

# Top Plate Design Variation Effect Upon S11 And The Tilt Angle Of The Gain Max along $\Phi = 0$ .

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I varied the size and style of the top plate capacitor using two different designs (Figs. 1 and 2). The S11 response of the standard design was superior in every case (Figs. 3 and 4). The symmetrical top plate capacitor did not have a better tilt angle response (Fig. 5) as reported in the telecom last week- the design with the skinny 1" stub width was the one with the better response. The confusion on this issue was due to a CST crash last week which made it confusing to tell which data belonged to which simulation. The issue of CST crashing has been resolved.

Figures 3 and 4 show the S11 response of the S11 response for the symmetrical rectangular capacitor for two lengths and a response for the reference design which is the design implemented in our current antenna. Figure 5 shows the tilt angle response.

I will continue to search for a skinny stub design which matches or betters our current design, but for the upcoming deployment, I would recommend that our current top plate capacitor design be our top plate capacitor of record.

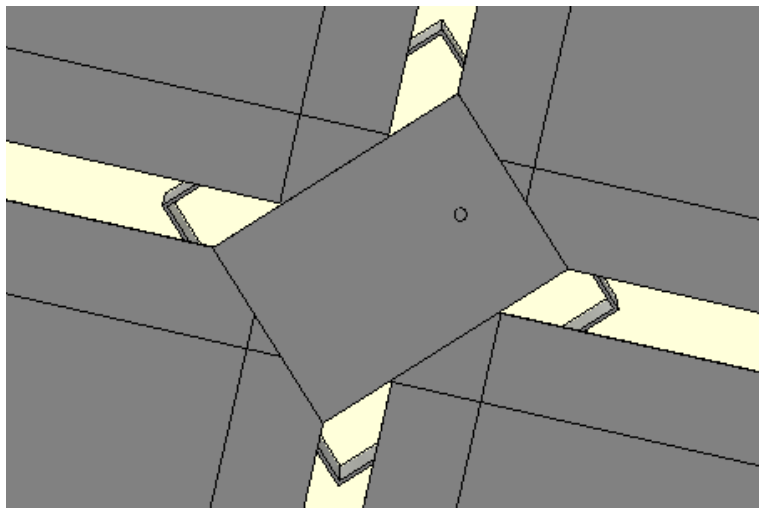


Figure 1. Symmetrical Rectangular top plate capacitor

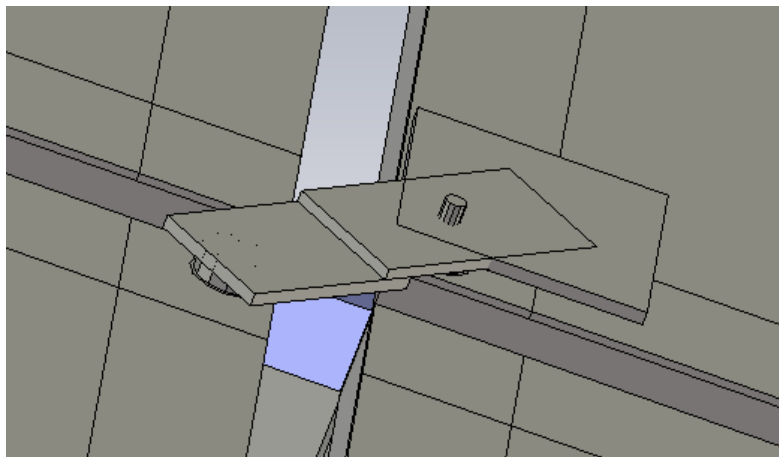


Figure 2. Skinny stub top plate capacitor.

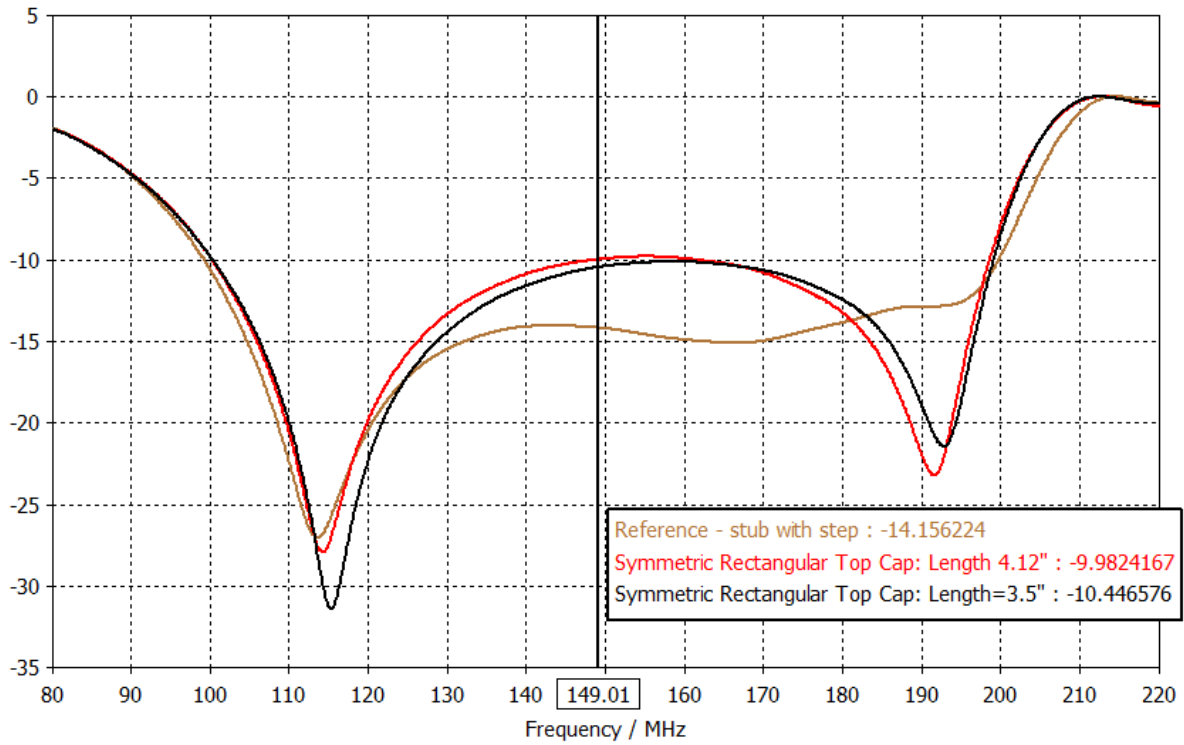


Figure 3. S11 response of the symmetrical rectangular top plate designs

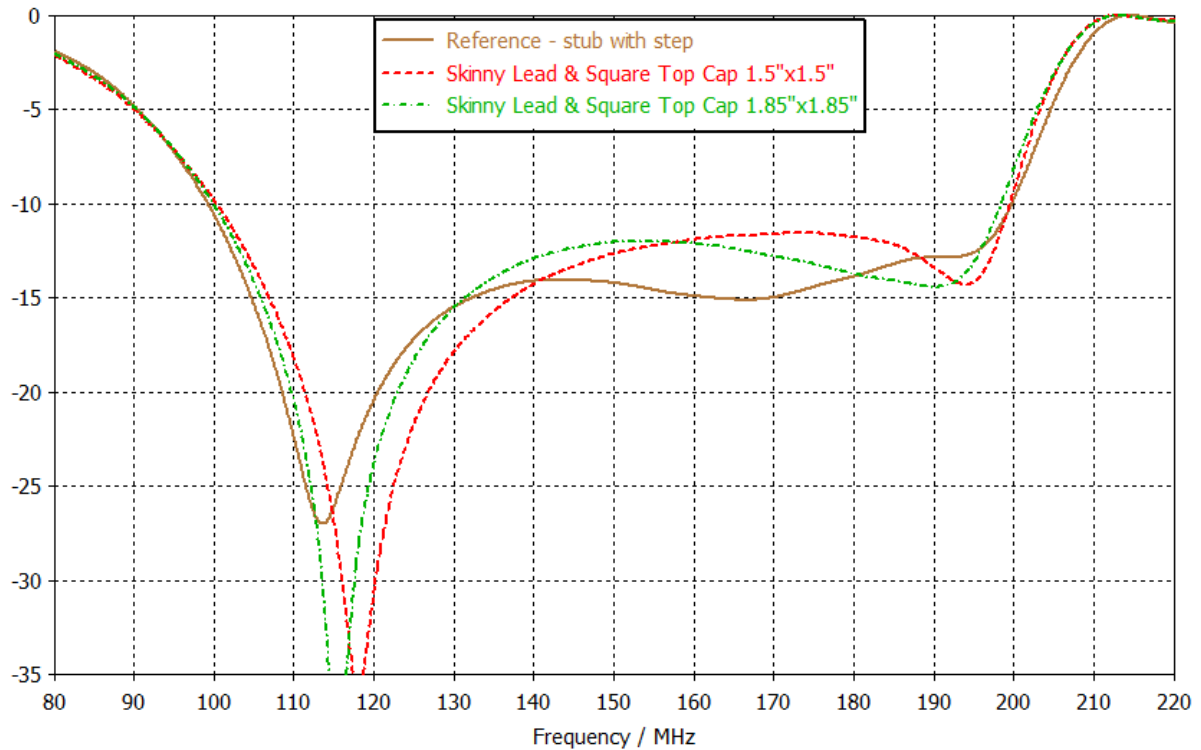


Figure 4. S11 response of the skinny stub top plate designs with two sizes of the square capacitor piece.

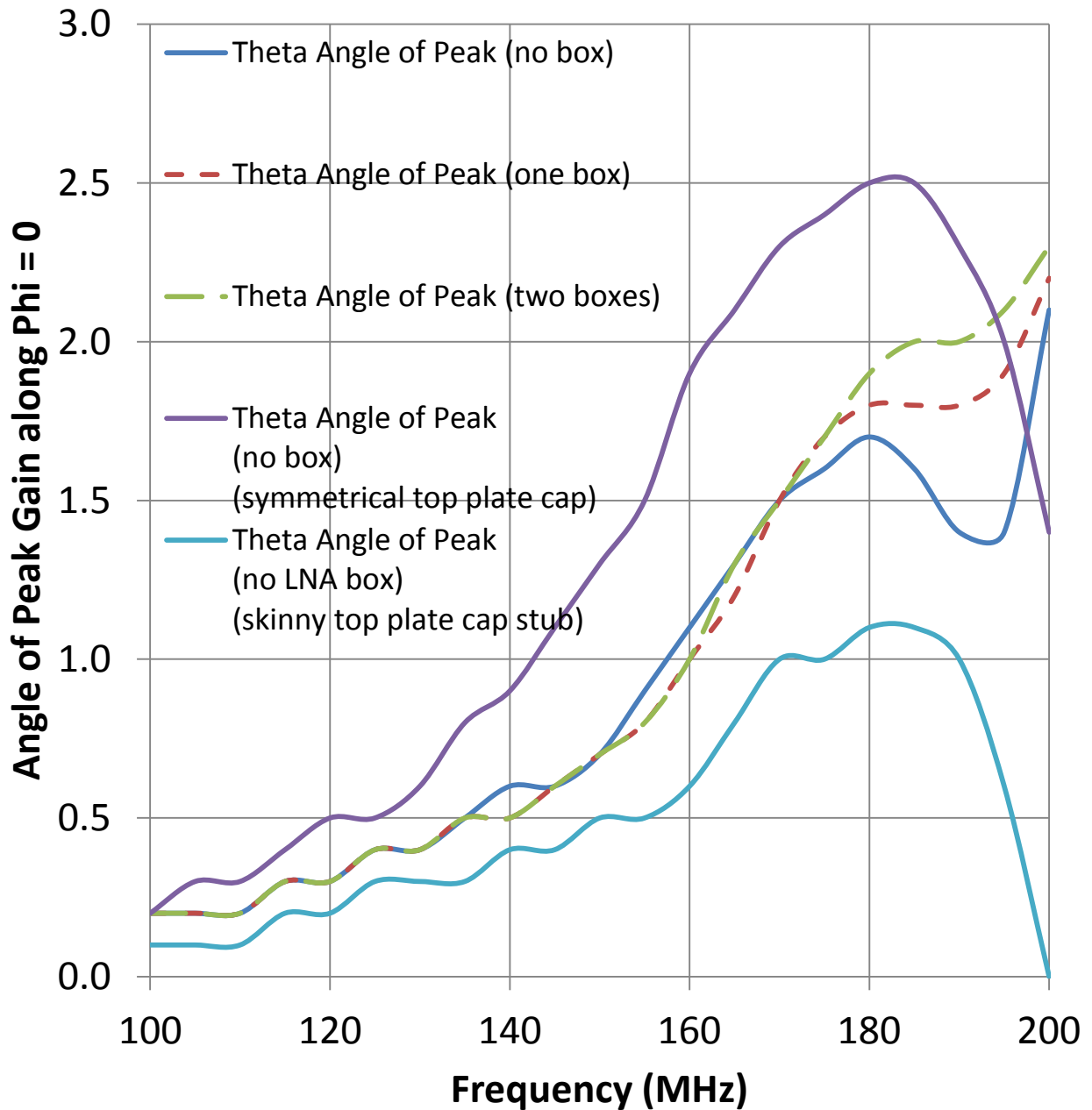


Figure 5.

Tilt angle of the beam max along  $\phi=0$  for 5 cases: 3 with the standard top plate design as implemented now: 1) No LNA Boxes, 2) One LNA Box, 3) Two LNA boxes, 4) Rectangular top plate design, and 5) skinny stub design. The skinny stub design has the lowest tilt angle.