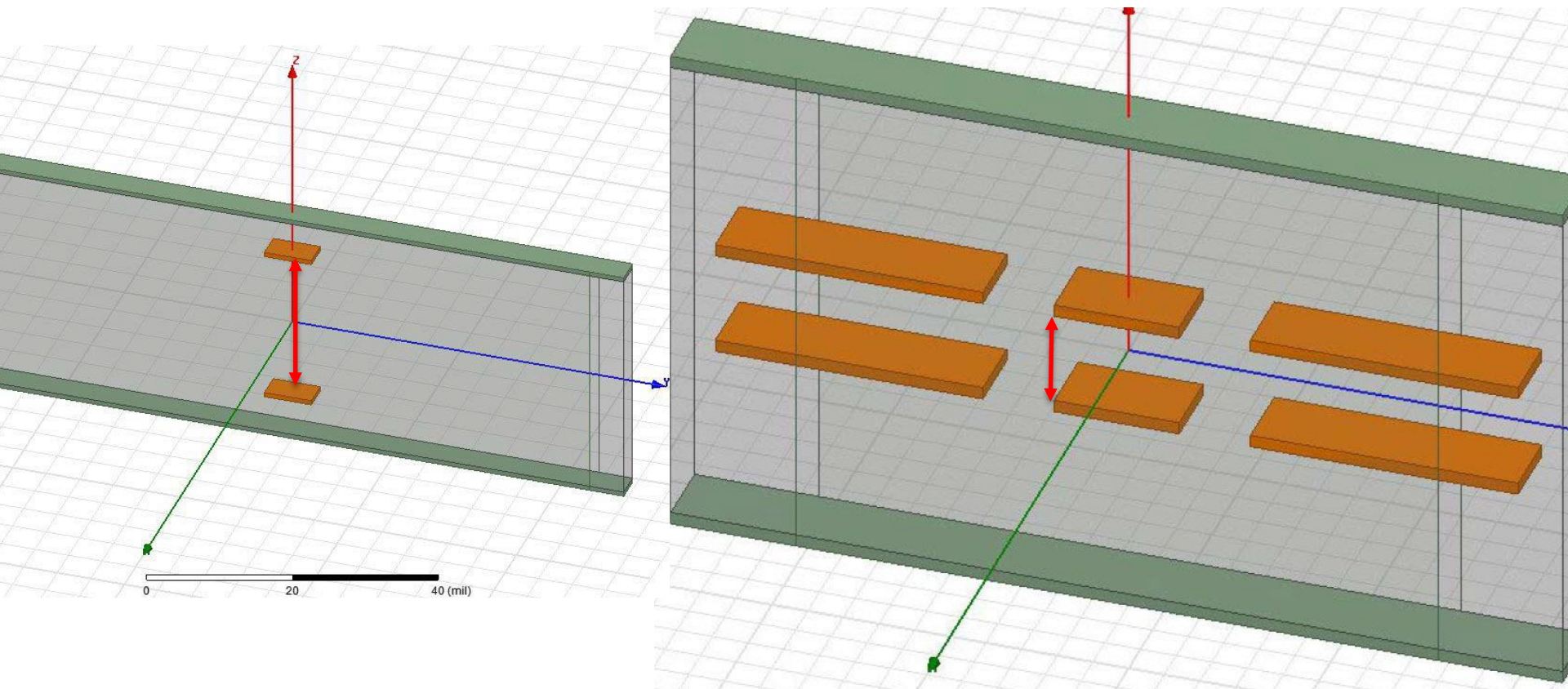
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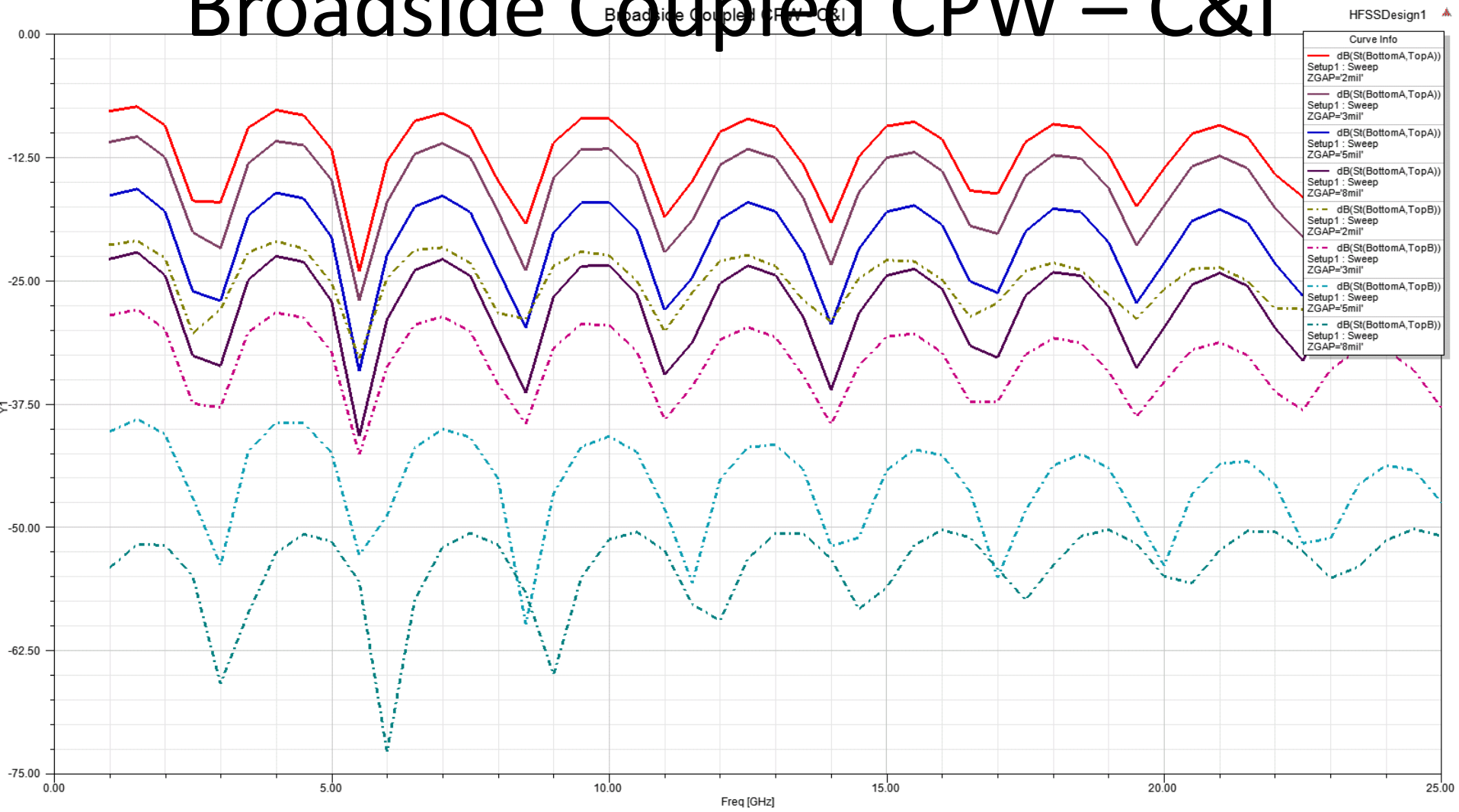
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# Broadside coupled Stripline and CPW



# Broadside Coupled CPW – C&I





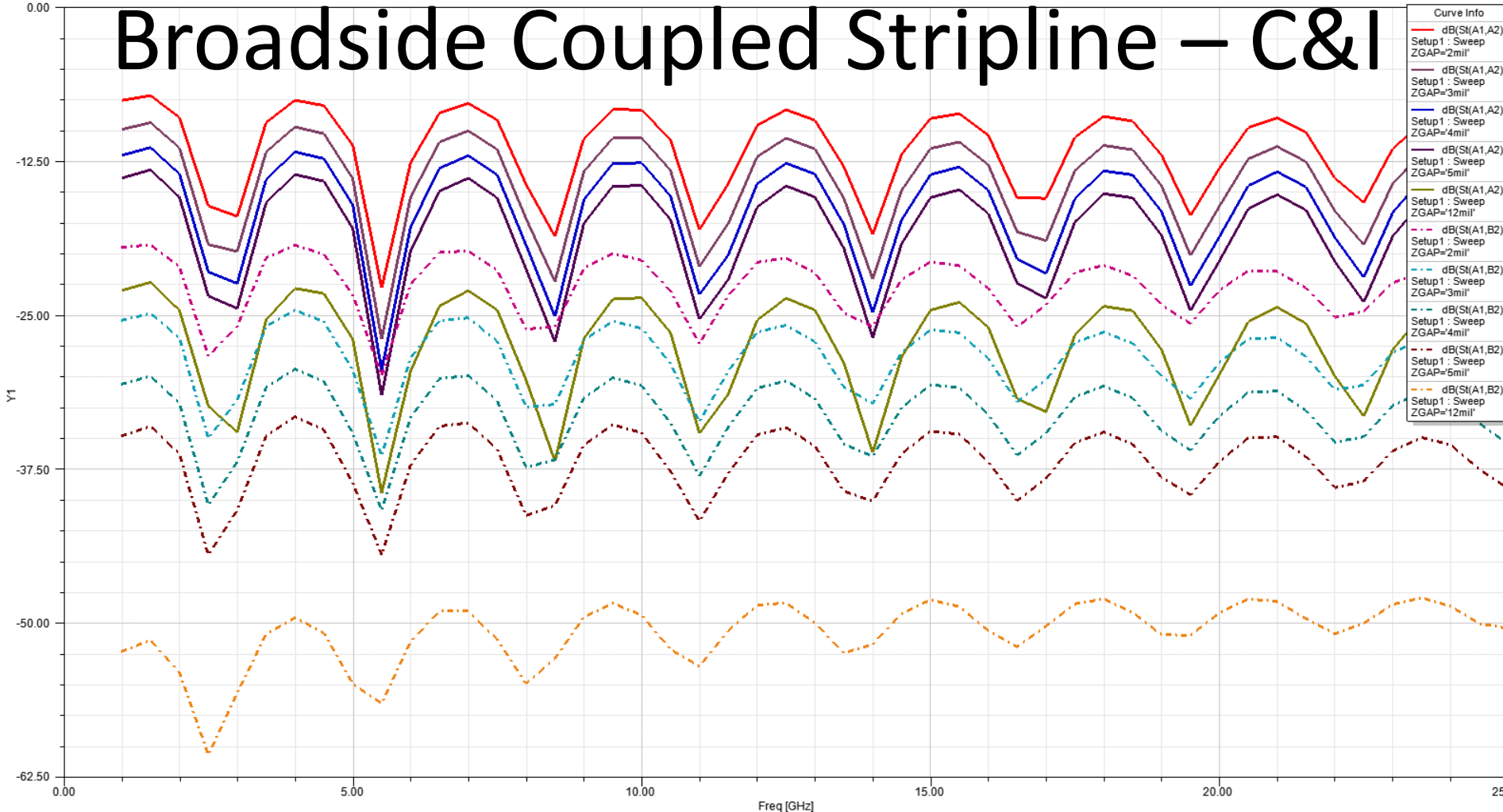
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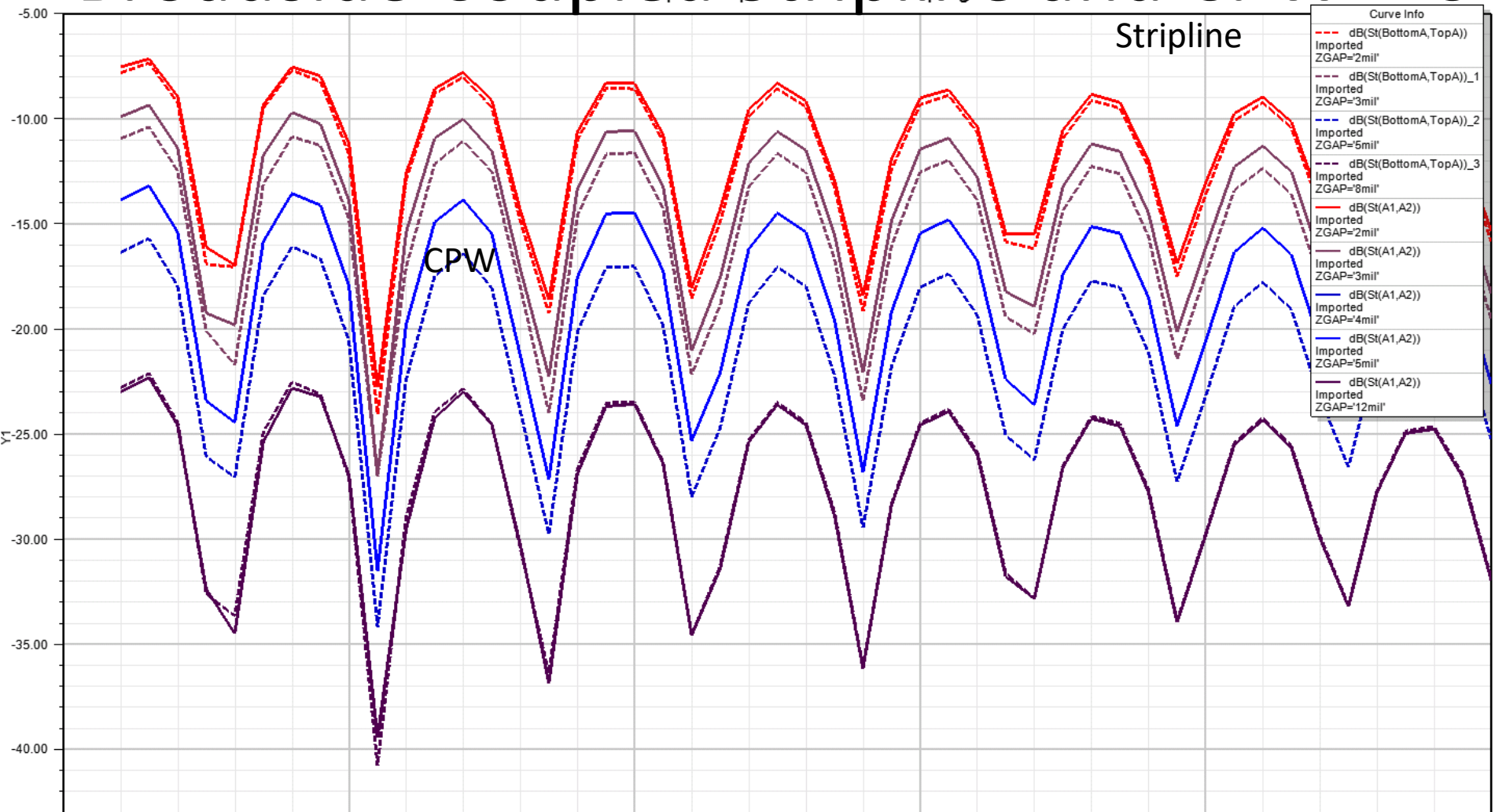
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Broadside Coupled Stripline - Coupling and Isolation

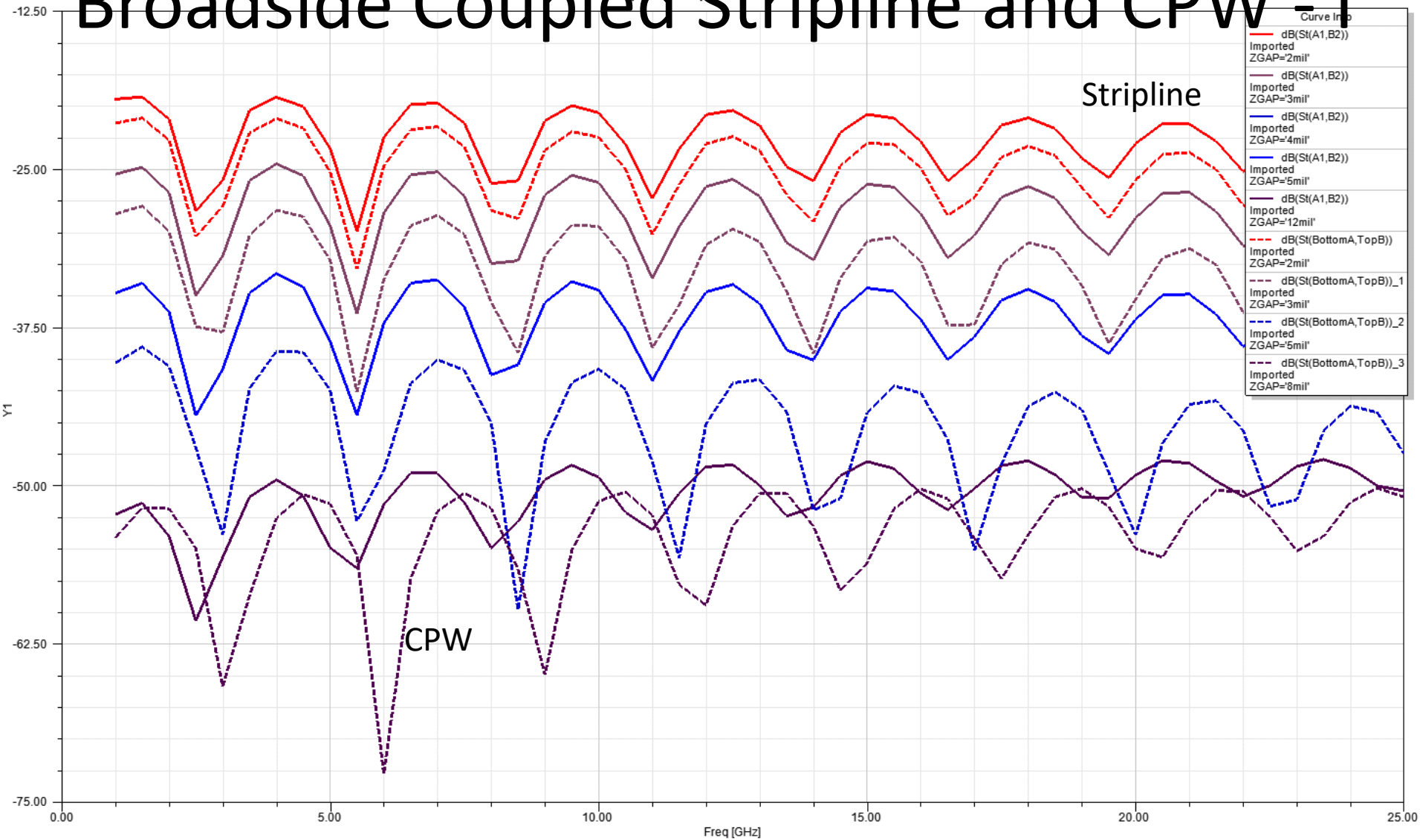
# Broadside Coupled Stripline – C&I



# Broadside Coupled Stripline and CPW – C



# Broadside Coupled Stripline and CPW - 1



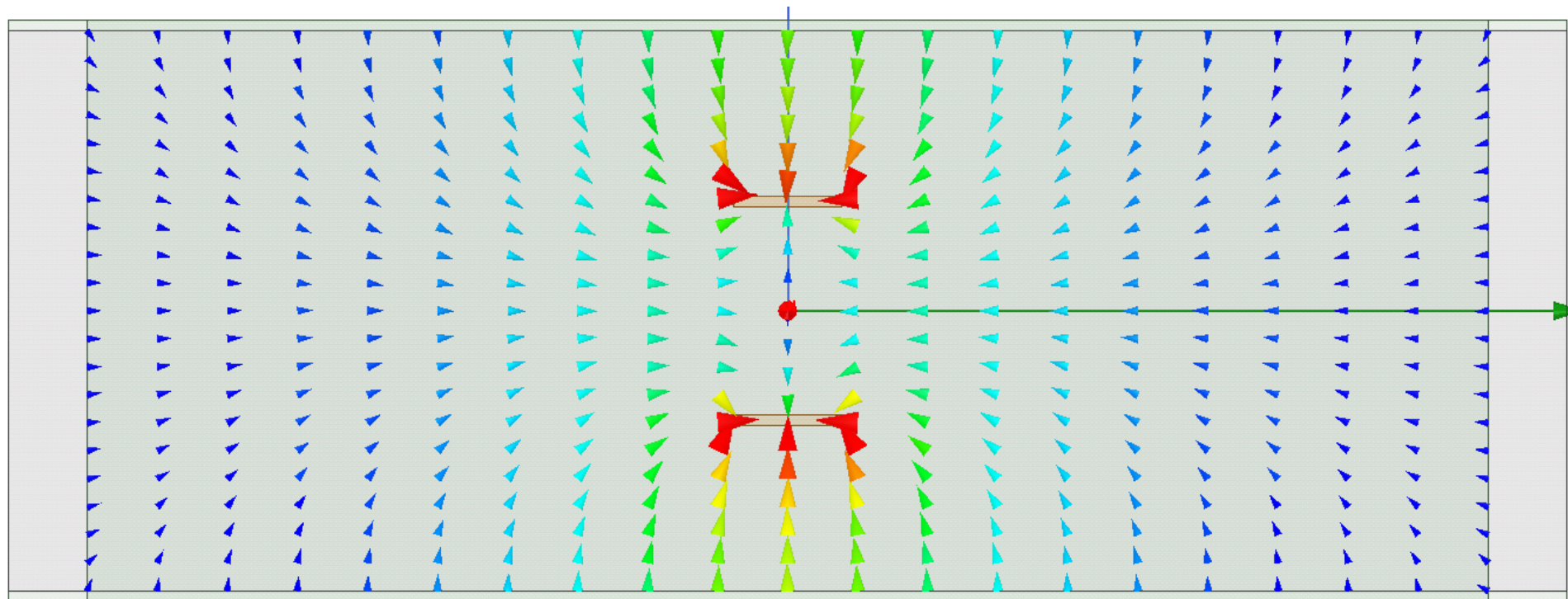
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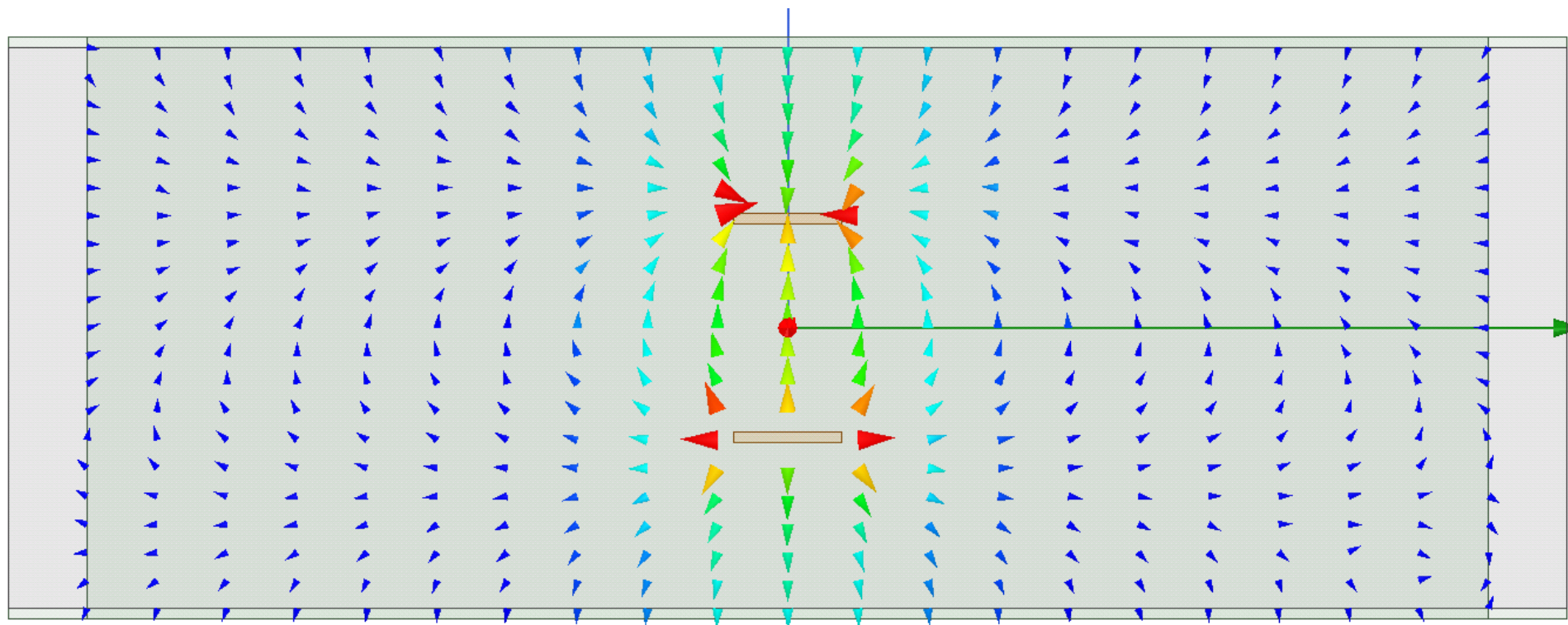
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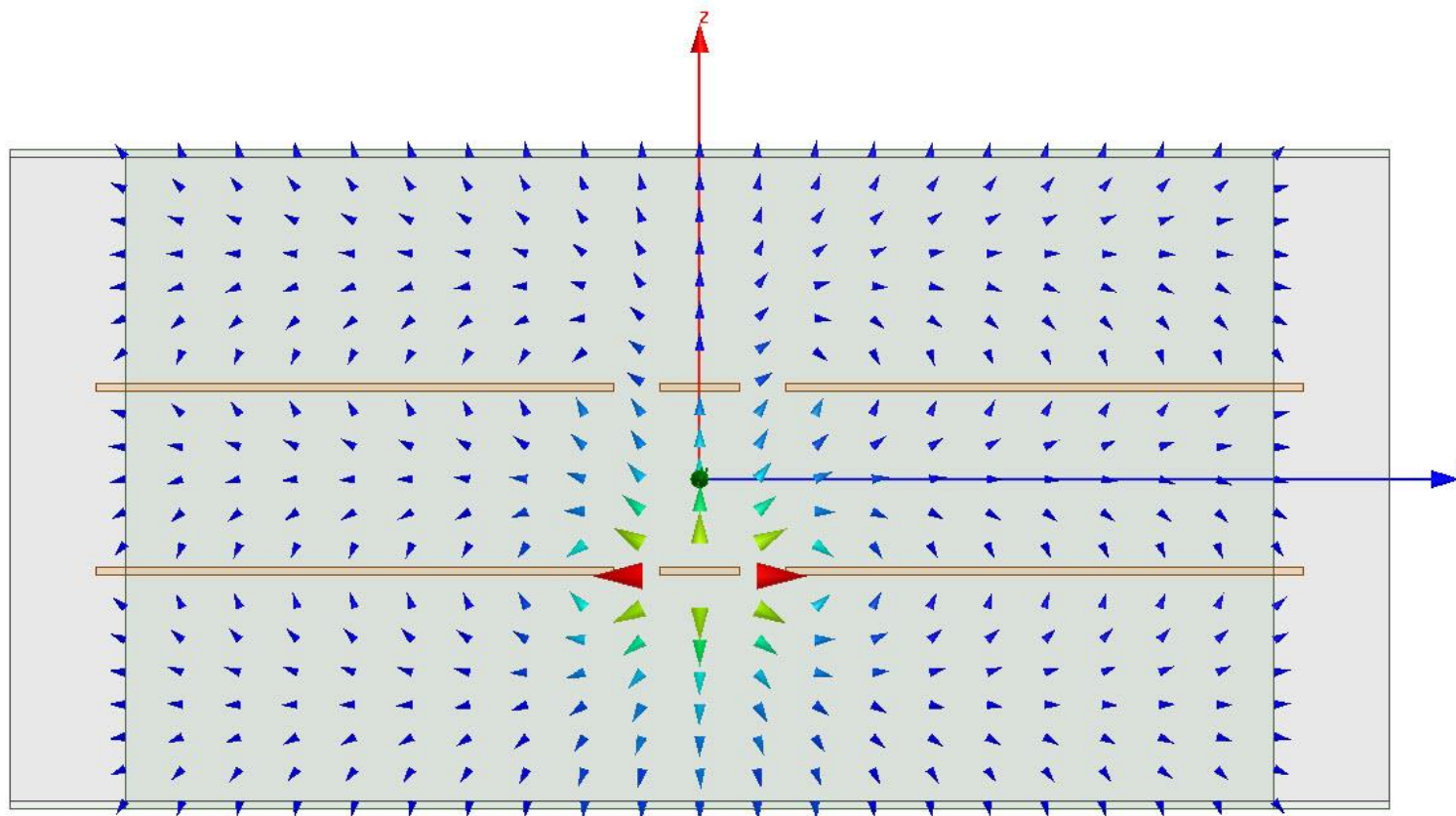
# Broadside Coupled Stripline Even Mode



# Broadside Coupled Stripline Odd Mode

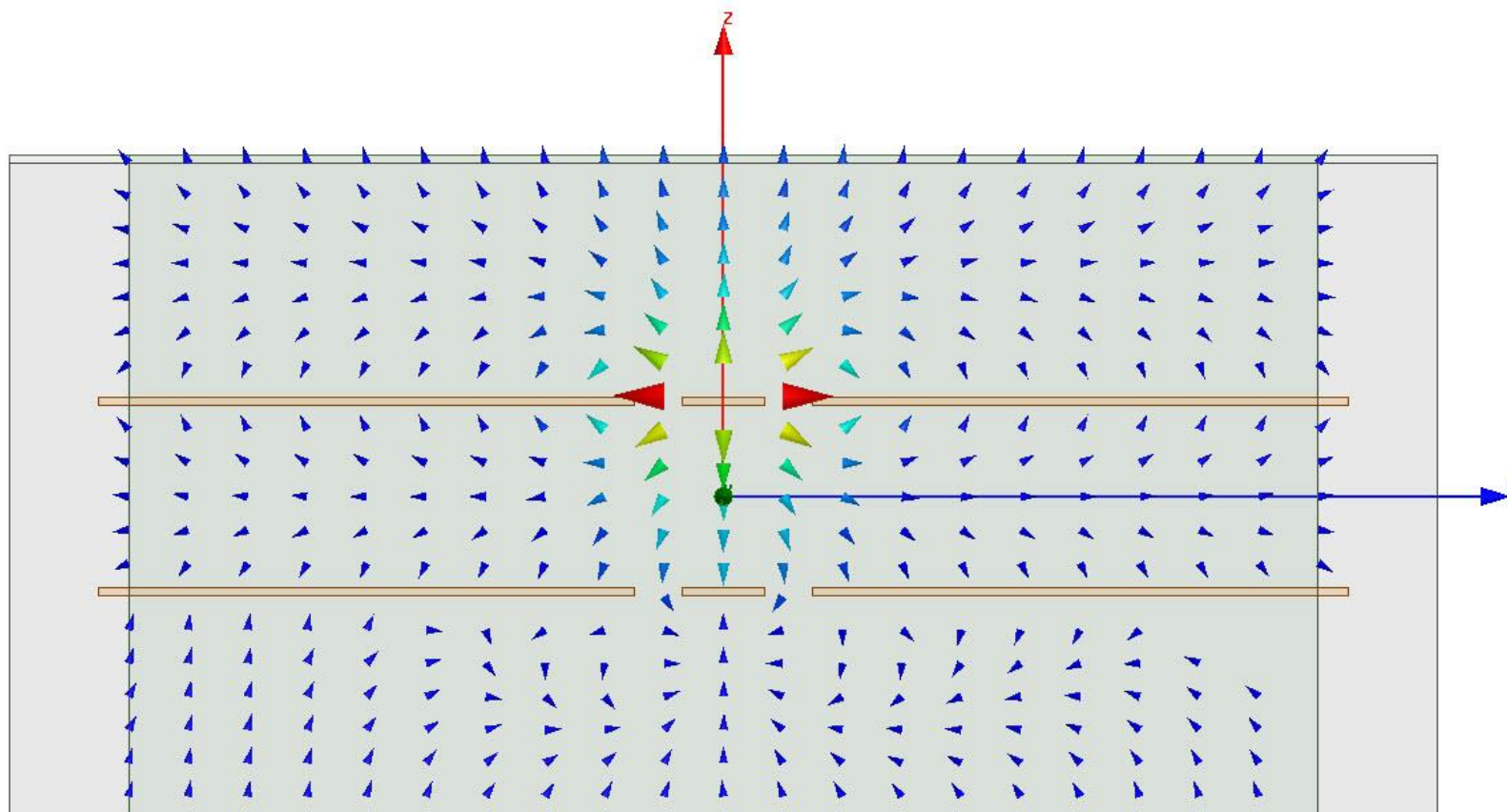


# Broadside Coupled CPW mode 1

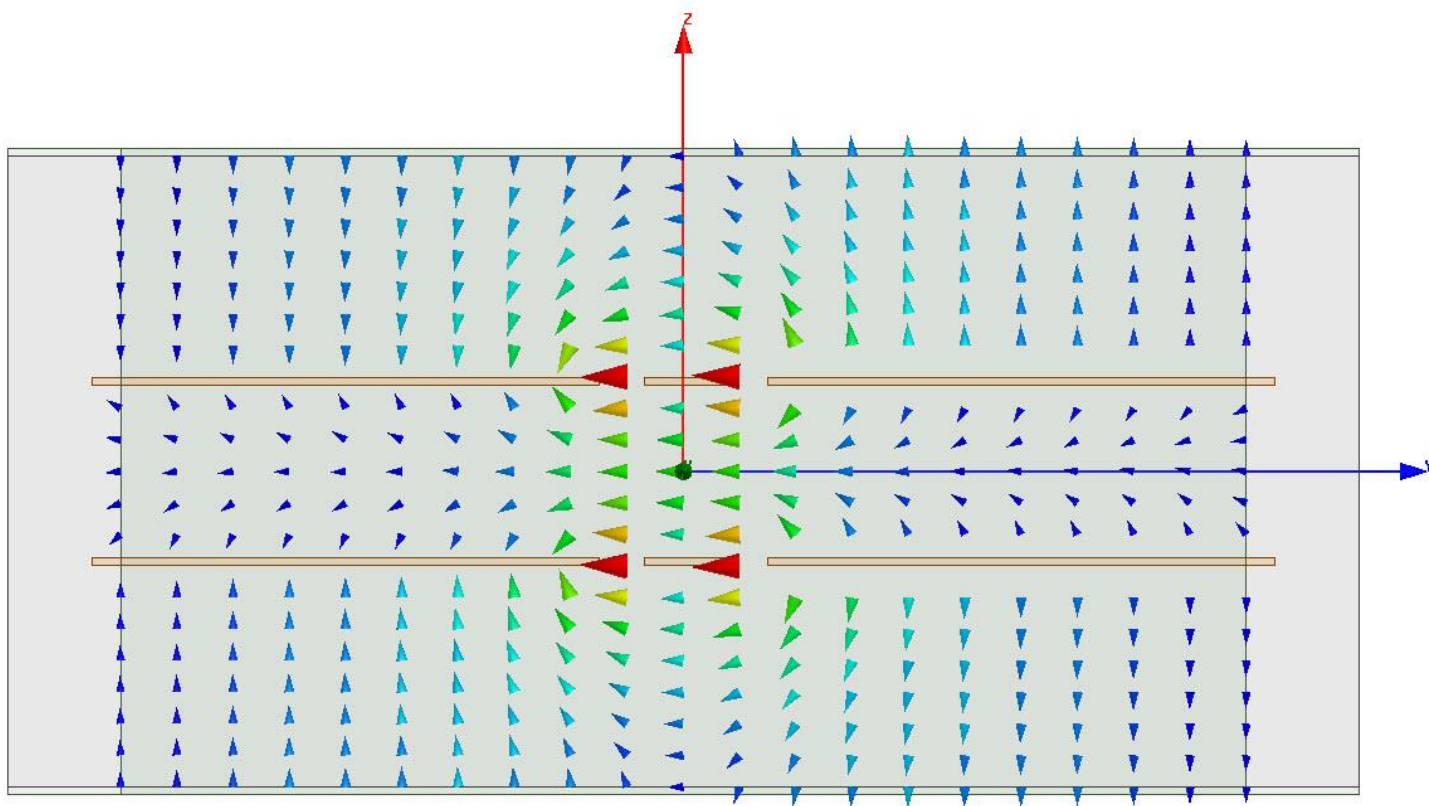




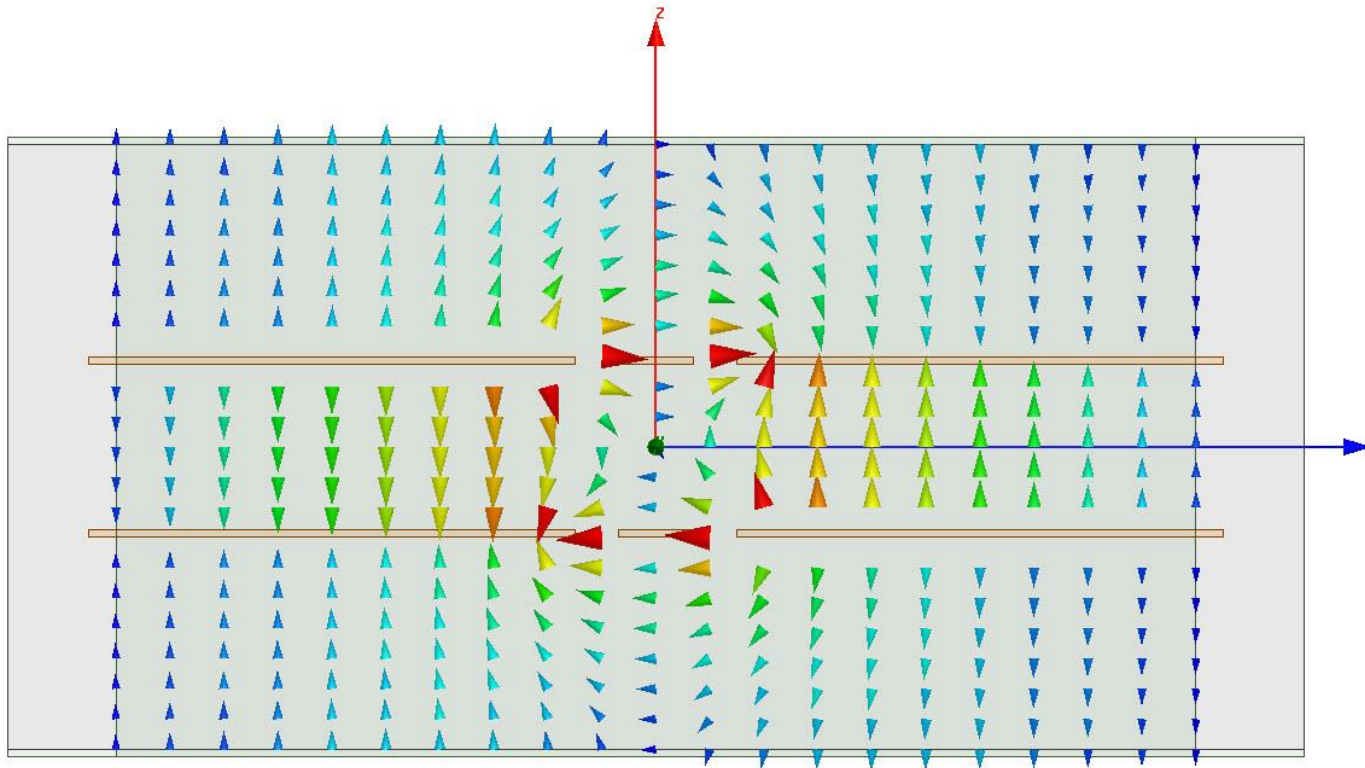
# Broadside Coupled CPW Even Mode



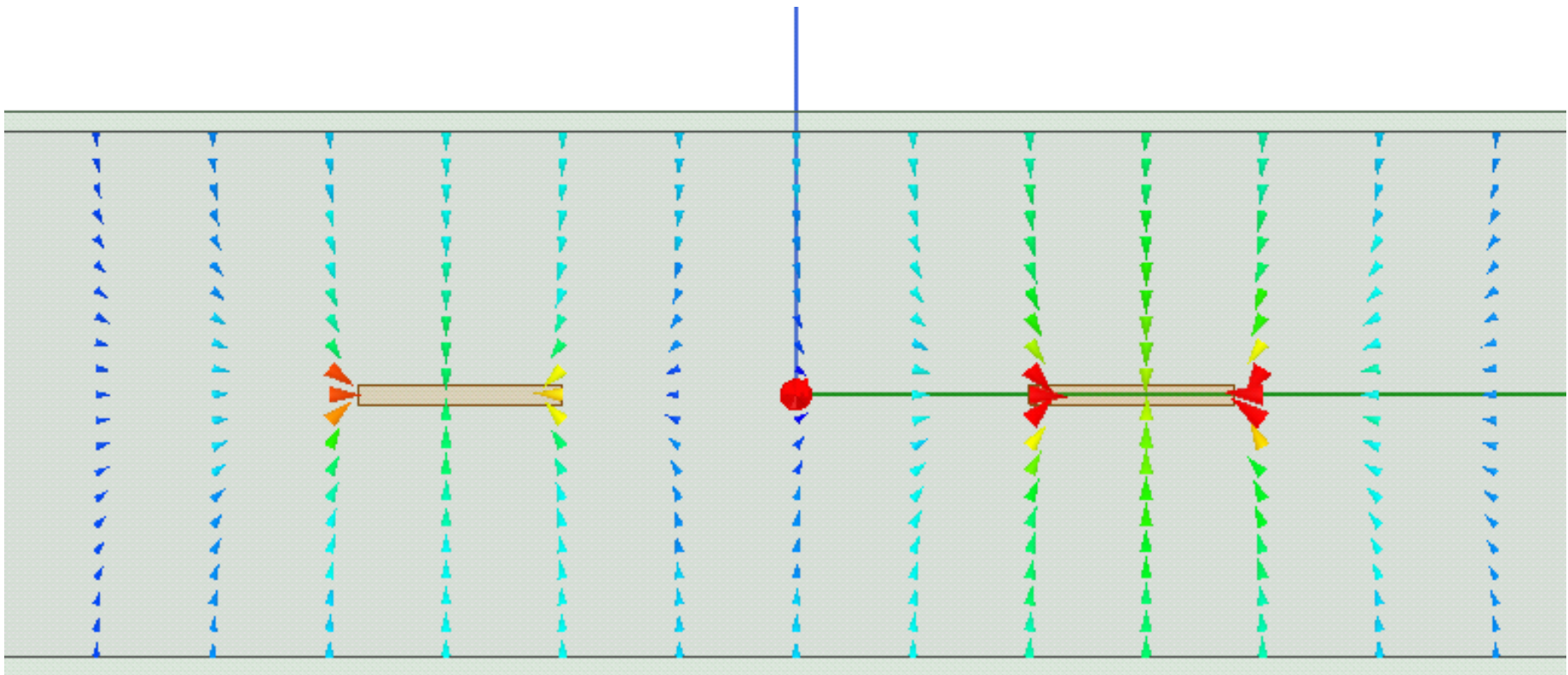
# Broadside Coupled CPW Even Slot Mode



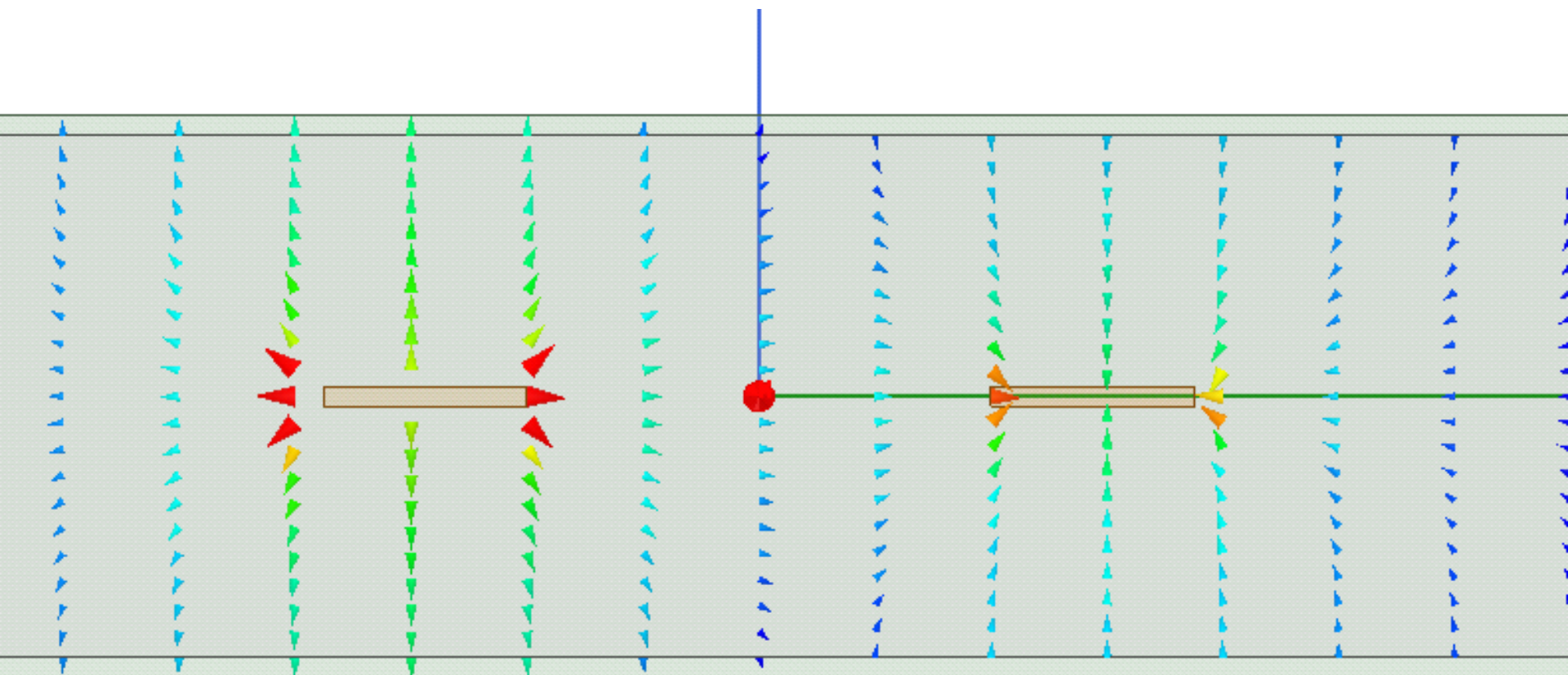
# Broadside Coupled CPW Odd Slot Mode



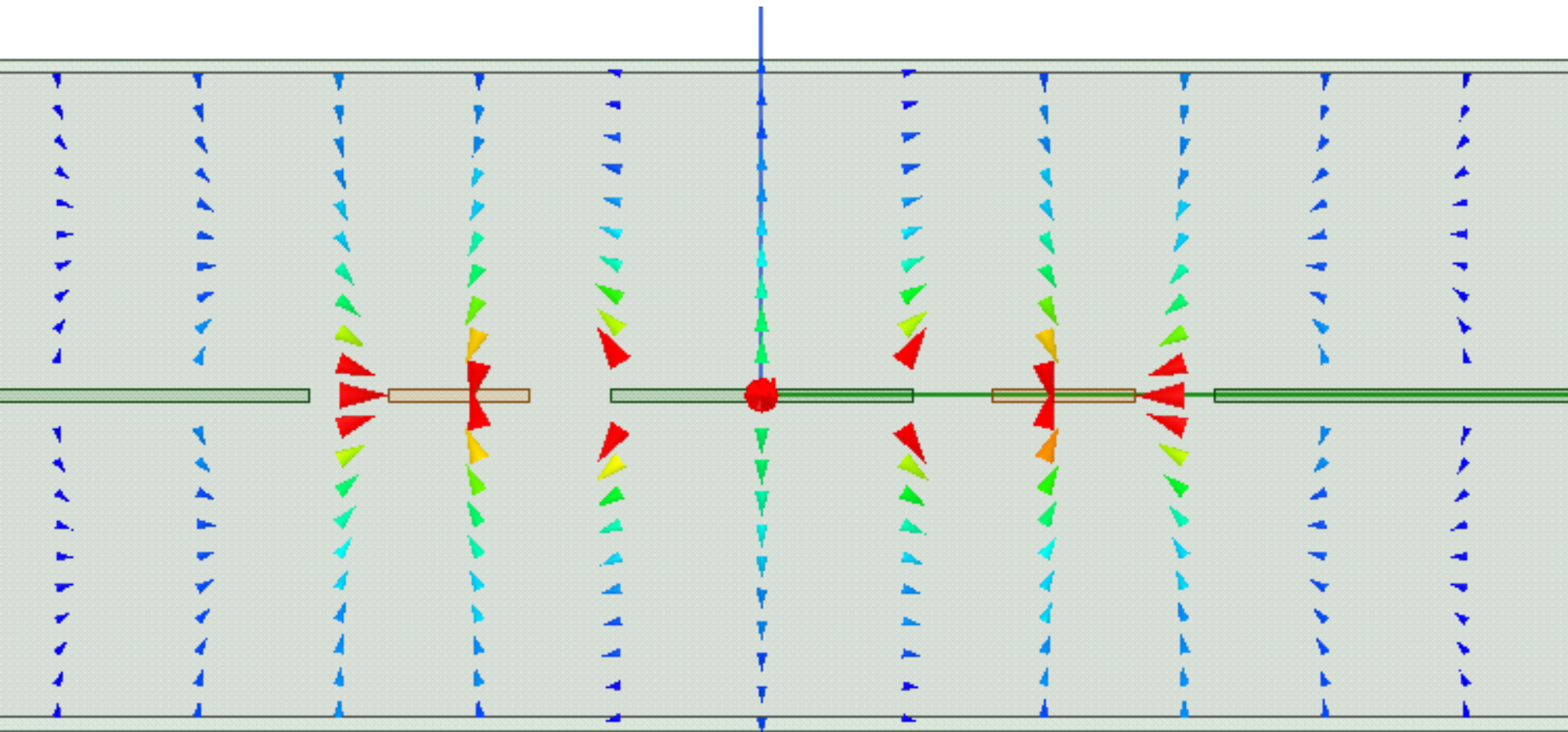
# Edge Coupled Stipline Even Mode



# Edge Coupled Stripline Odd Mode



# Edge Coupled CPW Mode



# Edge Coupled CPW Slotline mode

