

DESIGN MMI

2 X 4

Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Introdução

Solver utilizado: EME

Dimensões dos guias: 0.45 x 0.22 (um)

name

General EME setup Transverse mesh settings Boundary conditions Material Advanced options

cell geometry

x min (um) number of cell groups

energy conservation number of modes for all cell groups

☒ allow custom eigensolver settings

cell group definition

	group spans (um)	cells	subcell method	modes	custom	cell range	start (um)	stop (um)
1	6	15	CVCS	10	default	[1 ... 15]	-6	3.55271e-15
2	59.5	1	none	60	default	[16]	3.55271e-15	59.5
3	6	15	CVCS	10	default	[17 ... 31]	59.5	65.5

☒ display cells

y (um) y min (um)

y span (um) y max (um)

z (um) z min (um)

z span (um) z max (um)

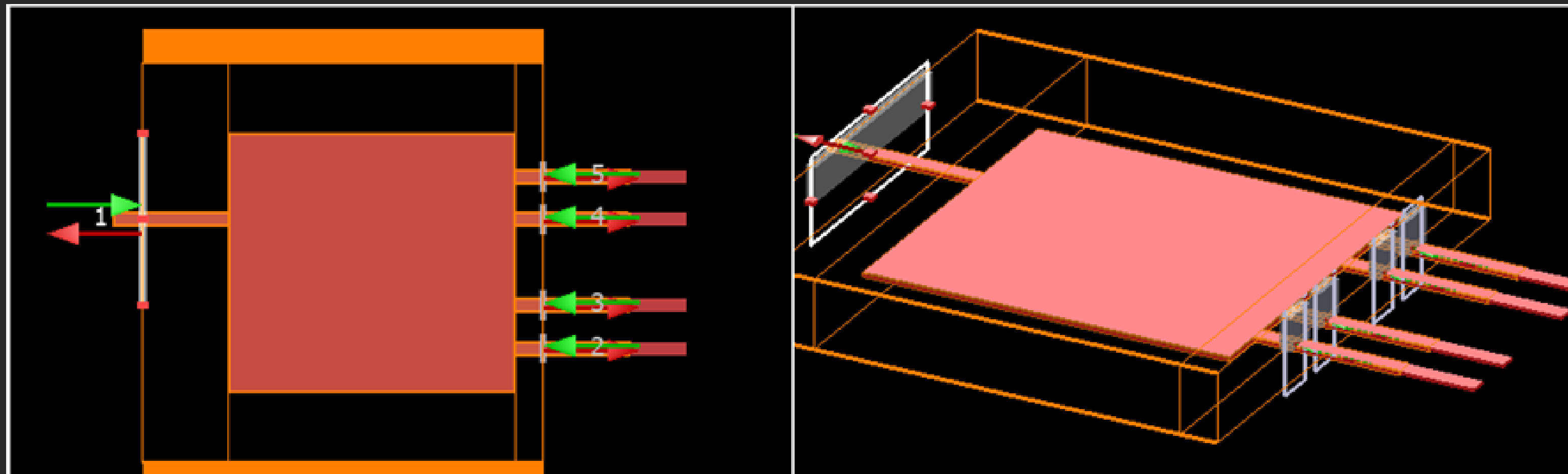
Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Primeiro Design

MMI sem o uso de tappers



Espessura: 8 μm

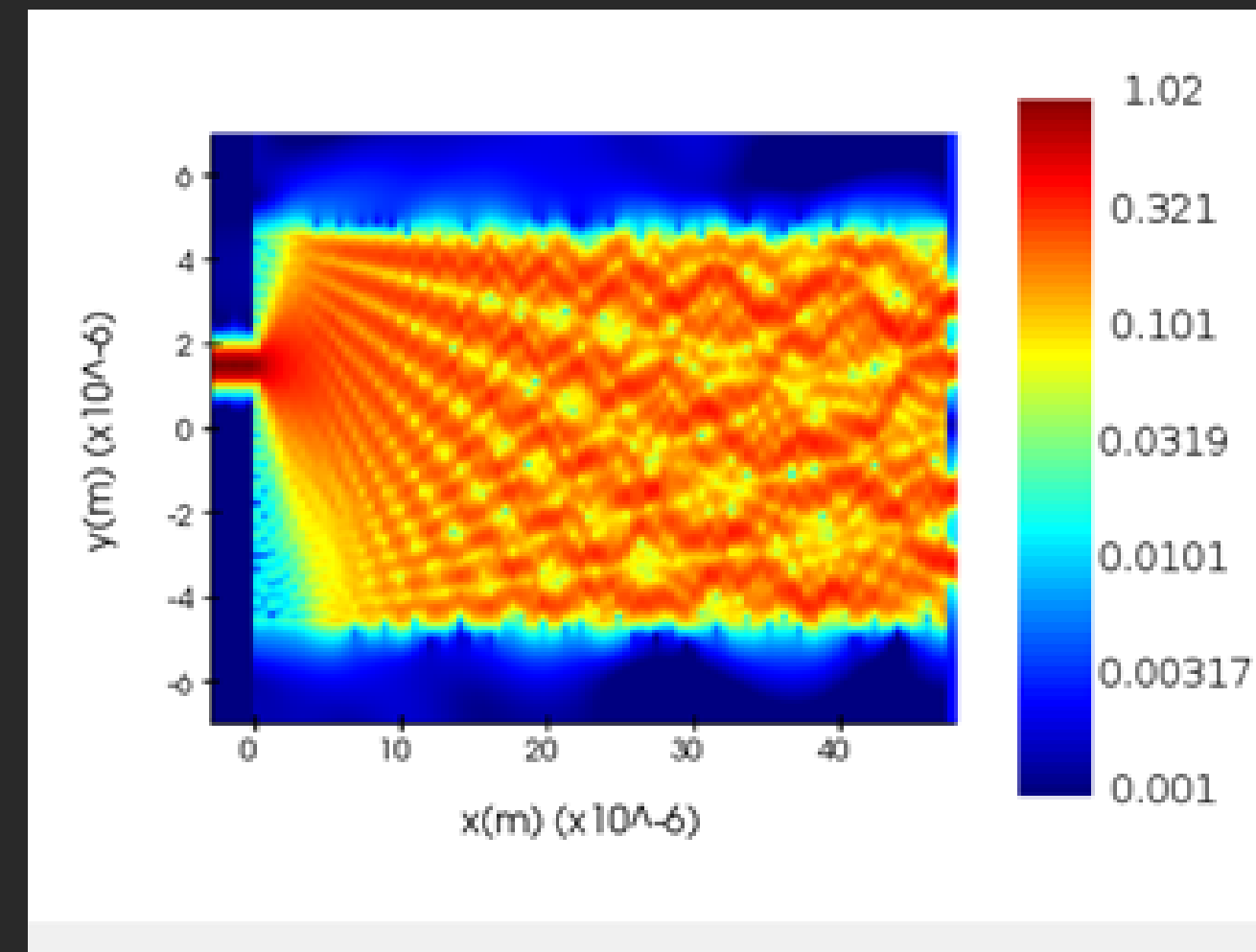
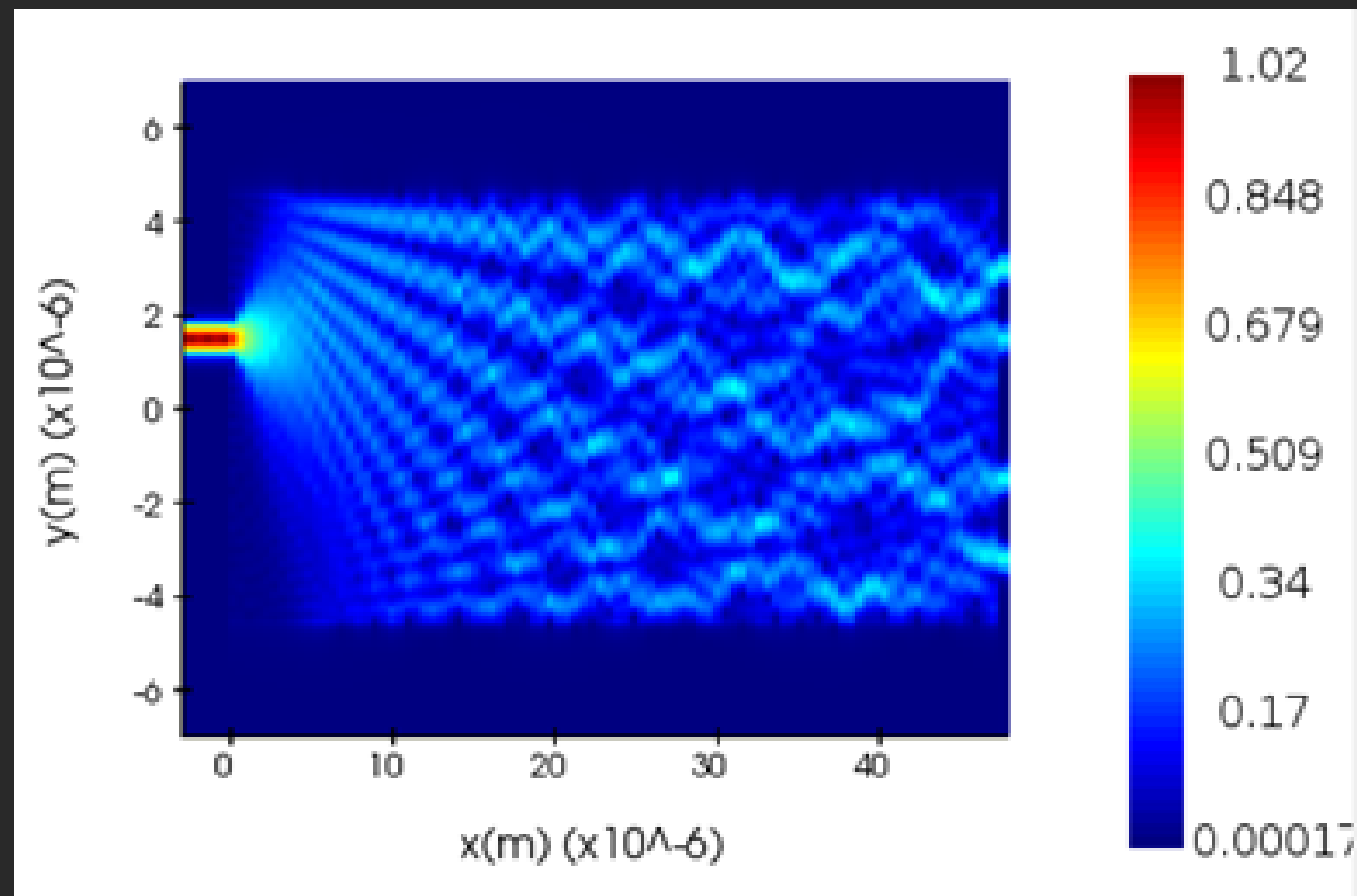
Comprimento do MMI: 37.3 μm

Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Resultados



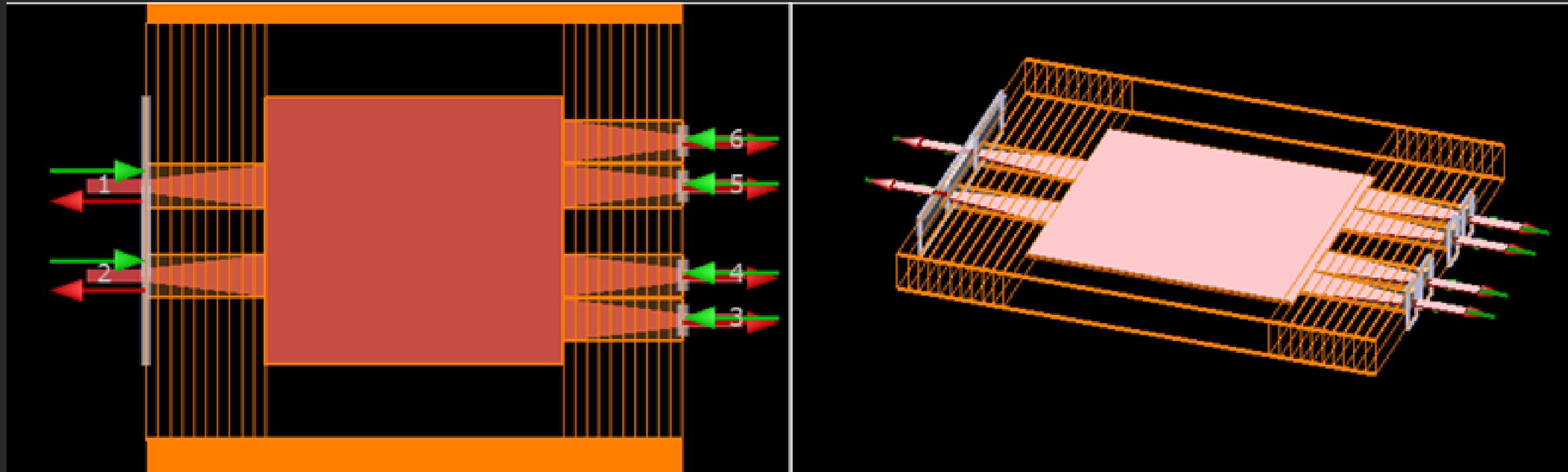
Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Segundo Design

MMI com tappers



Espessura: 8 μm

Comprimento do MMI: 37.3 μm

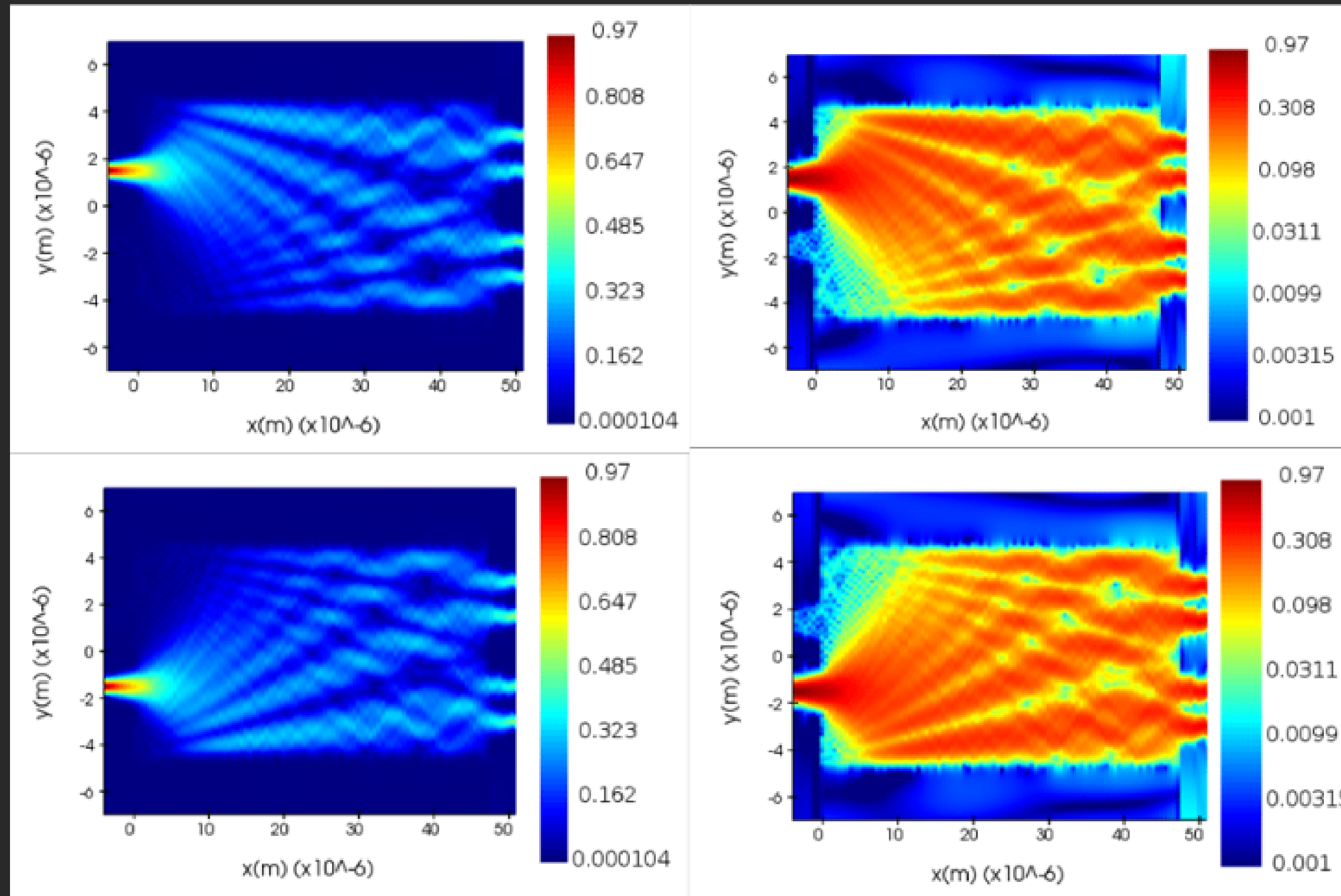
Espessurados Tappers: 1.3 μm

Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Resultados

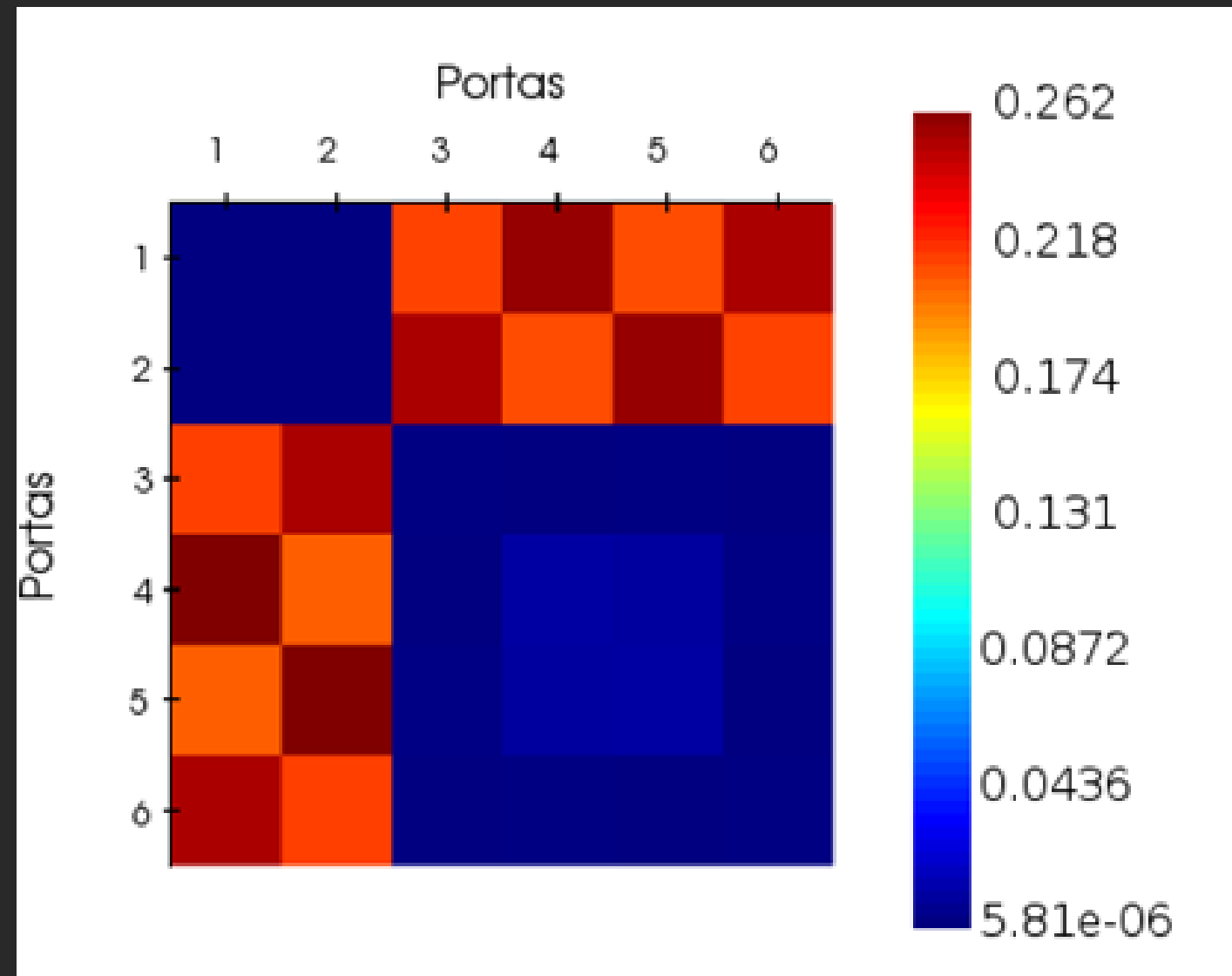


Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Resultados



	1	2	3	4	5	6
1	2.17241e-05	5.80568e-06	0.212162	0.255831	0.20957	0.250651
2	5.80568e-06	2.17241e-05	0.250651	0.20957	0.255831	0.212162
3	0.212995	0.250784	0.00121246	0.000212234	0.00115945	0.000766812
4	0.26156	0.204975	0.000178732	0.00899923	0.00809438	0.0013391
5	0.204975	0.26156	0.0013391	0.00809438	0.00899923	0.000178733
6	0.250784	0.212996	0.000766812	0.00115945	0.000212234	0.00121246

Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Otimizações

Espessura do MMI: 10 μm

Espessura dos tappers: 1.5 μm

Comprimento teorico do MMI: 57.8 μm

	1	2	
1	1.47245e-06	4.56628e-08	0
2	4.56628e-08	1.47245e-06	0
3	0.218814	0.2612	0
4	0.260671	0.227093	0
5	0.227093	0.260671	0
6	0.2612	0.218814	0

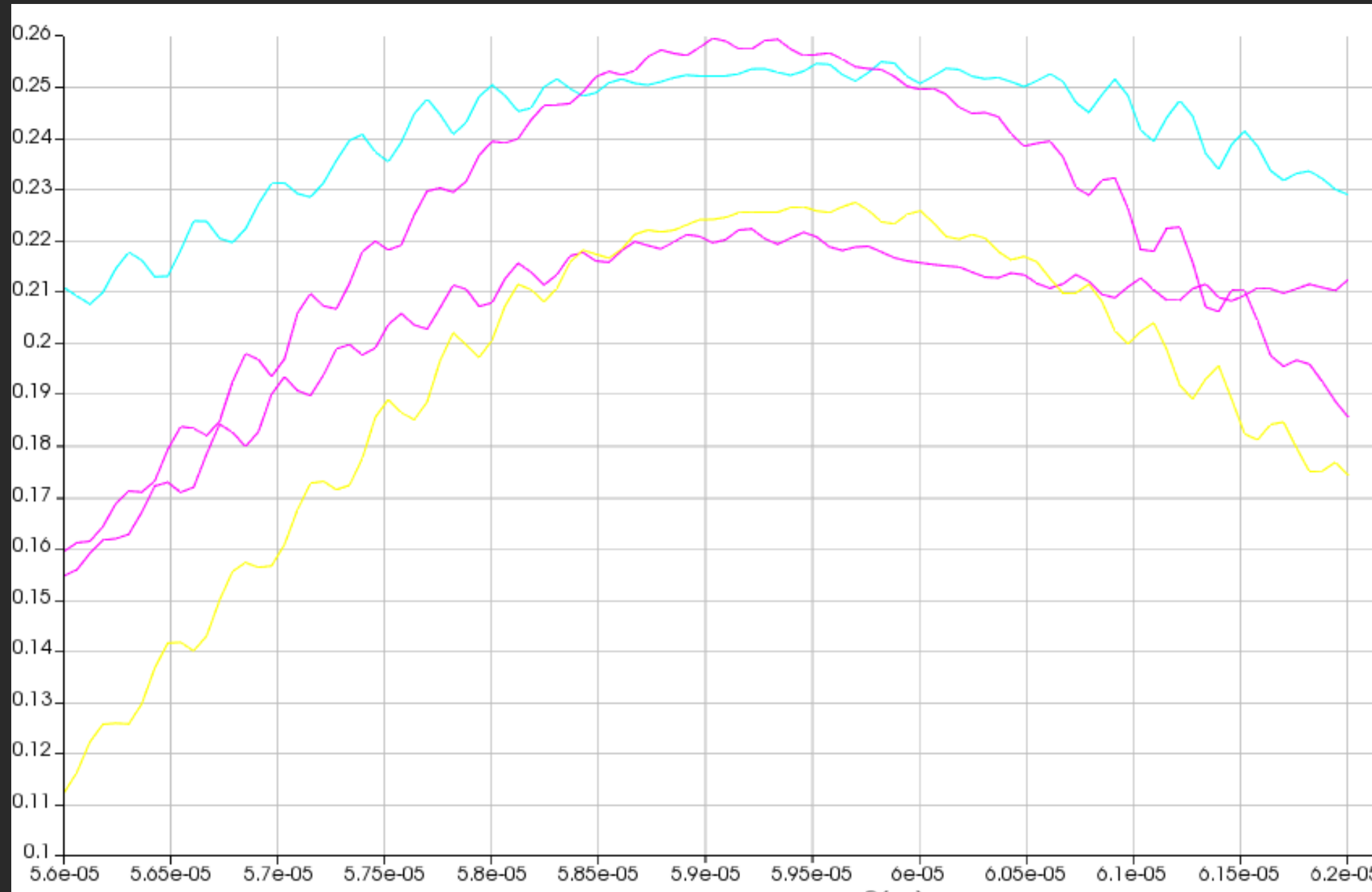
Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Otimizações

Analise comprimento experimental



Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Otimizações

Resultados finais EME

	1	2
1	1.34124e-05	2.37324e-06
2	2.37324e-06	1.34114e-05
3	0.221534	0.256149
4	0.254311	0.225973
5	0.225973	0.254311
6	0.256149	0.221534

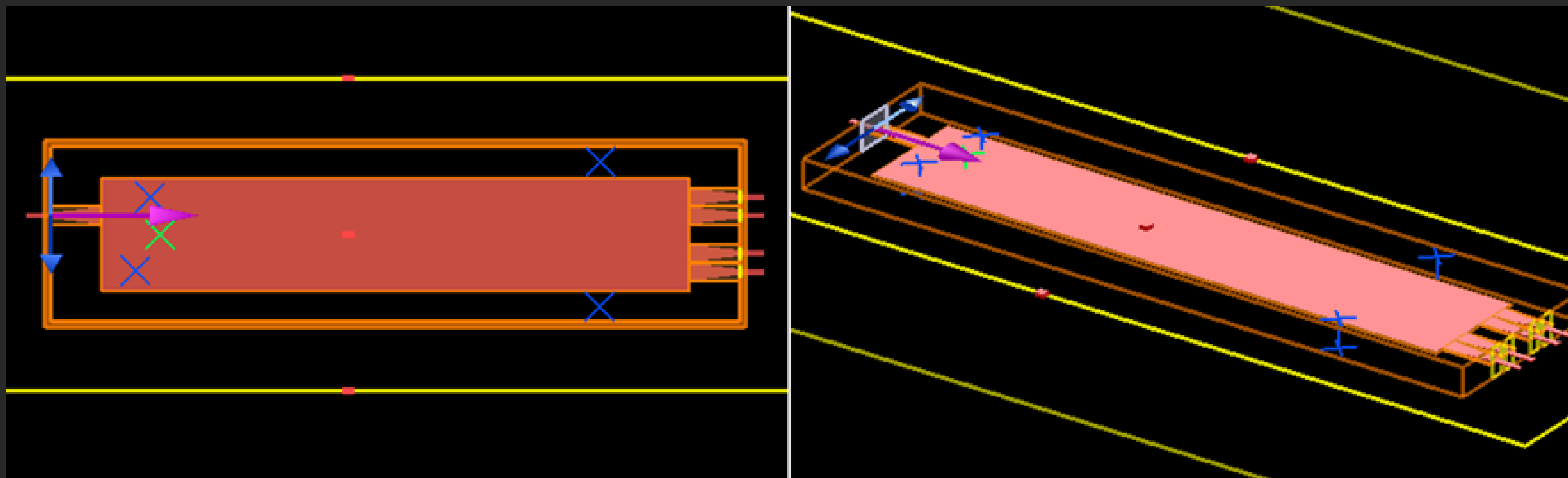
Transmissão de 95%

Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Simulação VarFDTD

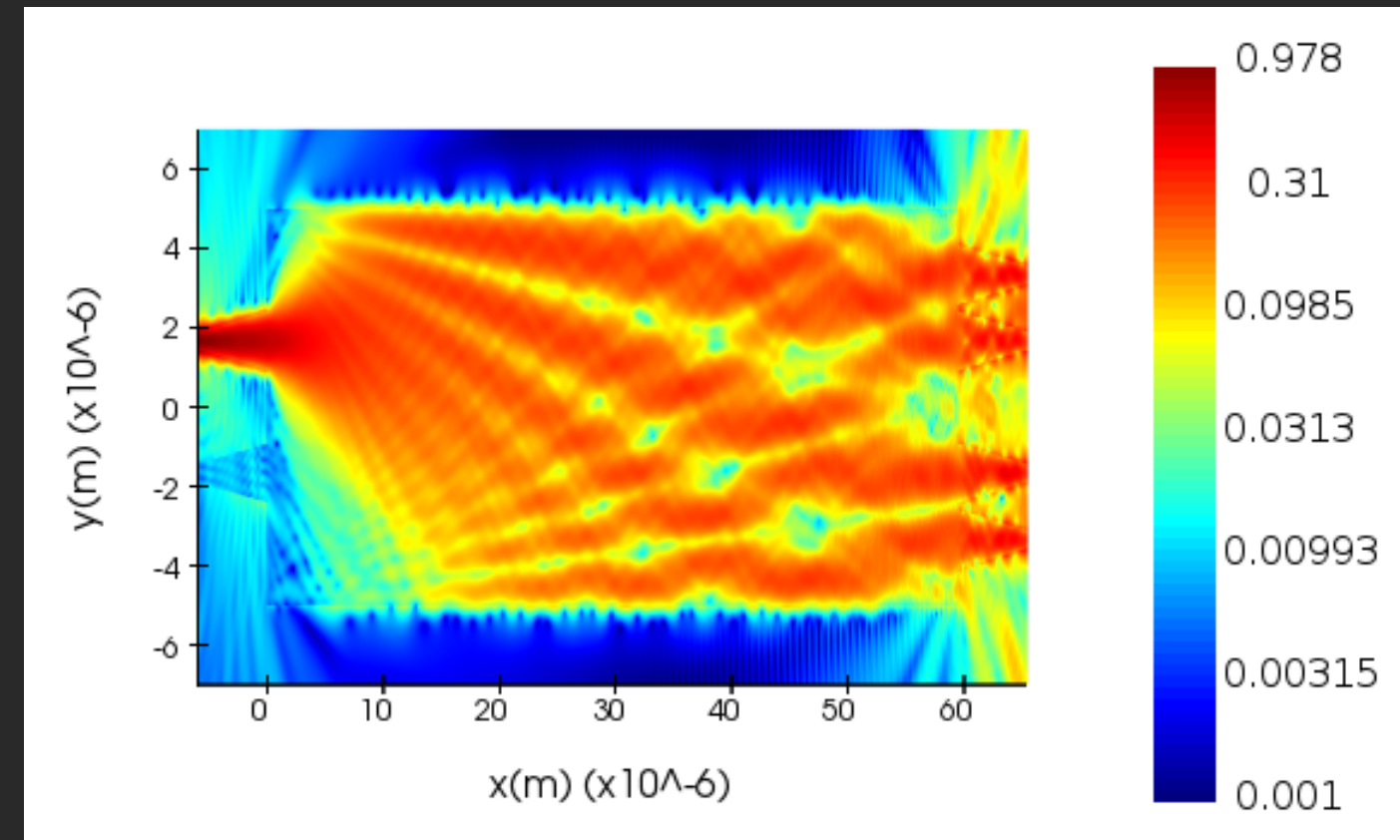
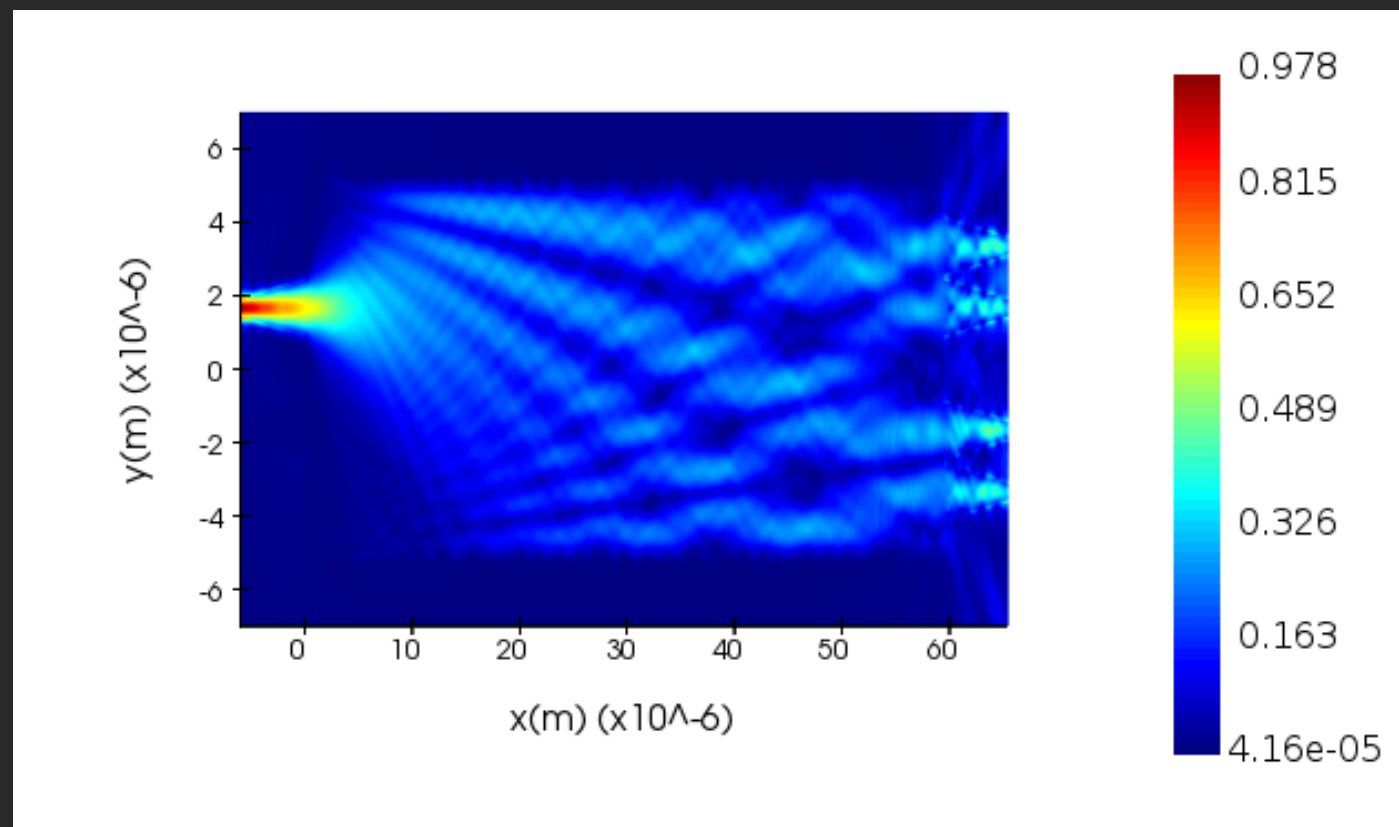


Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Resultados



Lucas De Oliveira Lobo

Capacitação Fotonica

27/05/2022

Bibliografia

- Planar Monomode Optical Couplers Based on Multimode Interference Effects Lucas B. Soldano, Frank B. Veerman, Meint K.. Smit, Bastiaan H. Verbeek, Alain H. Dubost, and Erik C. M. Pennings
- Overlapping-image multimode interference couplers with a reduced number of self-images for uniform and nonuniform power splitting M. Bachmann, P. A. Besse, and H. Melchior