LOW LOSS 90 OPTICAL HYBRID

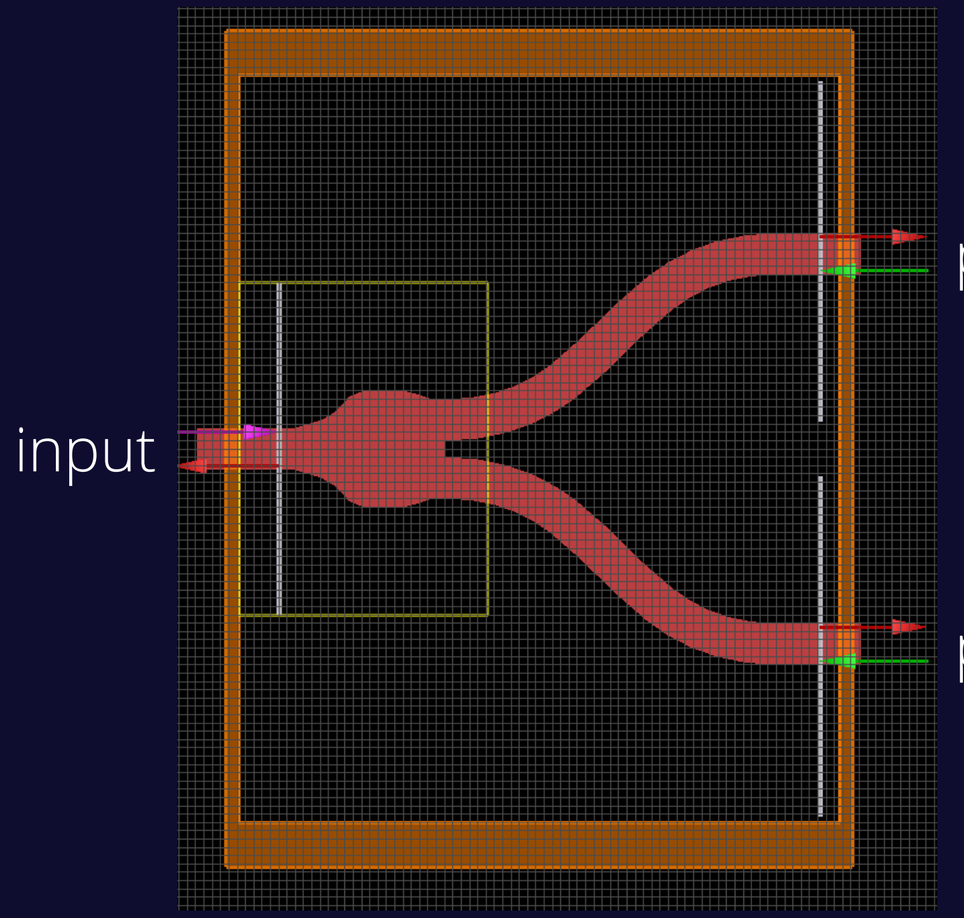
COMPONENTS:

Y - branch

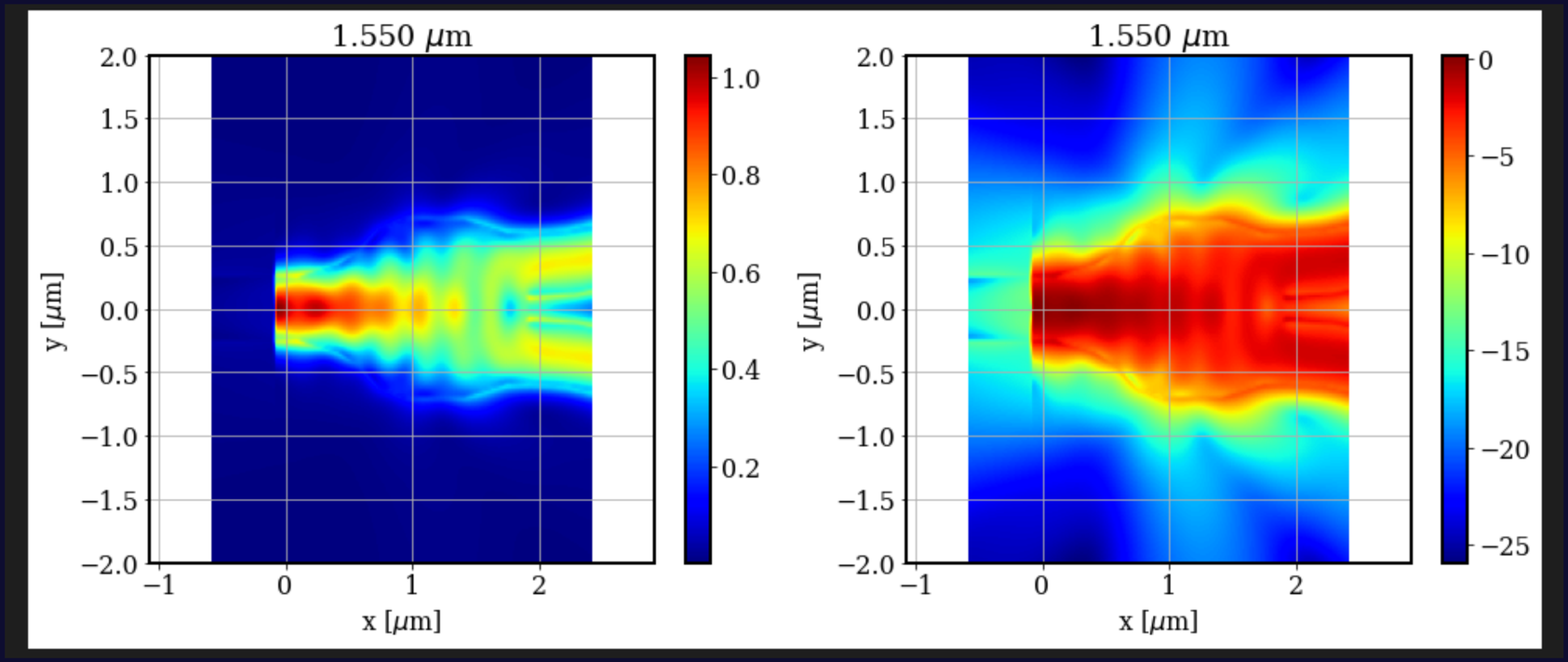
Reference:

Y. Zhang, S. Yang, A. E.-J. Lim, G.-Q. Lo, C. Galland, T. Baehr-Jones, and M. Hochberg, “A compact and low
loss Y-junction for submicron silicon waveguide,” Opt. Express 21(1), 1310–1316 (2013).

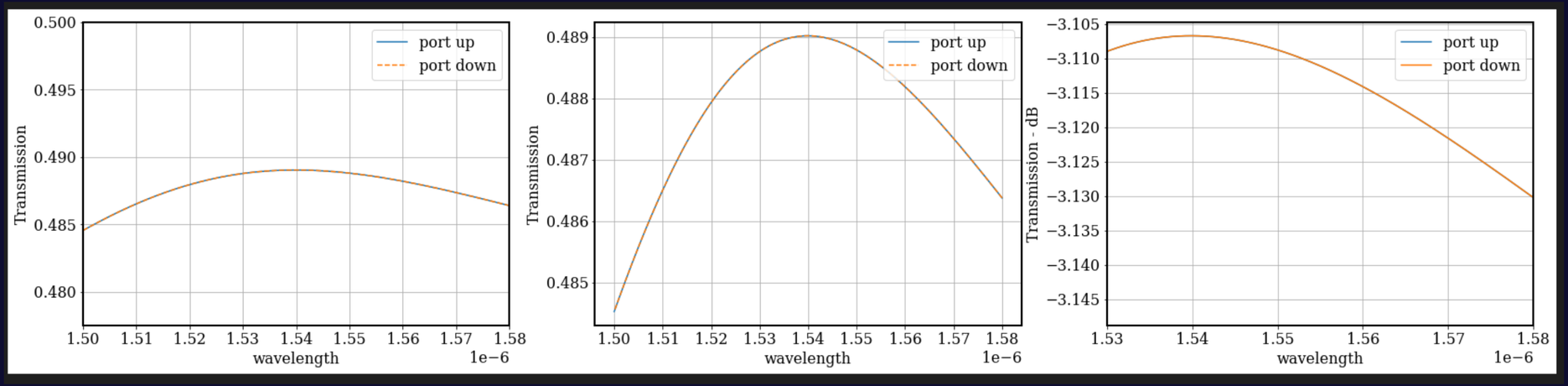
DESIGN - FDTD

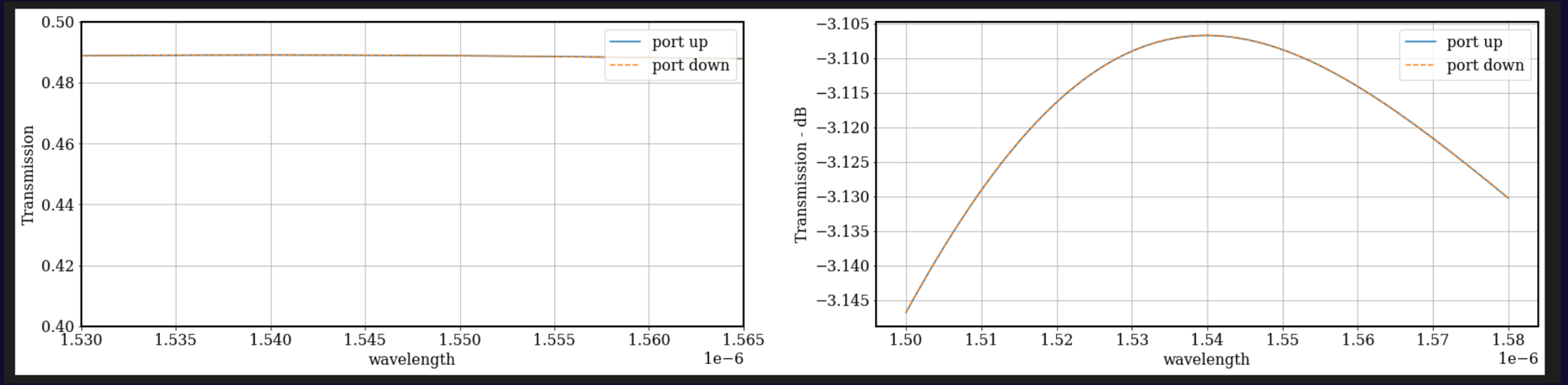


SIMULATION RESULTS - FDTD

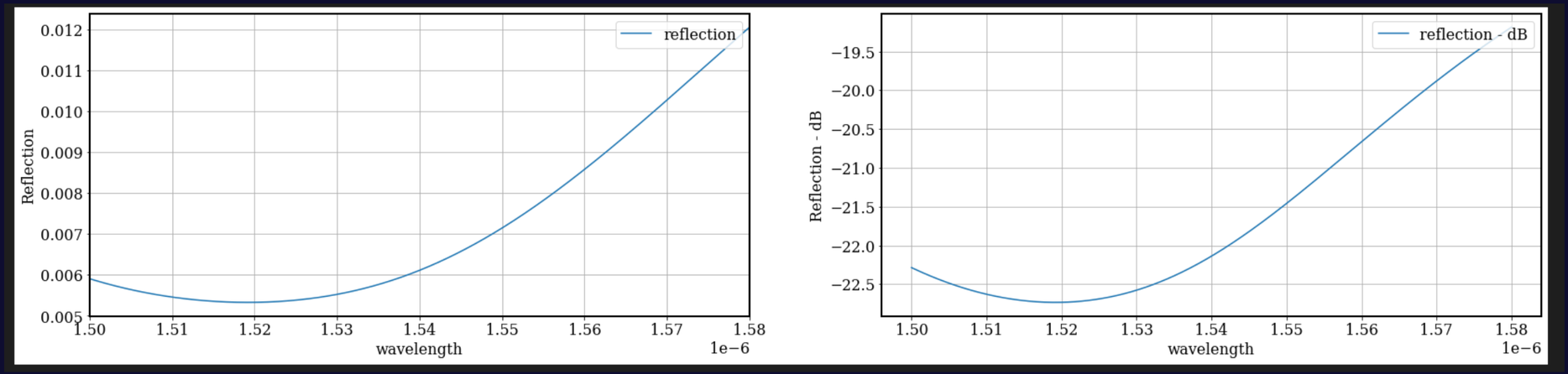


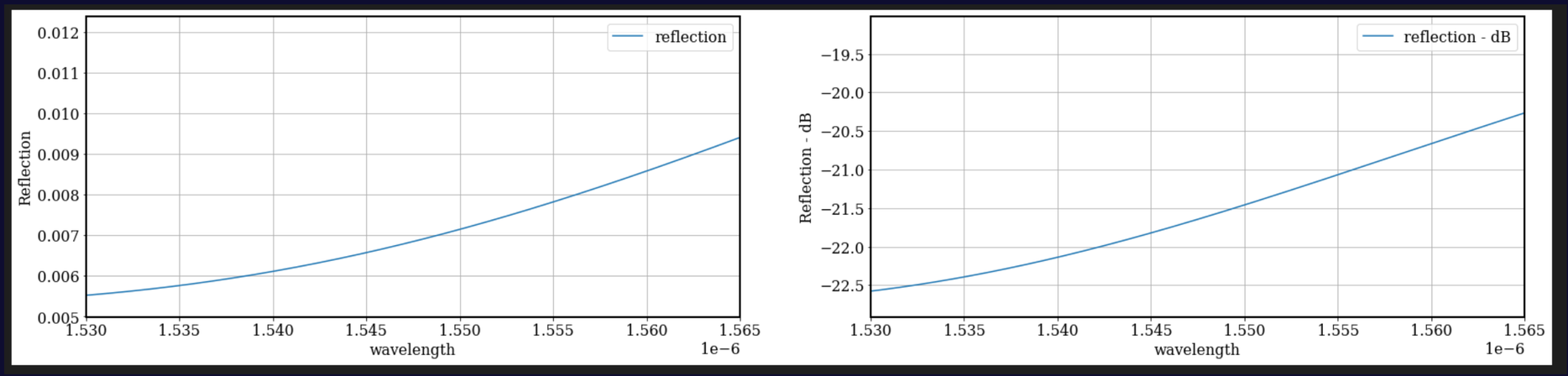
TRANSMISSION



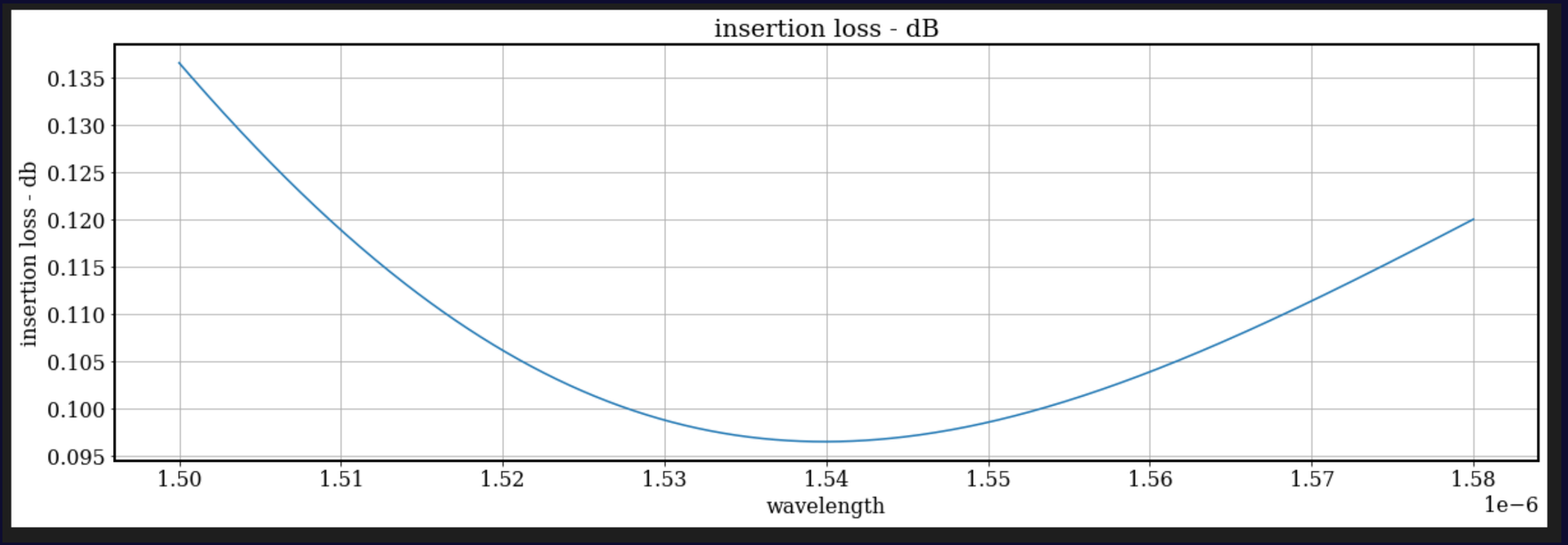


REFLECTION


reflection
Reflection
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
1.50
1.51
1.52
1.53
1.54
1.55
1.56
1.57
1.58
wavelength
1e−6
reflection - dB
Reflection - dB
−19.5
−20.0
−20.5
−21.0
−21.5
−22.0
−22.5
1.50
1.51
1.52
1.53
1.54
1.55
1.56
1.57
1.58
wavelength
1e−6


reflection
Reflection
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength
1e−6
reflection - dB
Reflection - dB
−19.5
−20.0
−20.5
−21.0
−21.5
−22.0
−22.5
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength
1e−6

INSERTION LOSS

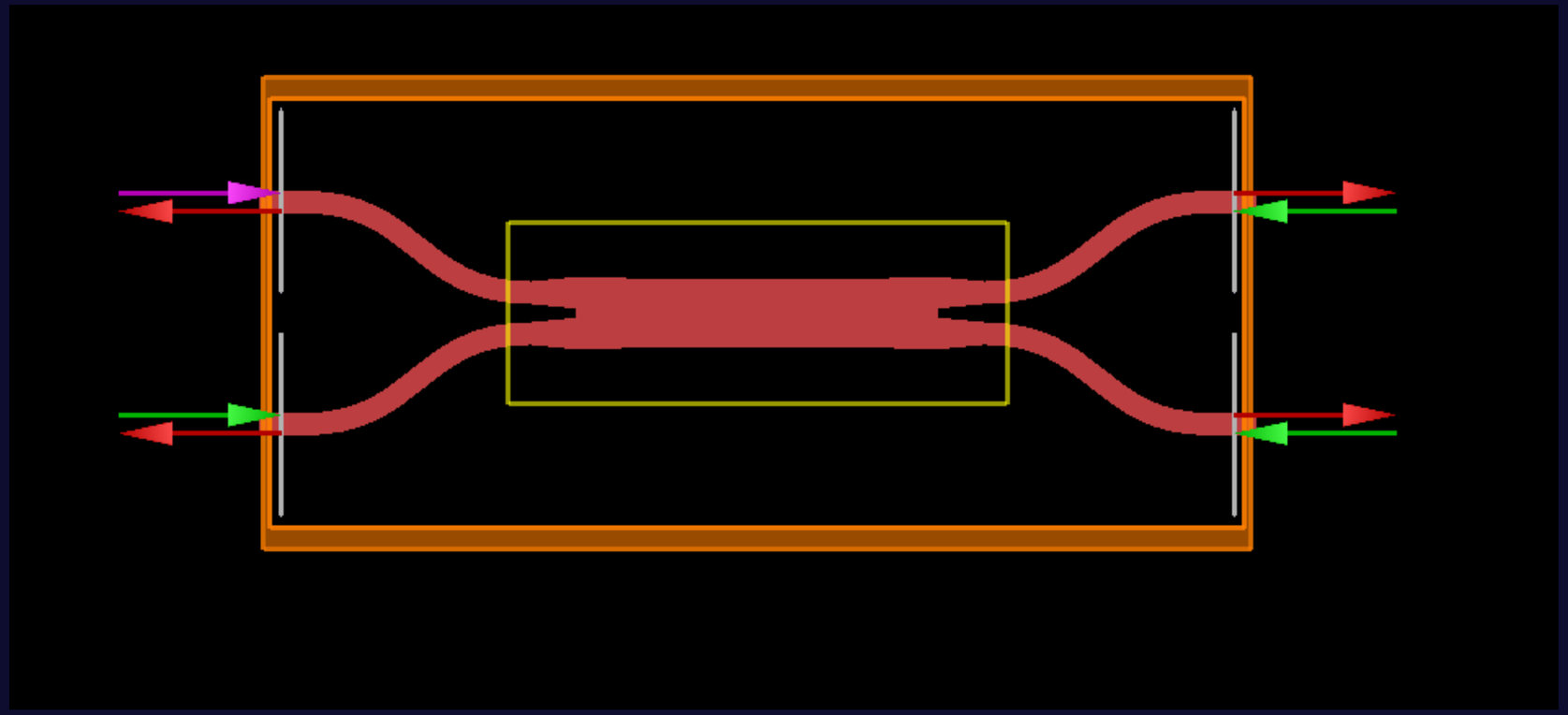


MMI 2 X 4

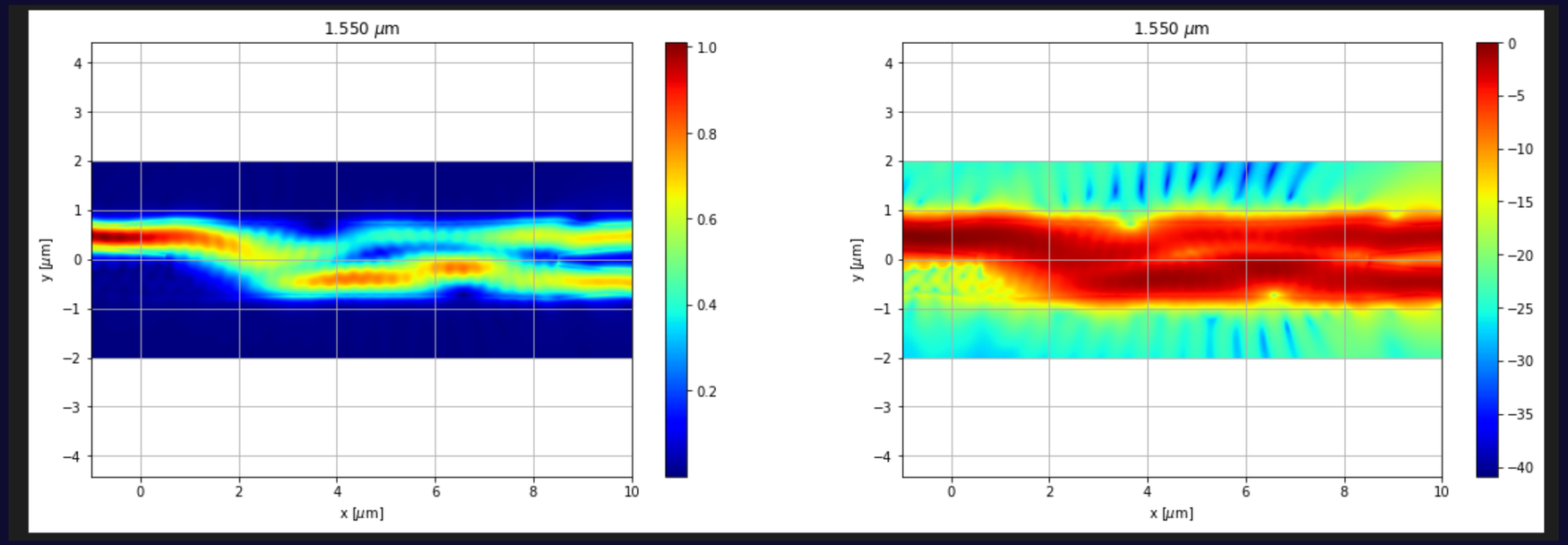
Reference:

Hang Guan, Yangjin Ma, Ruizhi Shi, Xiaoliang Zhu, Rick Younce, Yaojia Chen, Jose Roman, Noam Ophir, Yang Liu, Ran Ding, Thomas Baehr-Jones, Keren Bergman, and Michael Hochberg, "Compact and low loss 90° optical hybrid on a silicon-on-insulator platform," Opt. Express 25, 28957-28968 (2017)

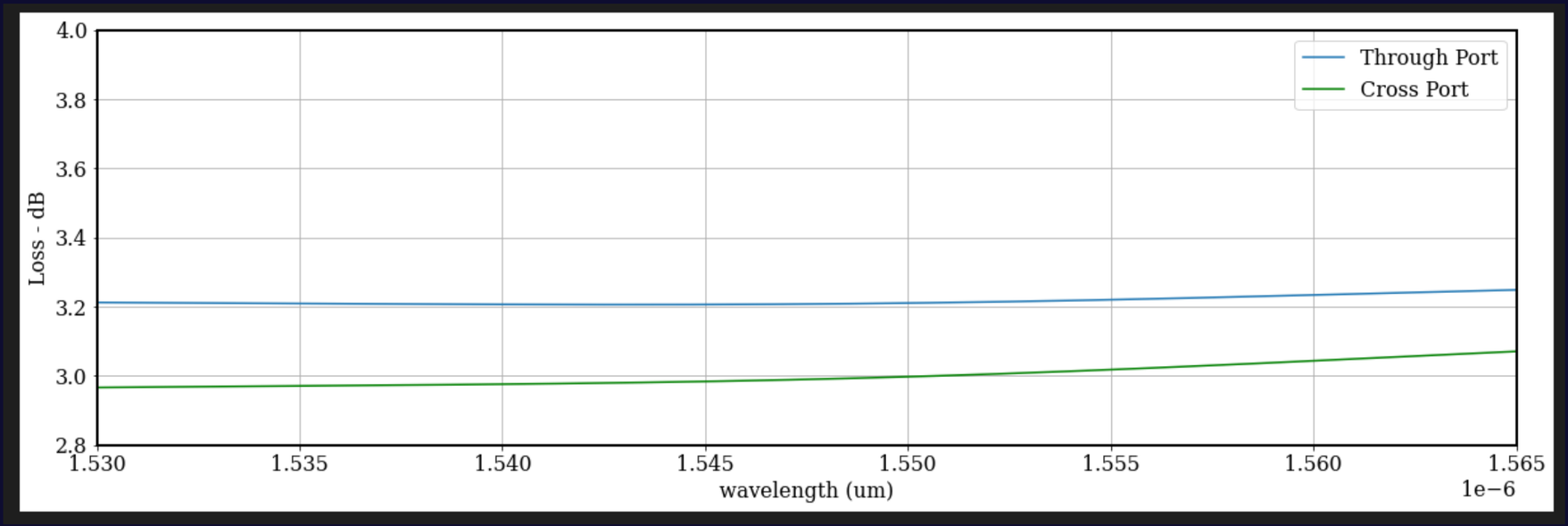
DESIGN - FDTD



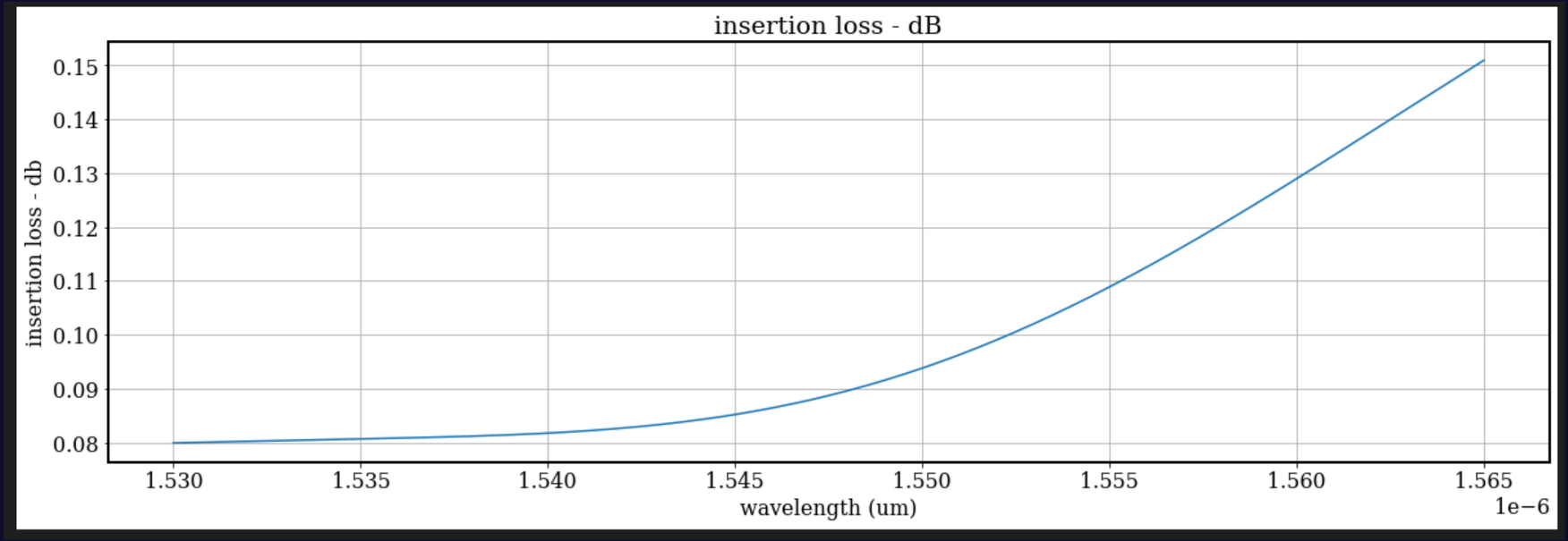
SIMULATION RESULTS - FDTD



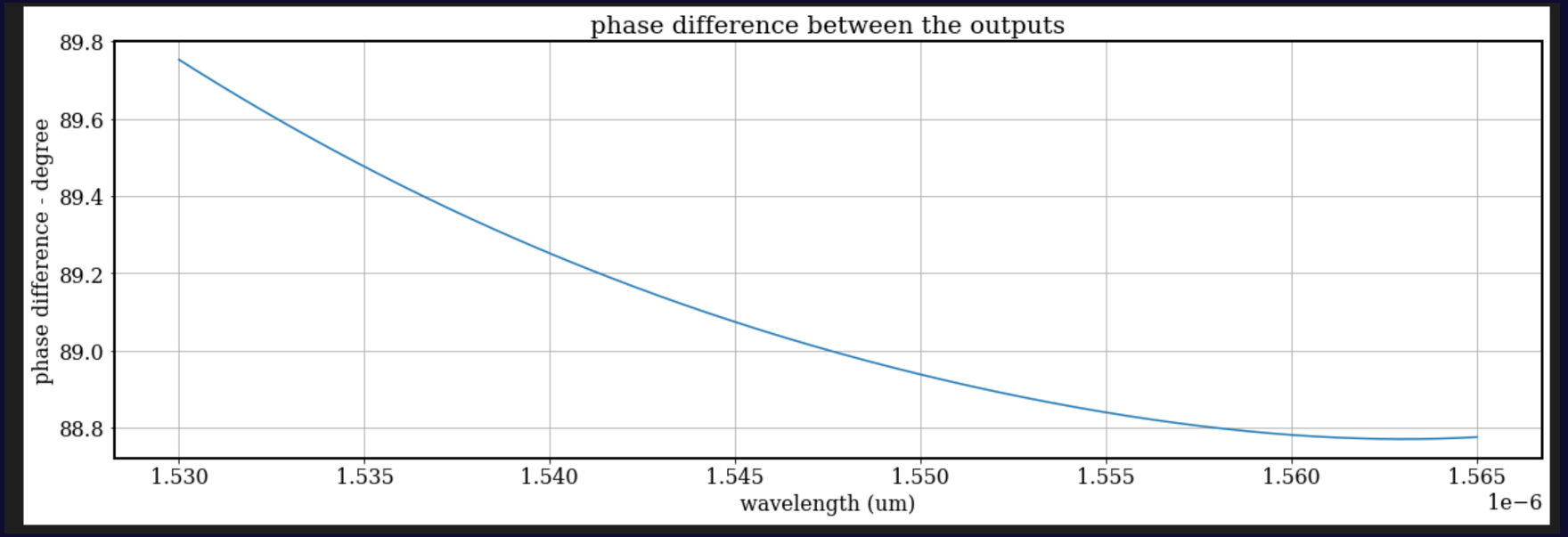
LOSS


Through Port
Cross Port
Loss - dB
4.0
3.8
3.6
3.4
3.2
3.0
2.8
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength (um)
1e−6

INSERTION LOSS

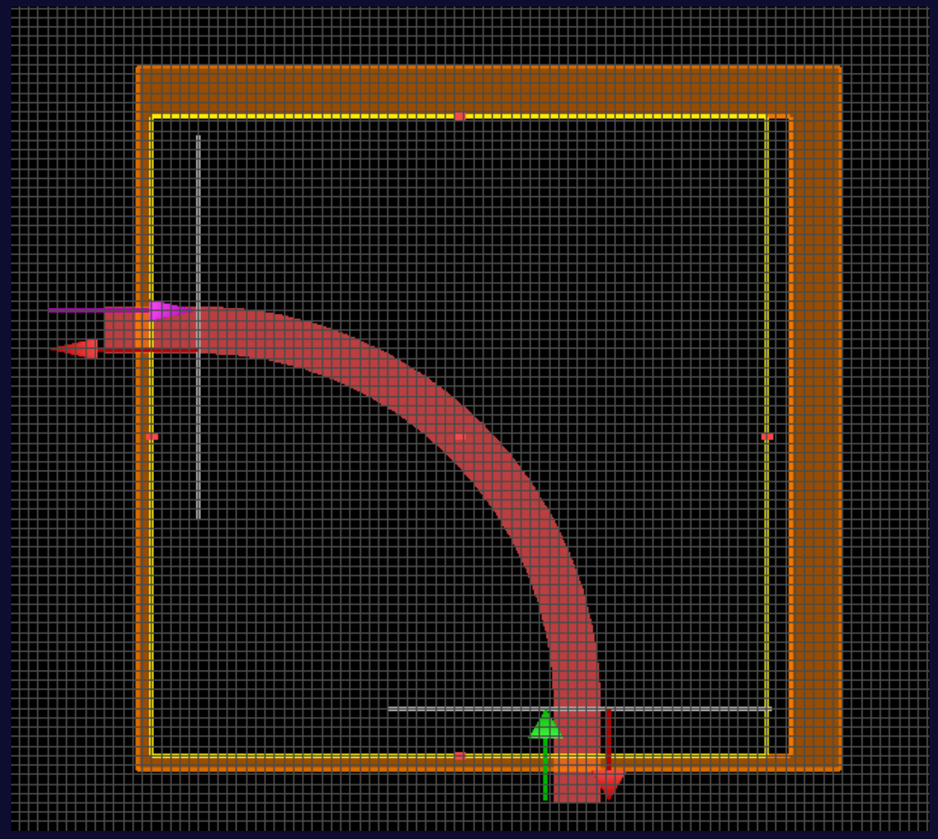


PHASE DIFFERENCE

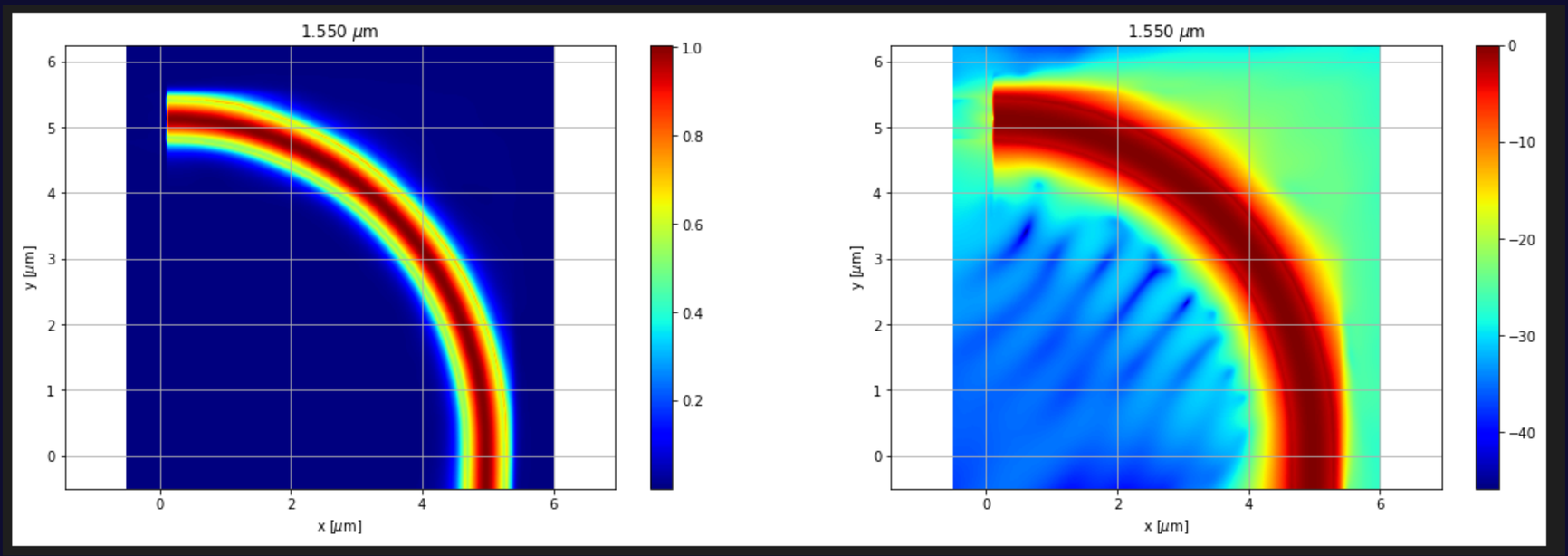


WAVEGUIDE BEND

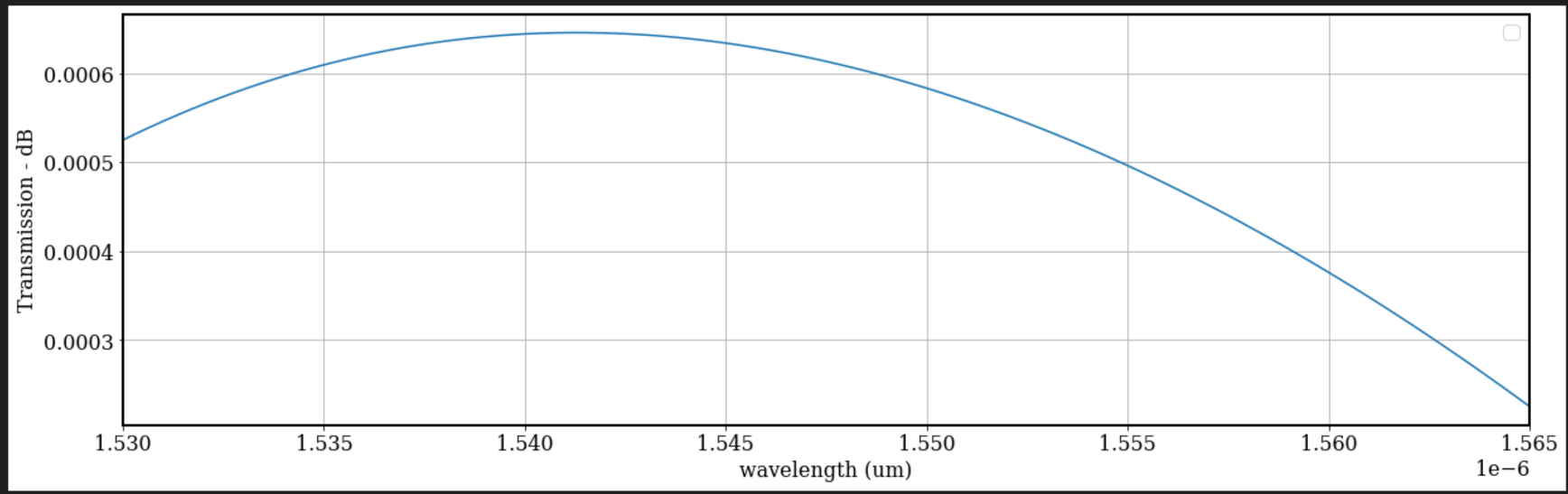
DESIGN



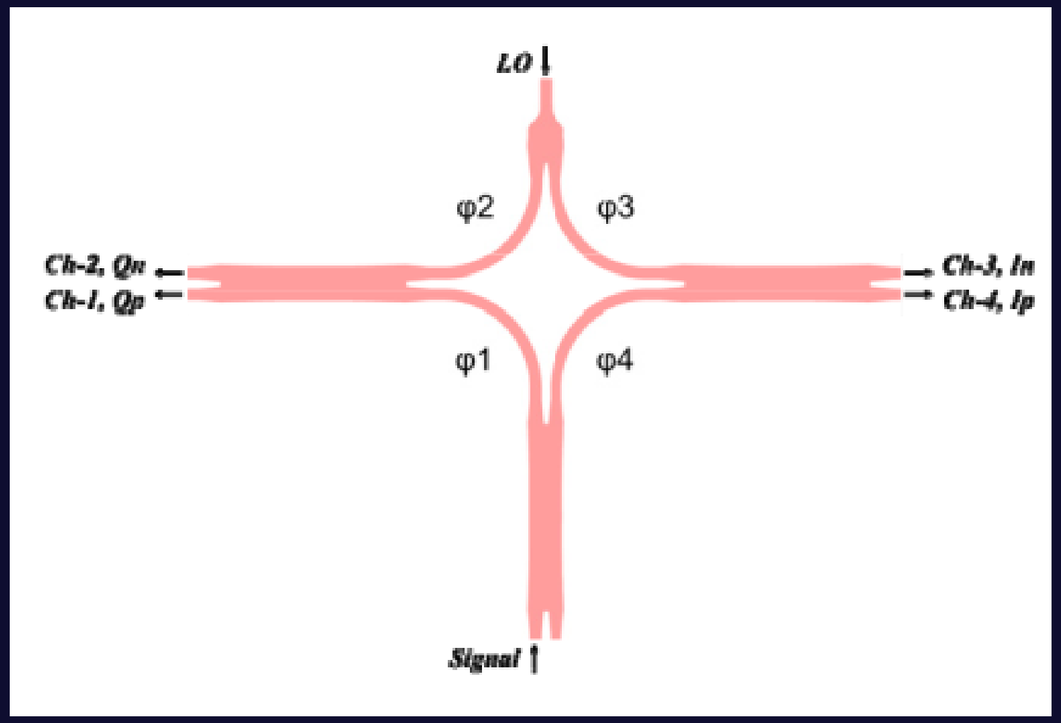
SIMULATION RESULTS

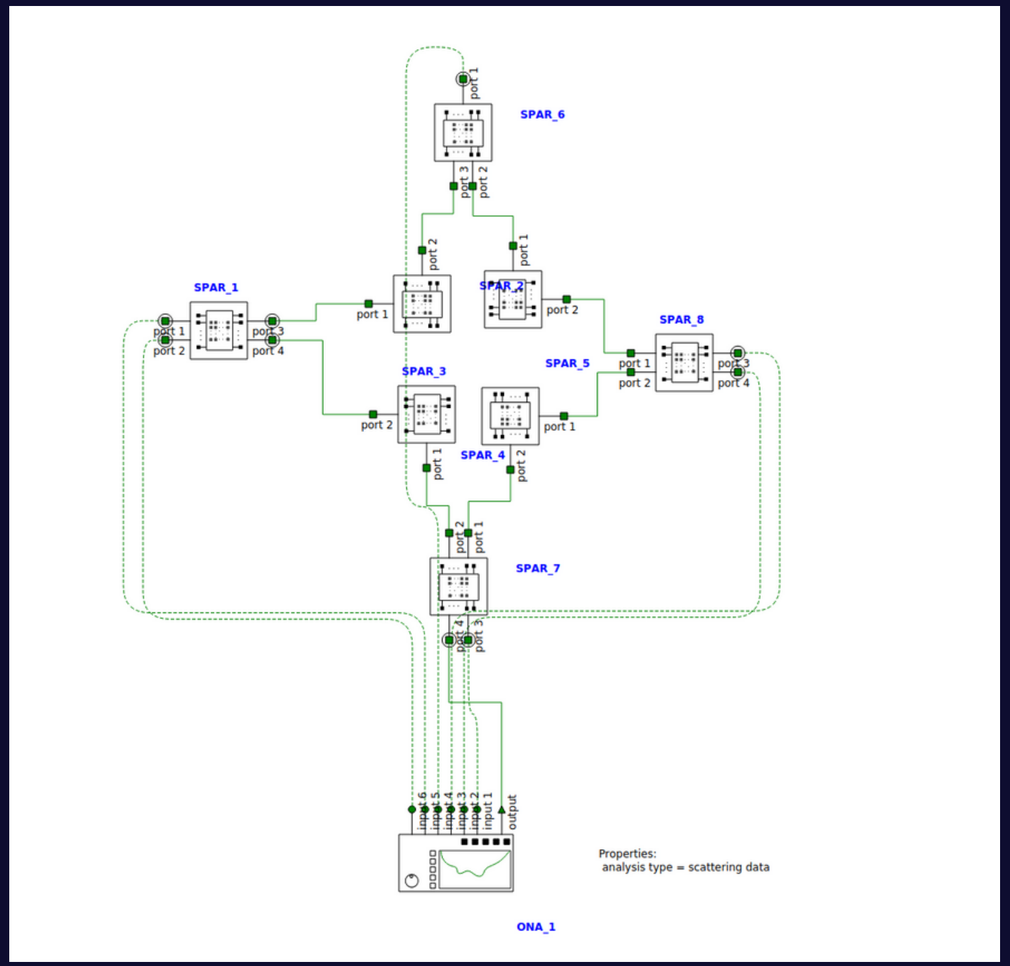


TRANSMISSION

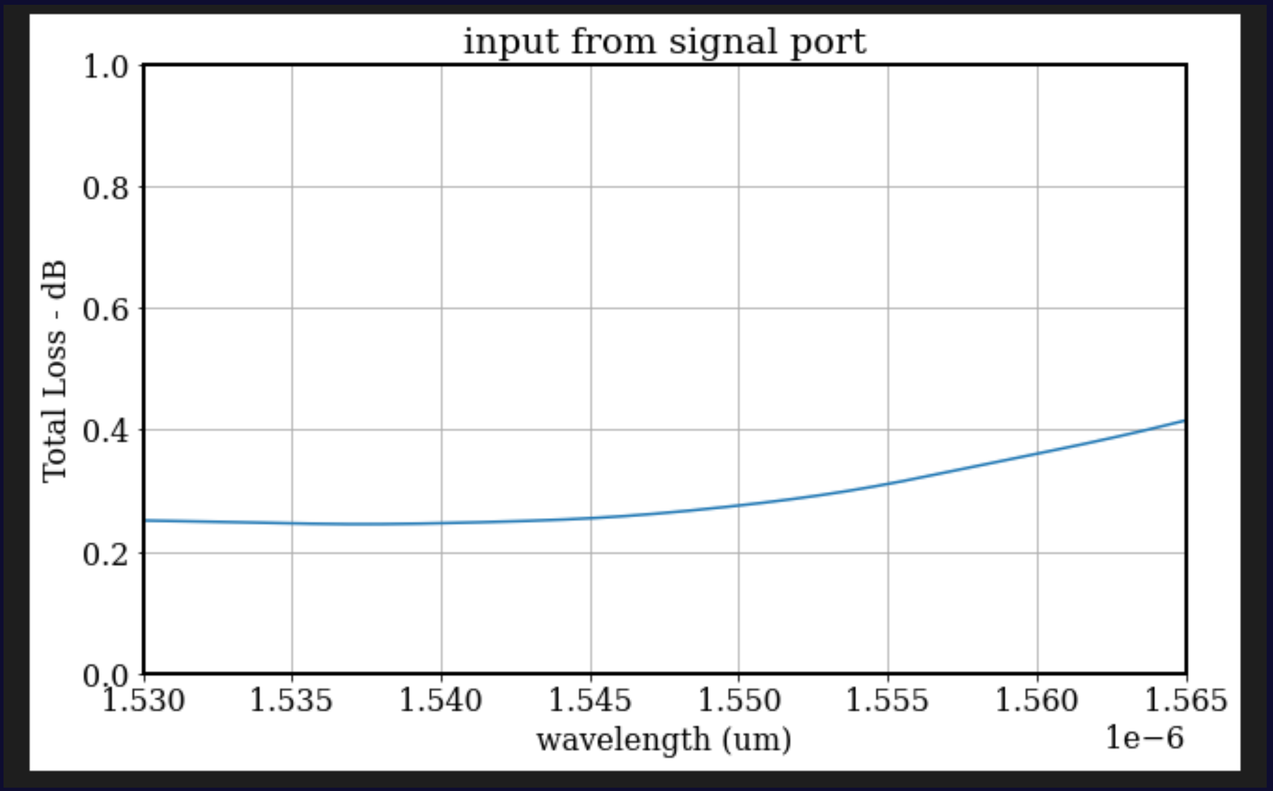


INTERCONNECT

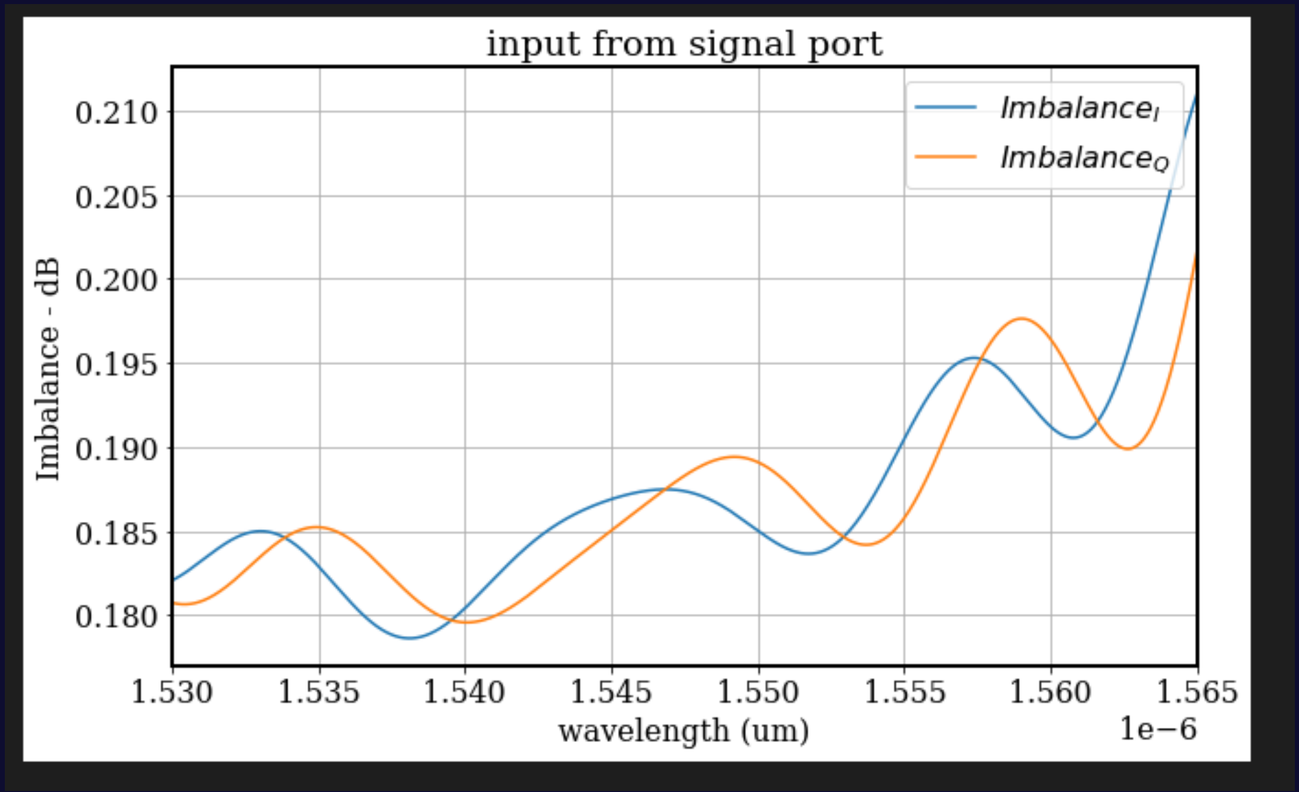




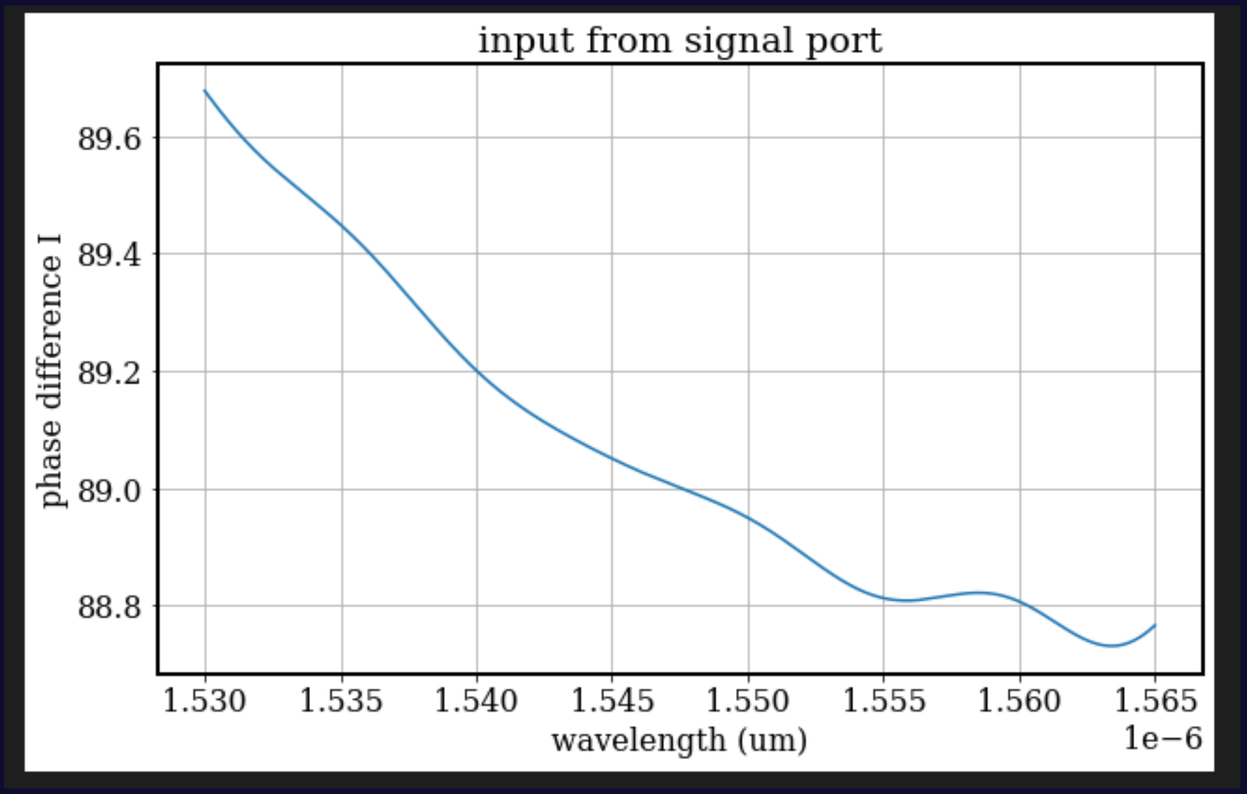
LOSS

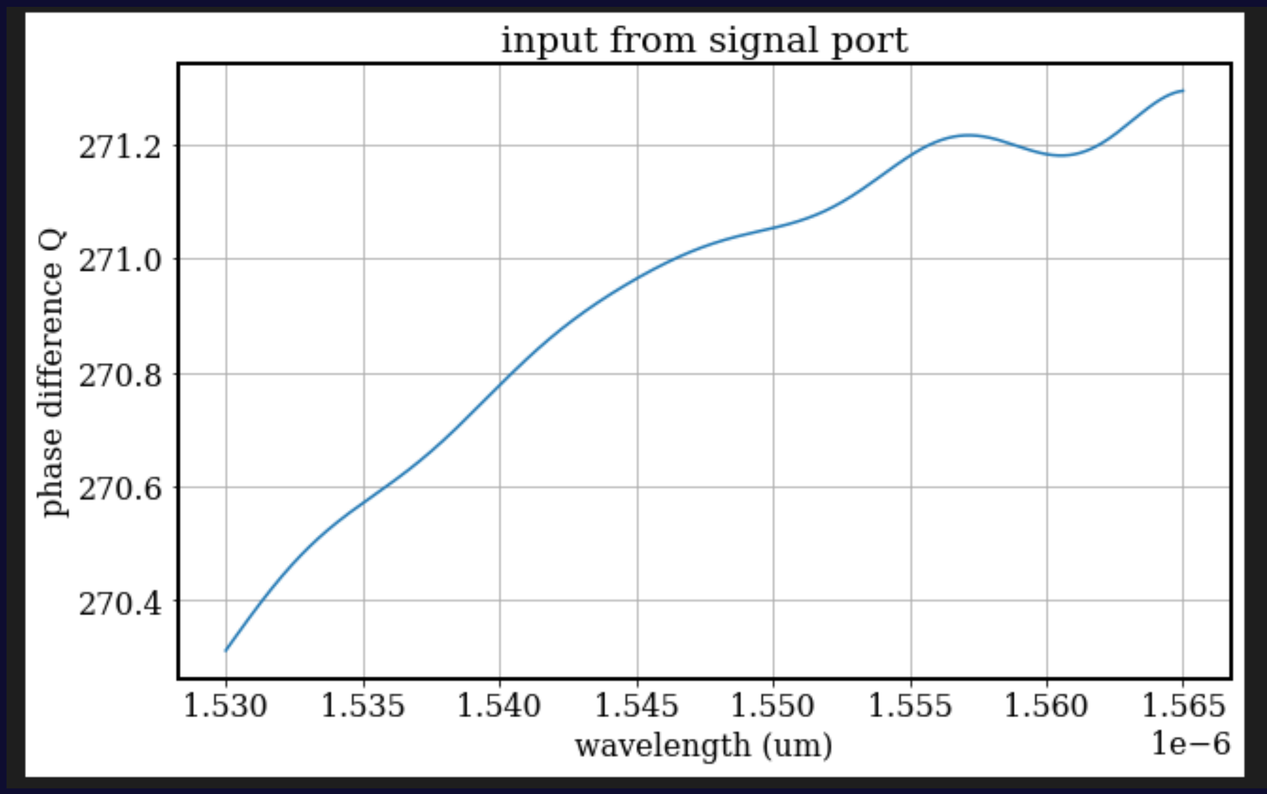

input from signal port
Total Loss - dB
1.0
0.8
0.6
0.4
0.2
0.0
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength (um)
1e−6

IMBALANCE

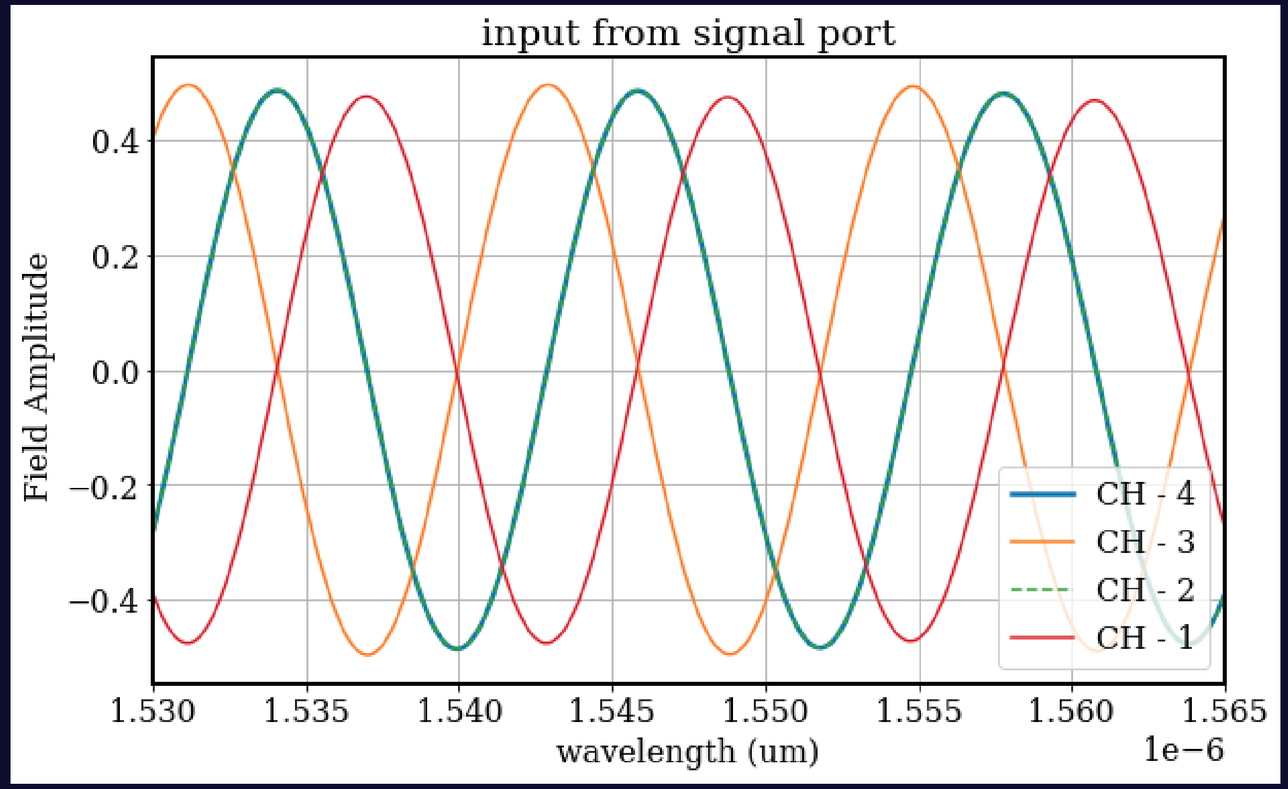

input from signal port
Imbalance - dB
0.210
0.205
0.200
0.195
0.190
0.185
0.180
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength (um)
1e−6
Imbalance$_I$
Imbalance$_Q$

PHASE DIFFERENCE

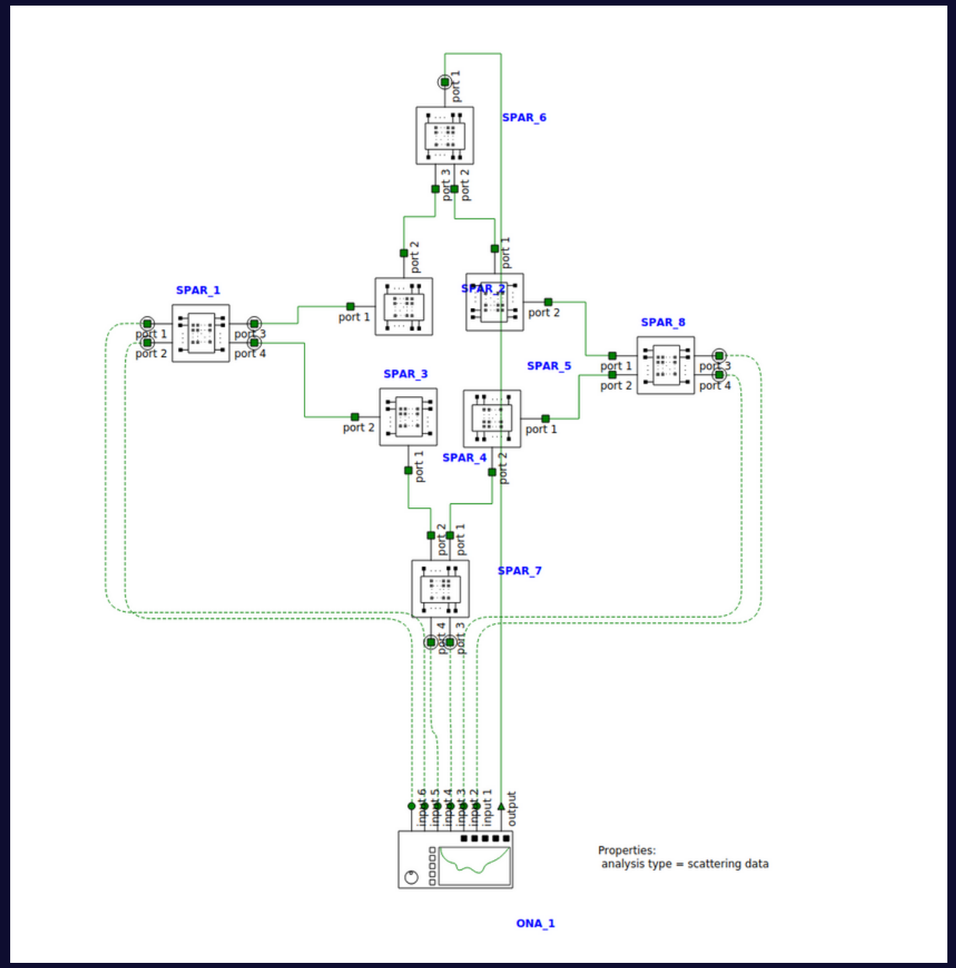




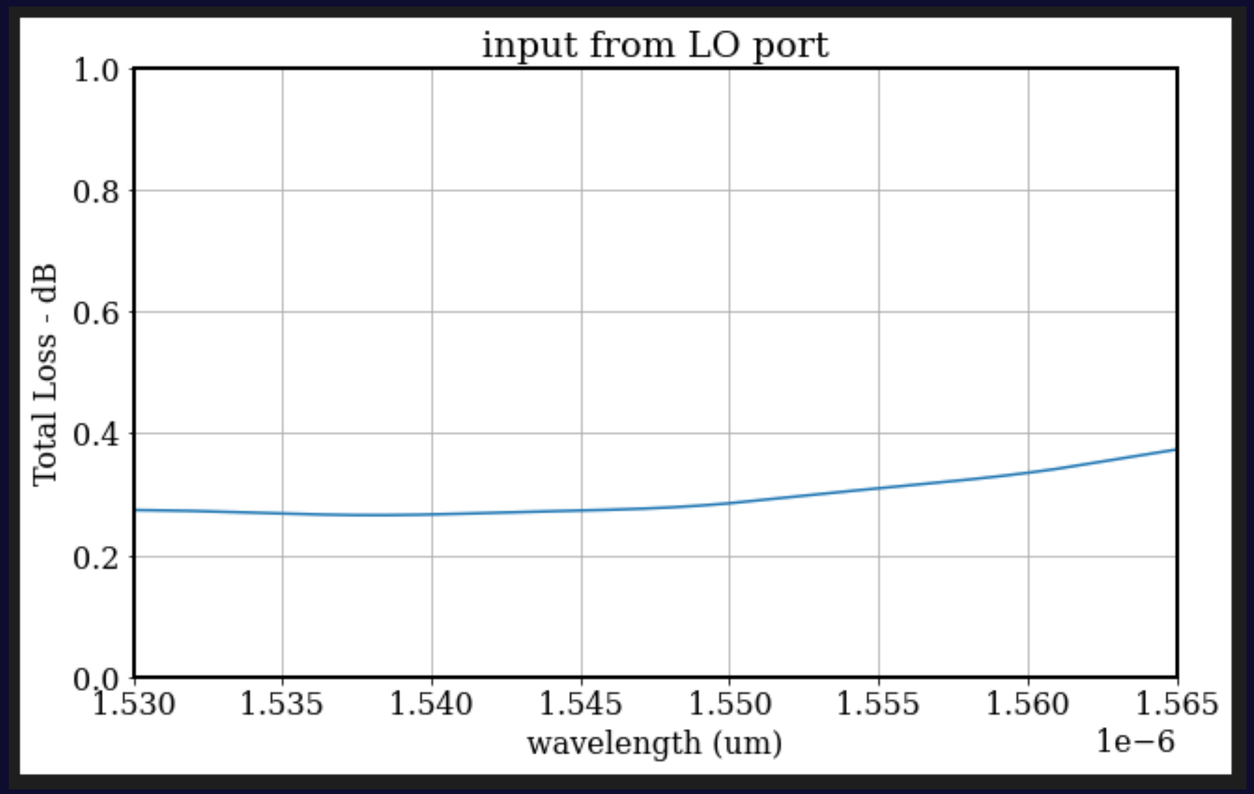
FIELD AMPLITUDE



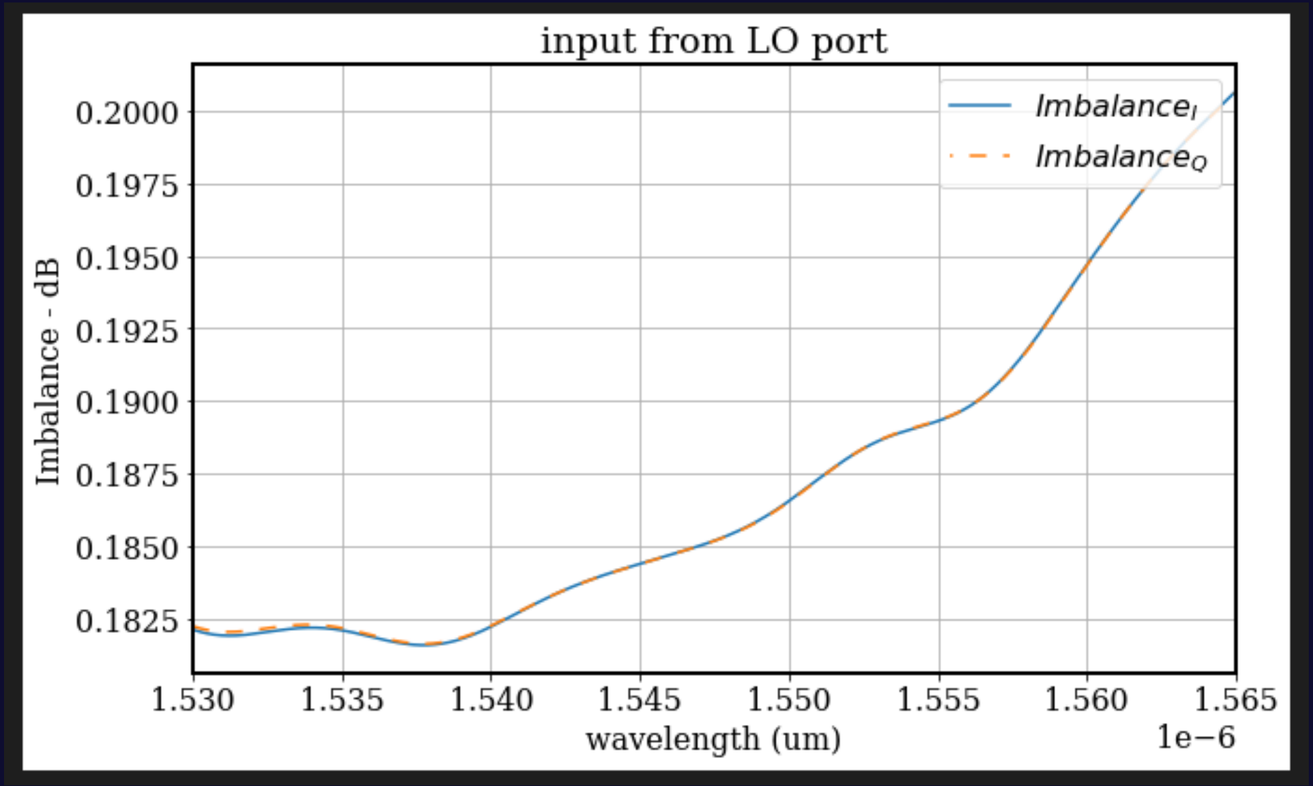
INPUT FROM LO PORT



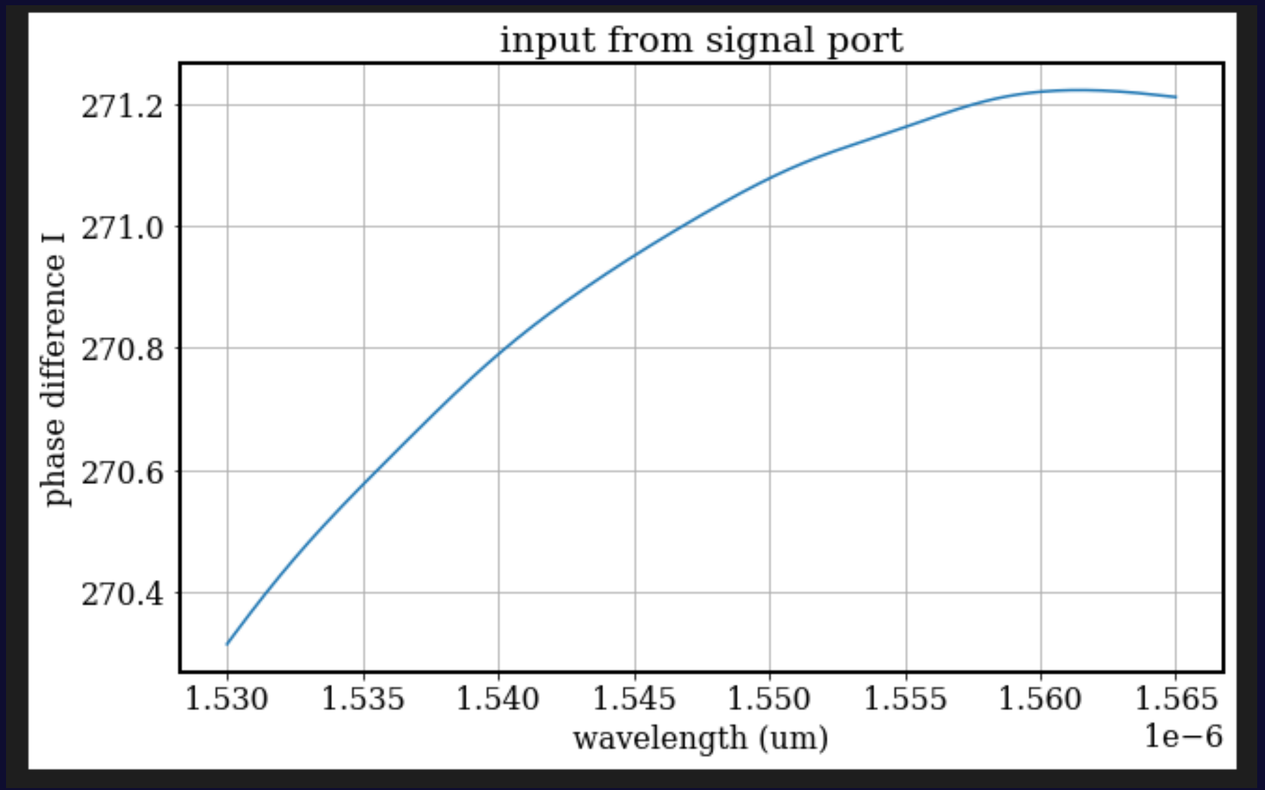
TOTAL LOSS

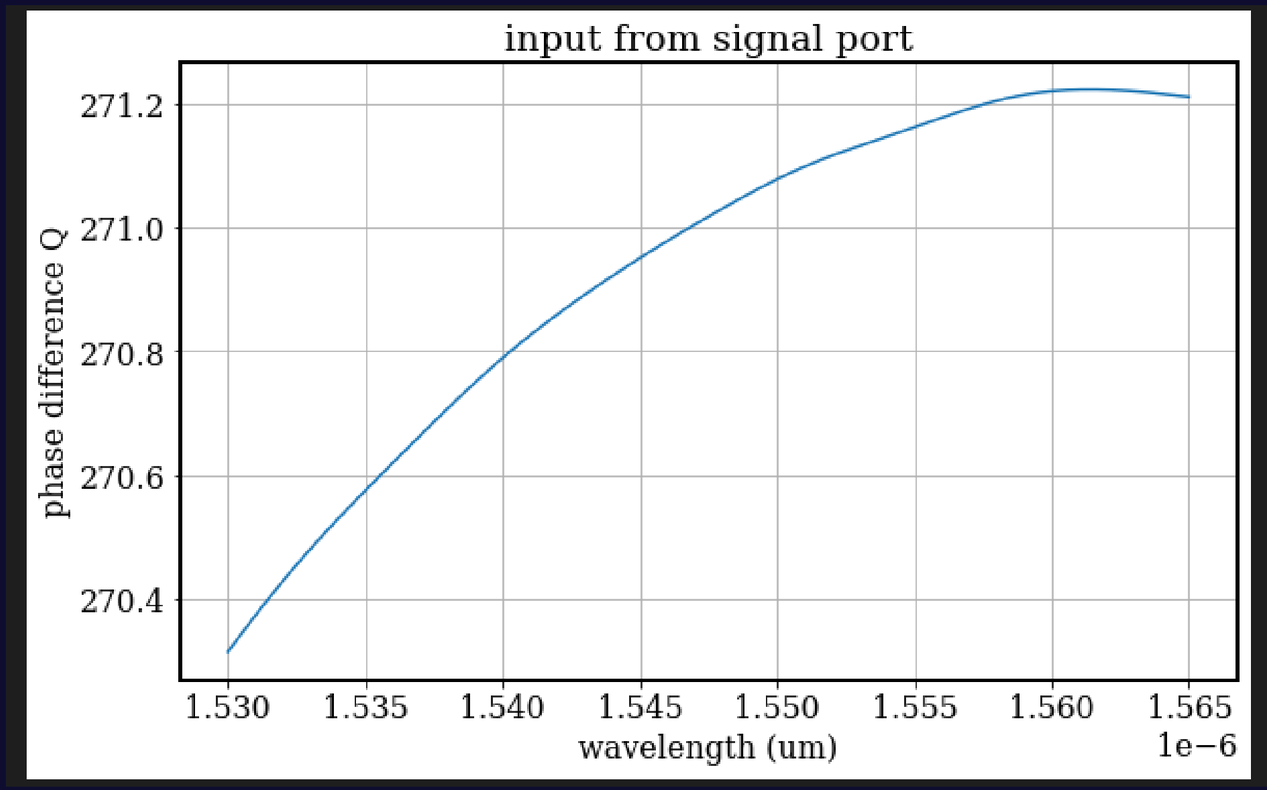

input from LO port
Total Loss - dB
1.0
0.8
0.6
0.4
0.2
0.0
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength (um)
1e−6

IMBALANCE


input from LO port
Imbalance - dB
0.2000
0.1975
0.1950
0.1925
0.1900
0.1875
0.1850
0.1825
1.530
1.535
1.540
1.545
1.550
1.555
1.560
1.565
wavelength (um)
1e−6
Imbalance$_I$
Imbalance$_Q$

PHASE DIFFERENCE





FIELD AMPLITUDE