

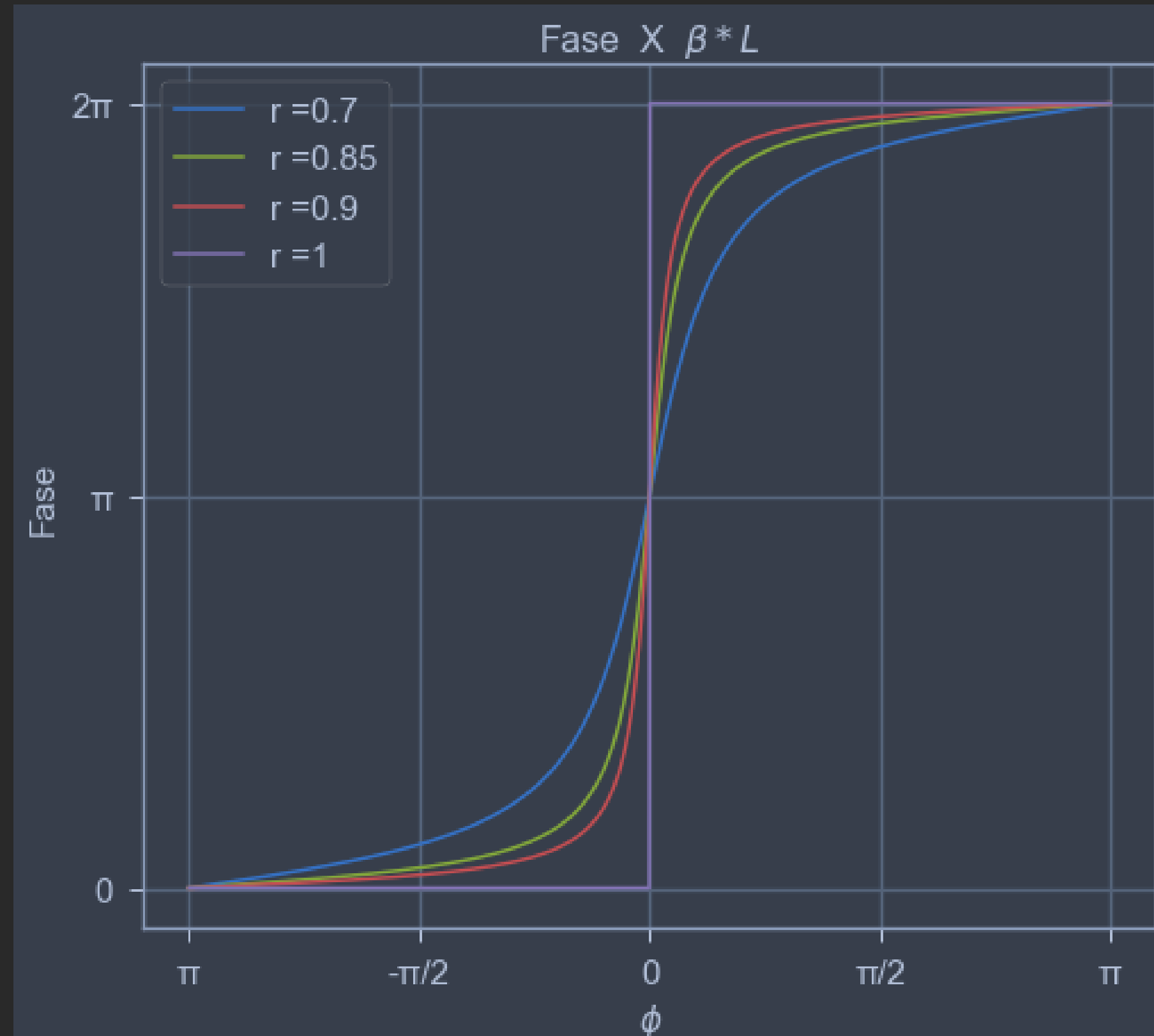
DESIGN

ANEL DE RESSONANCIA

SEMANA 1 E 2

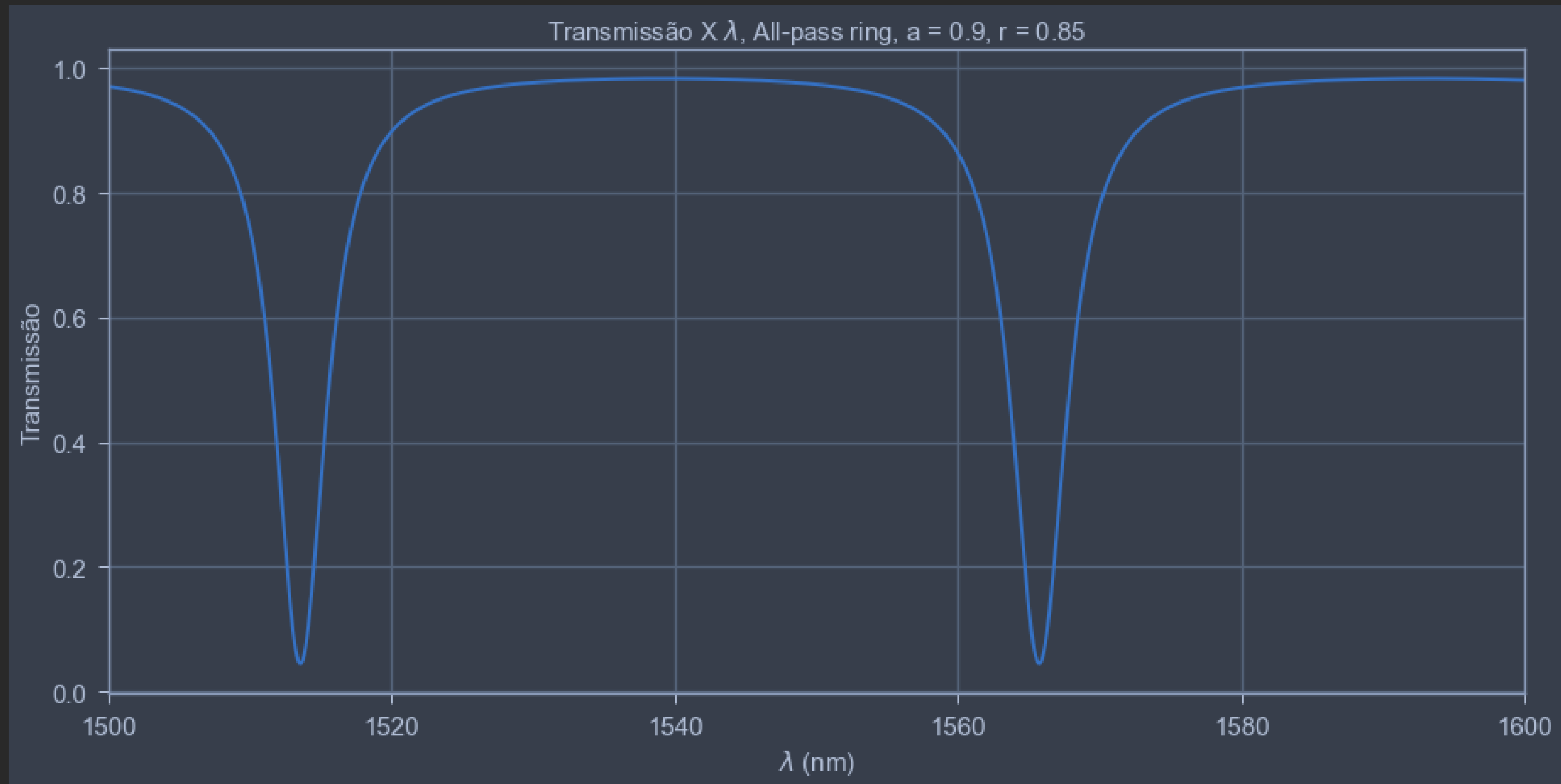
ESTUDO DE REFERENCIAS

GRÁFICOS TEÓRICOS



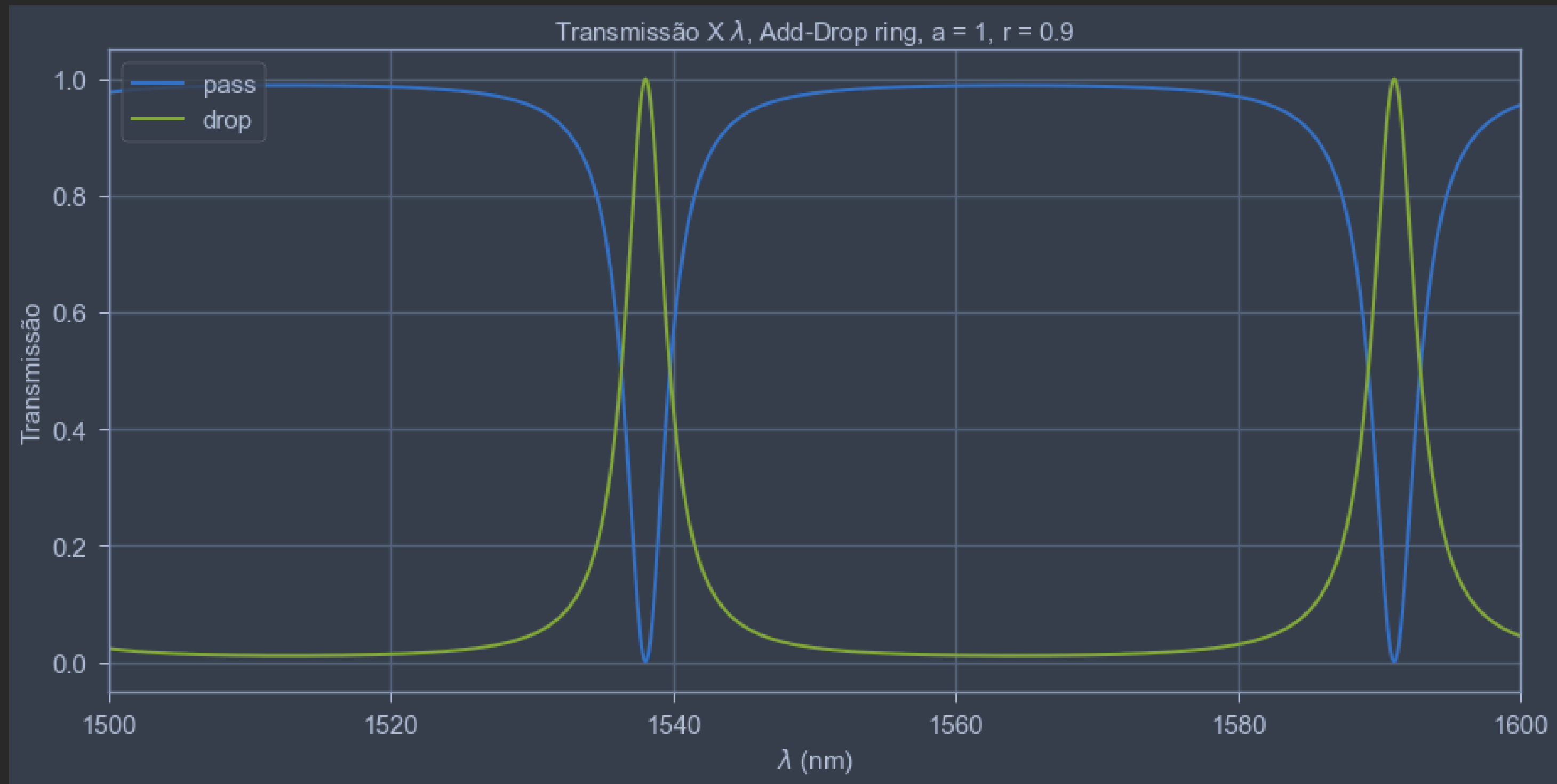
GRÁFICOS TEÓRICOS

Transmissão All pass ring



GRÁFICOS TEÓRICOS

Transmissão Add-drop ring



DESIGN DE UM ANEL DE RESSONÂNCIA

Especificações

FSR = 27.7 nm

FWHM = 0.88 nm

SOI in SiO₂

Guia: 0.45/0.22 μm

gap = 150 nm

Valores Teóricos

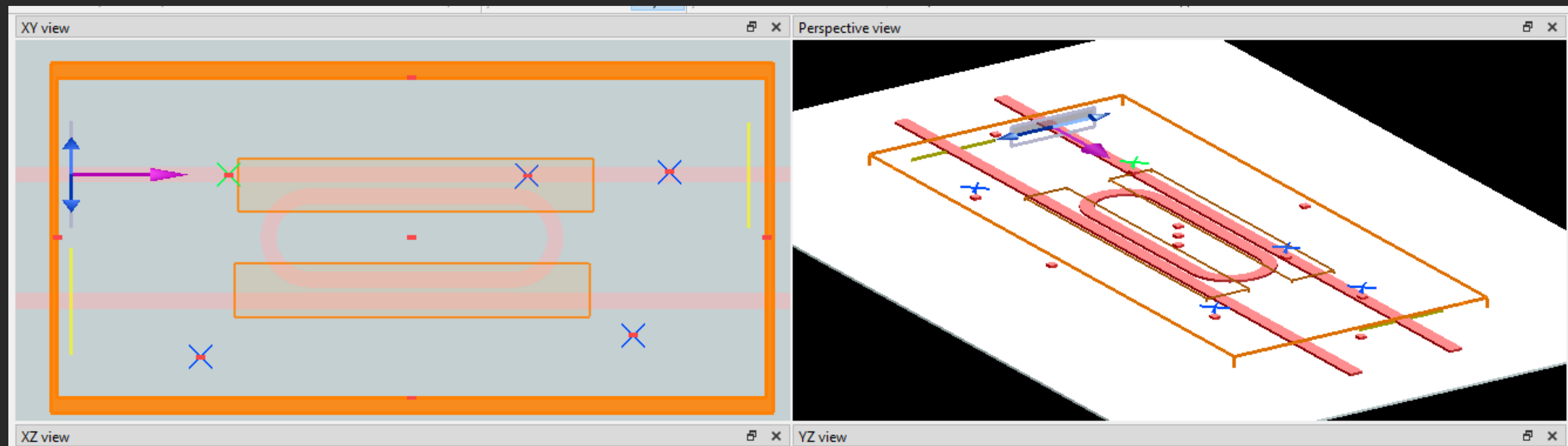
Comprimento total = 18.85 μm

Comprimento de acoplamento = 5.74 μm

Raio = 1.17 μm

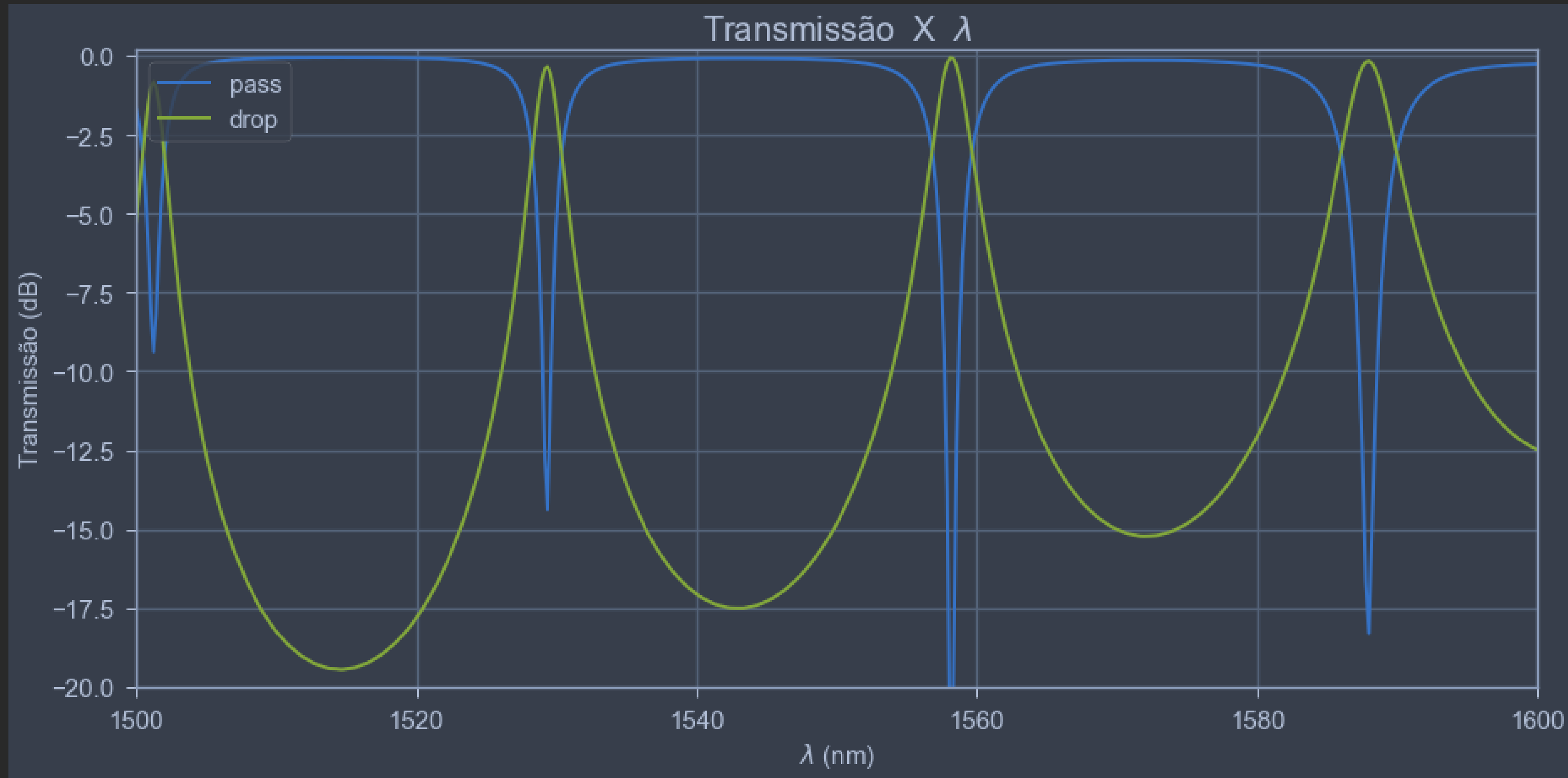
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação



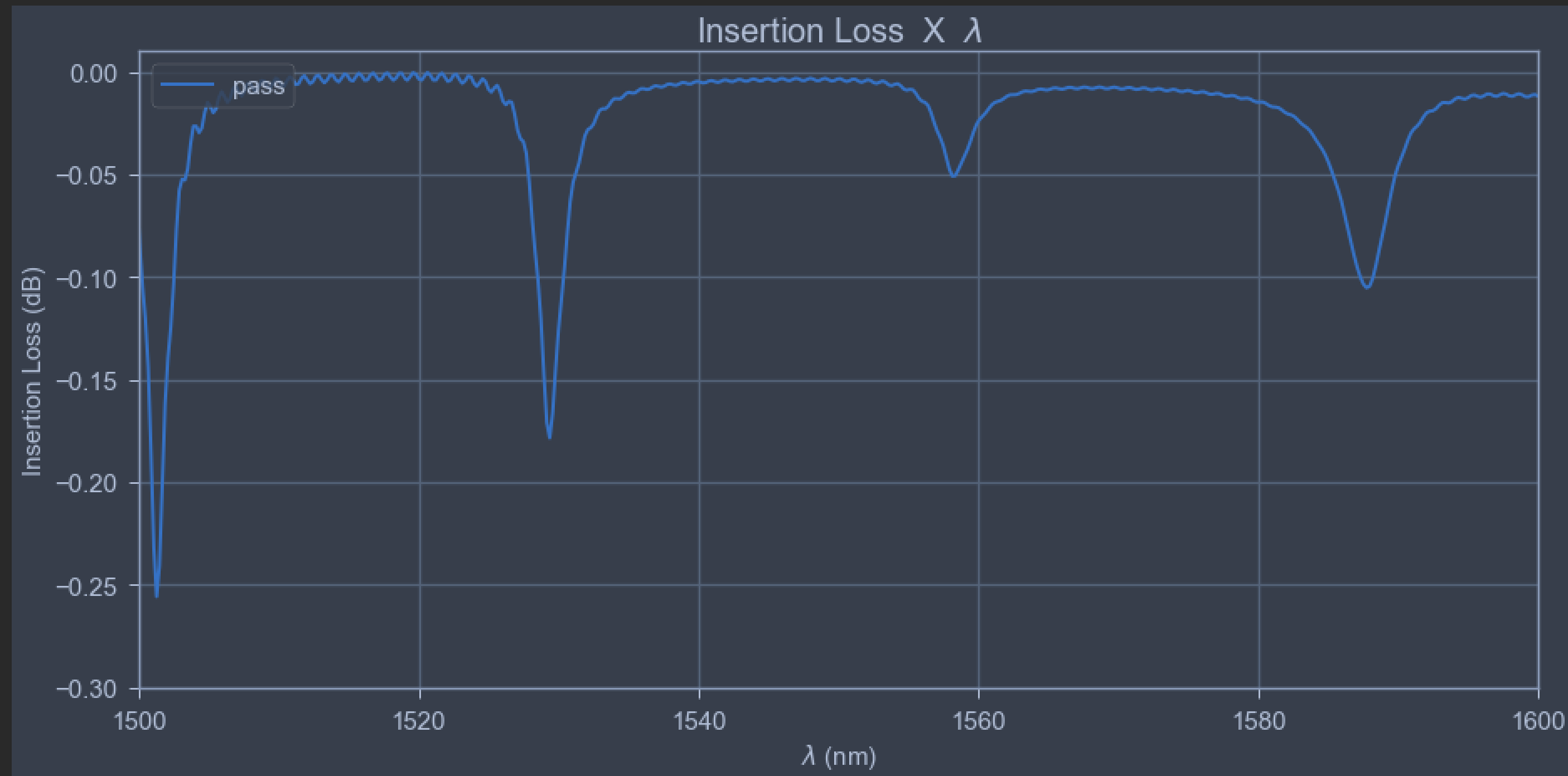
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



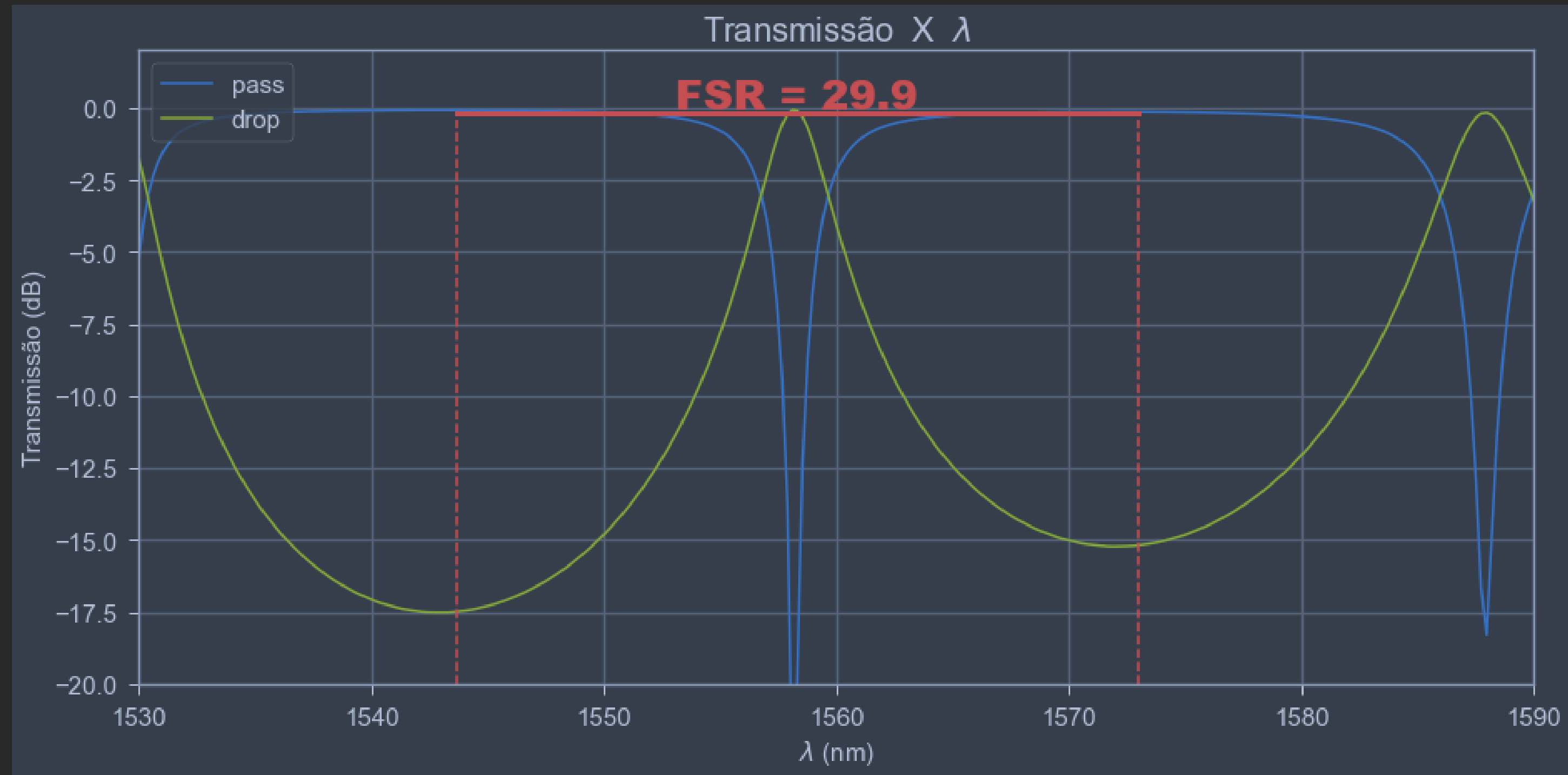
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



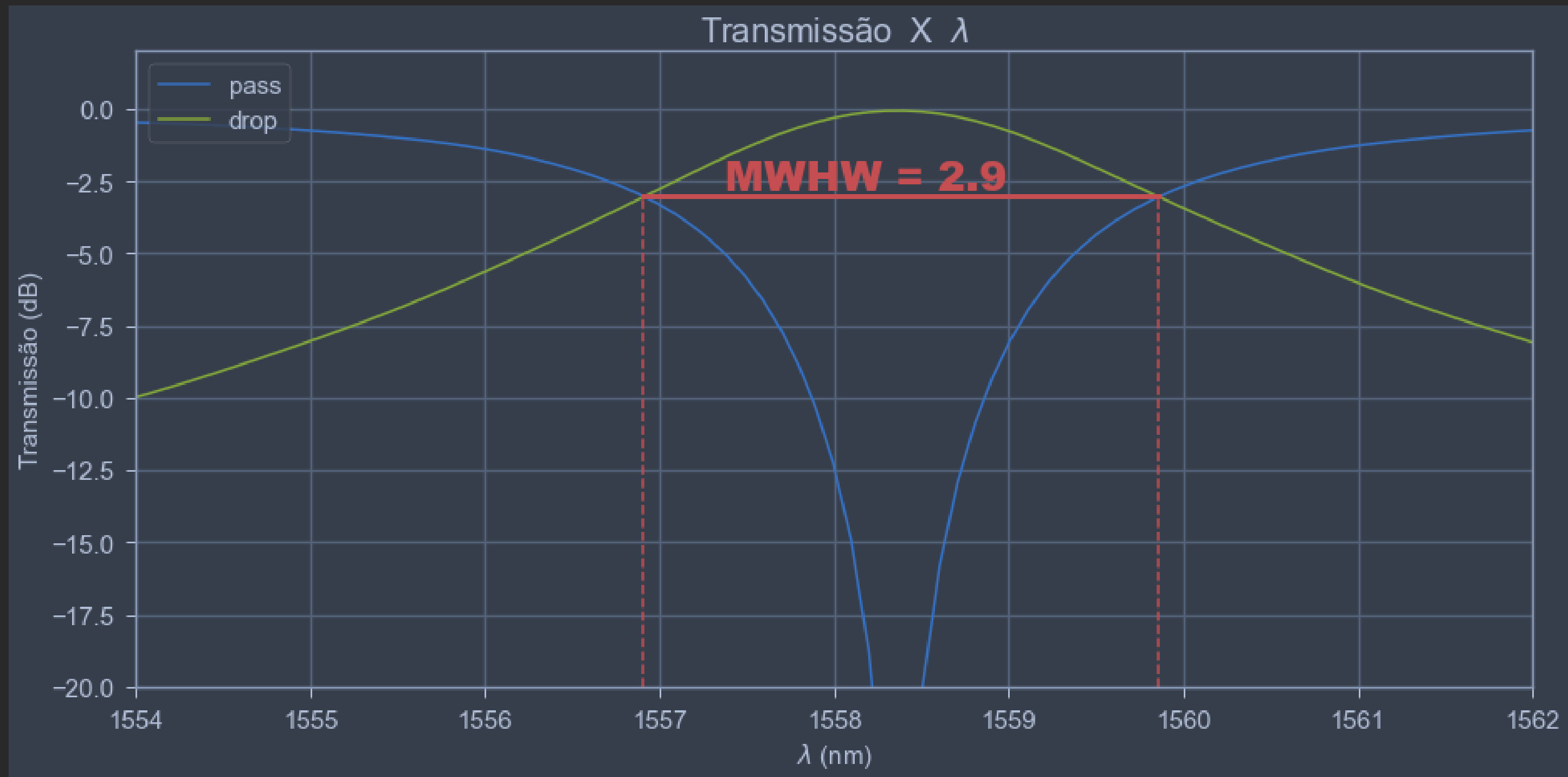
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



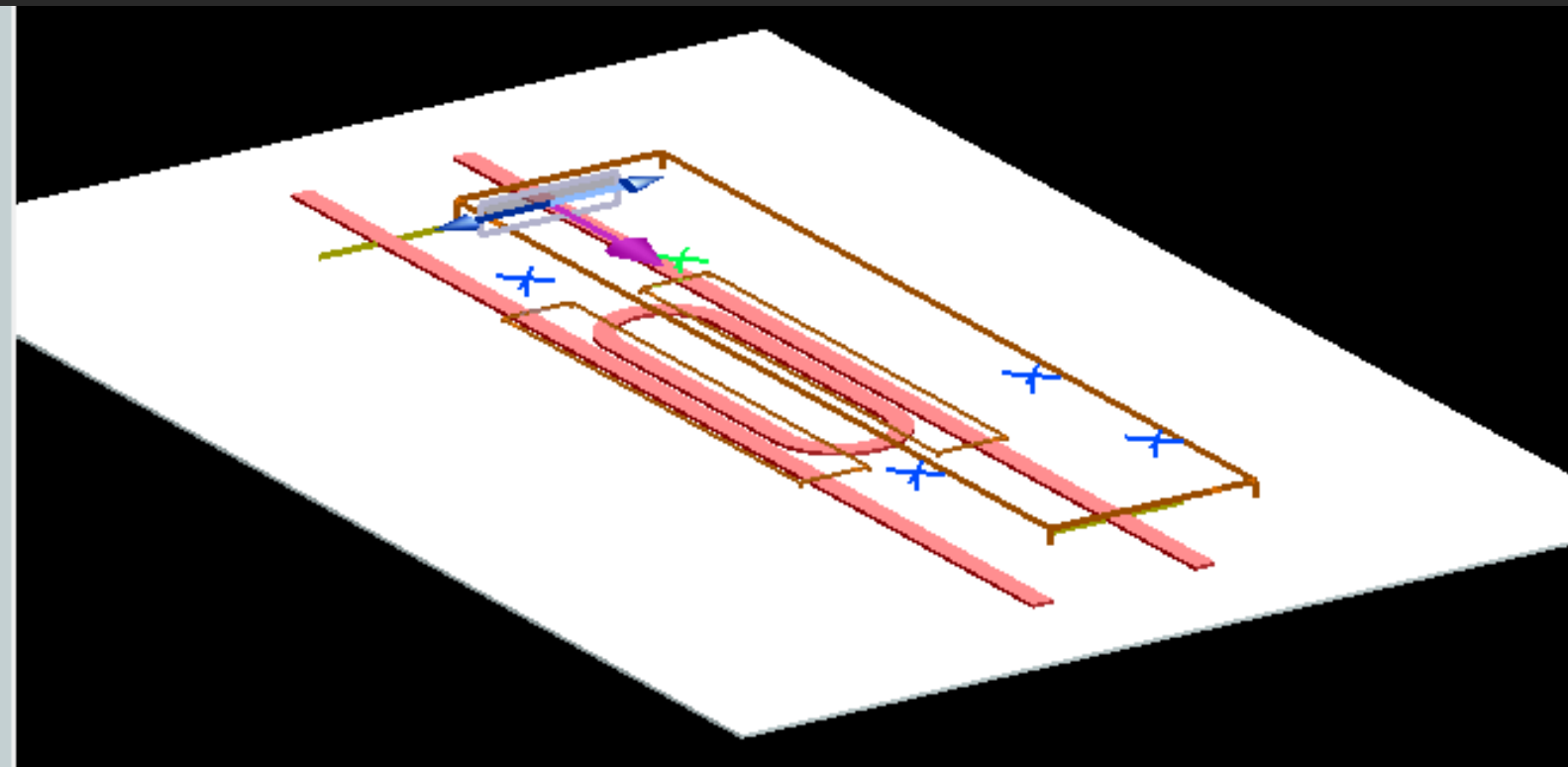
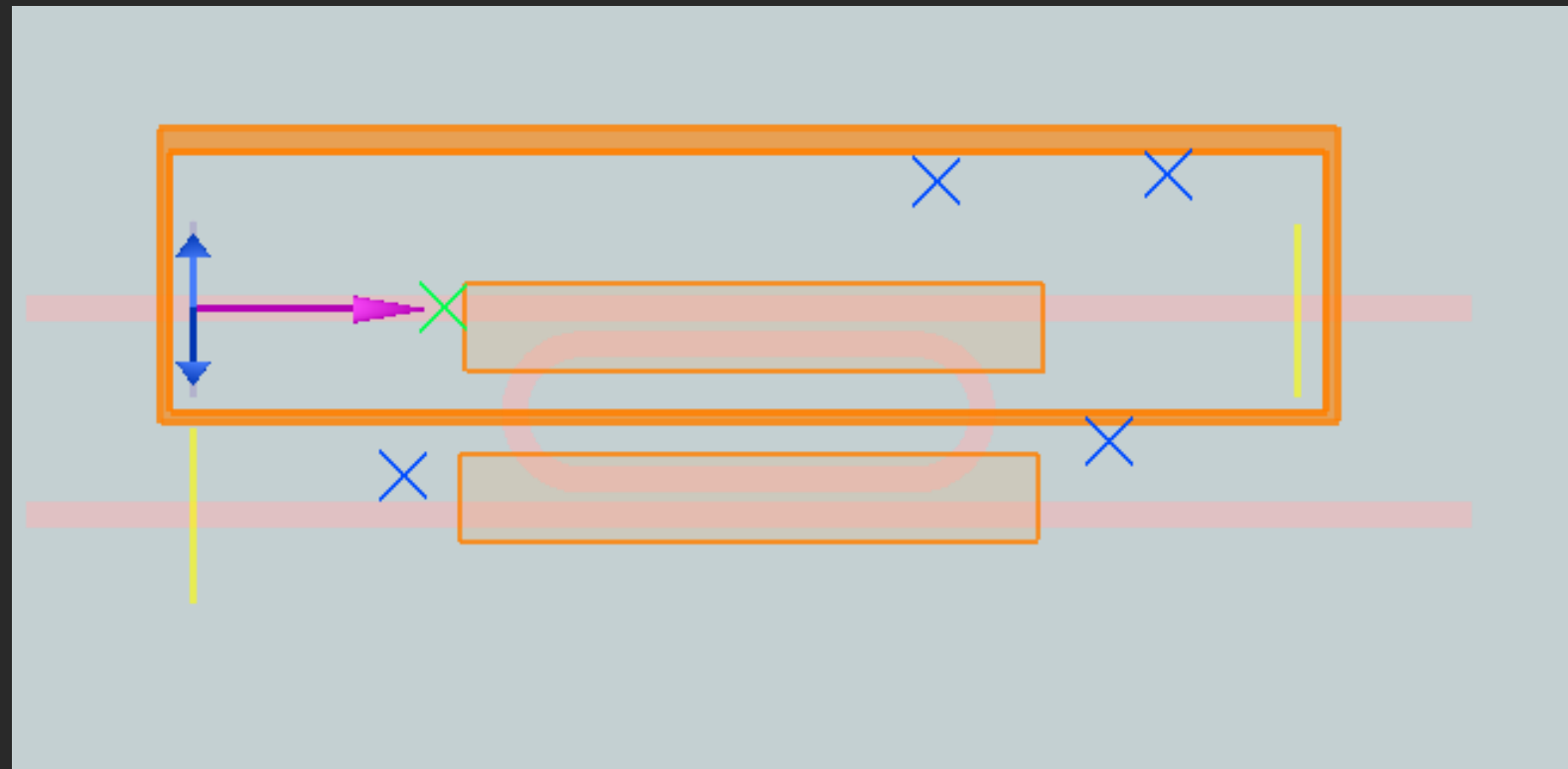
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



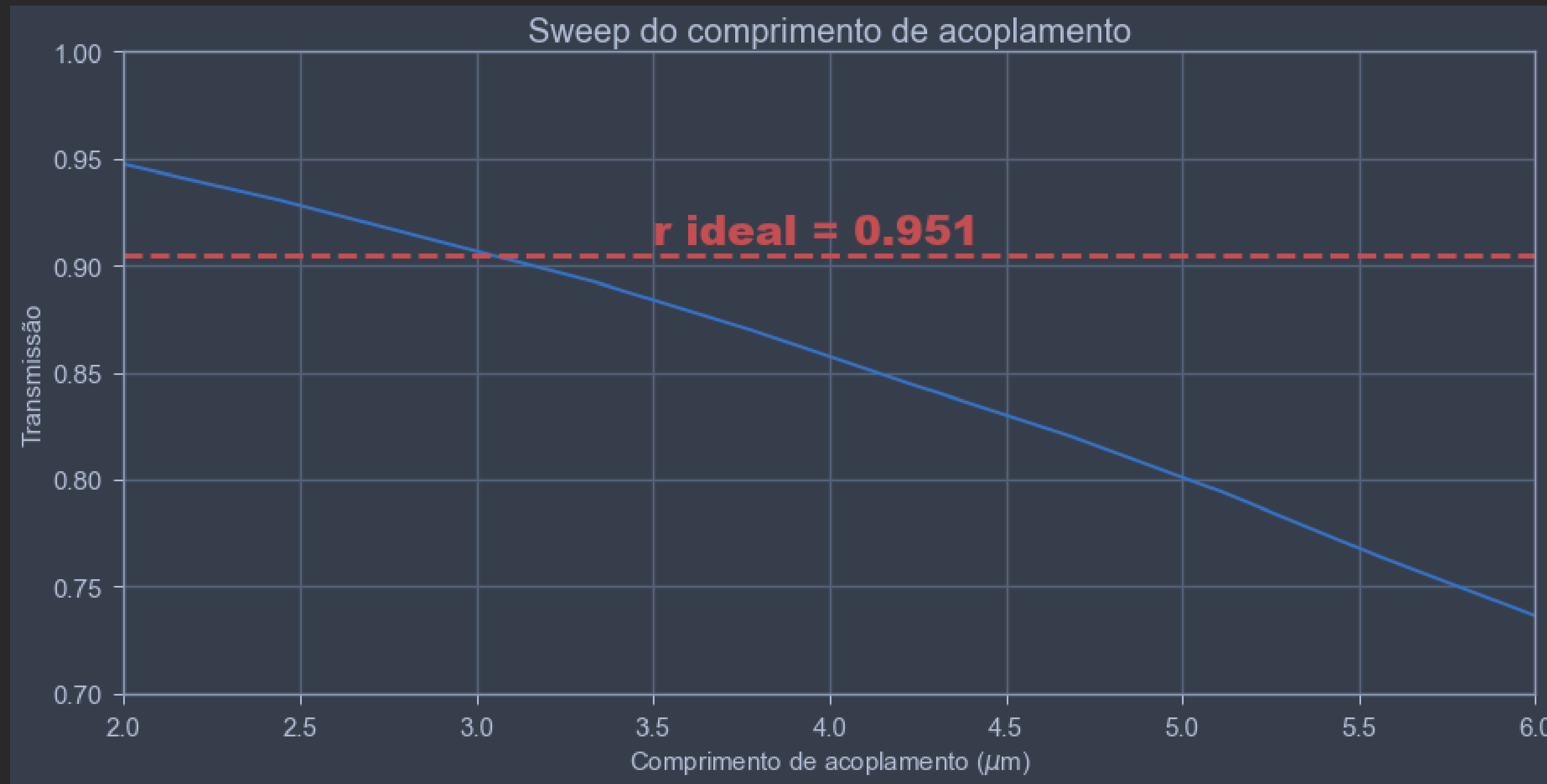
DESIGN DE UM ANEL DE RESSONÂNCIA

Sweep comprimento de acoplamento



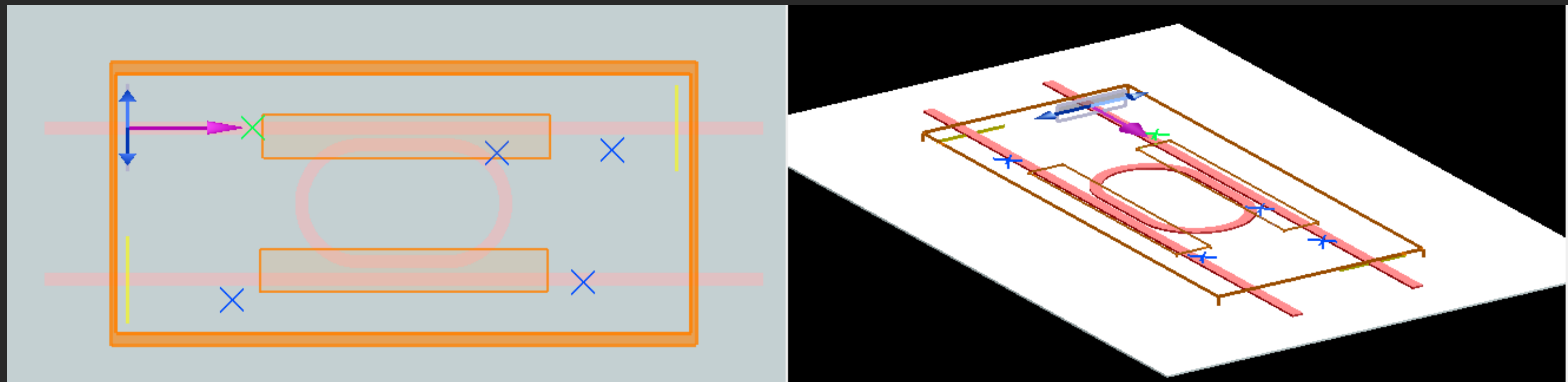
DESIGN DE UM ANEL DE RESSONÂNCIA

Sweep comprimento de acoplamento



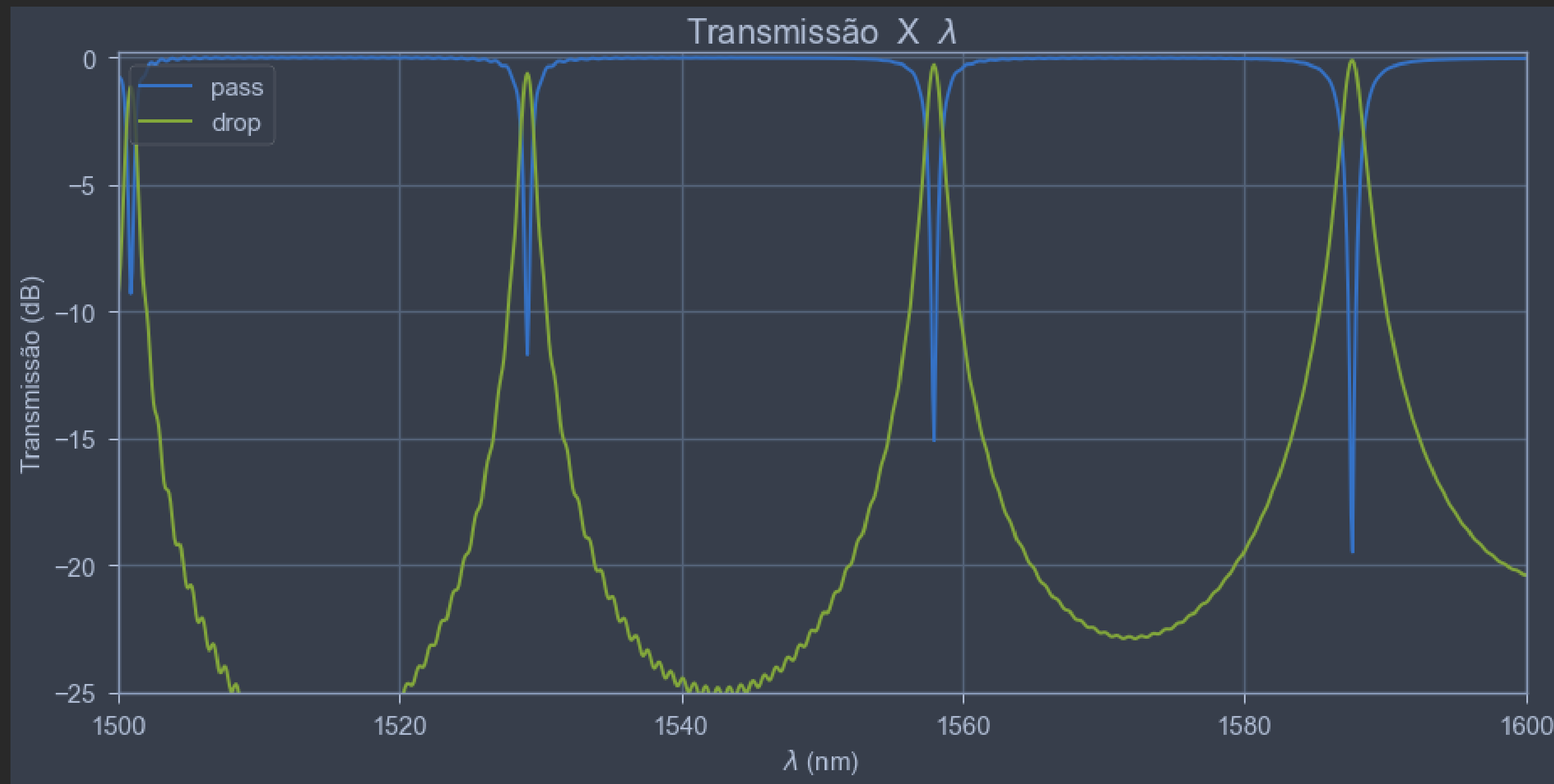
DESIGN DE UM ANEL DE RESSONÂNCIA

Usando $L_{\text{acoplamento}} = 3.0.5 \text{ um}$



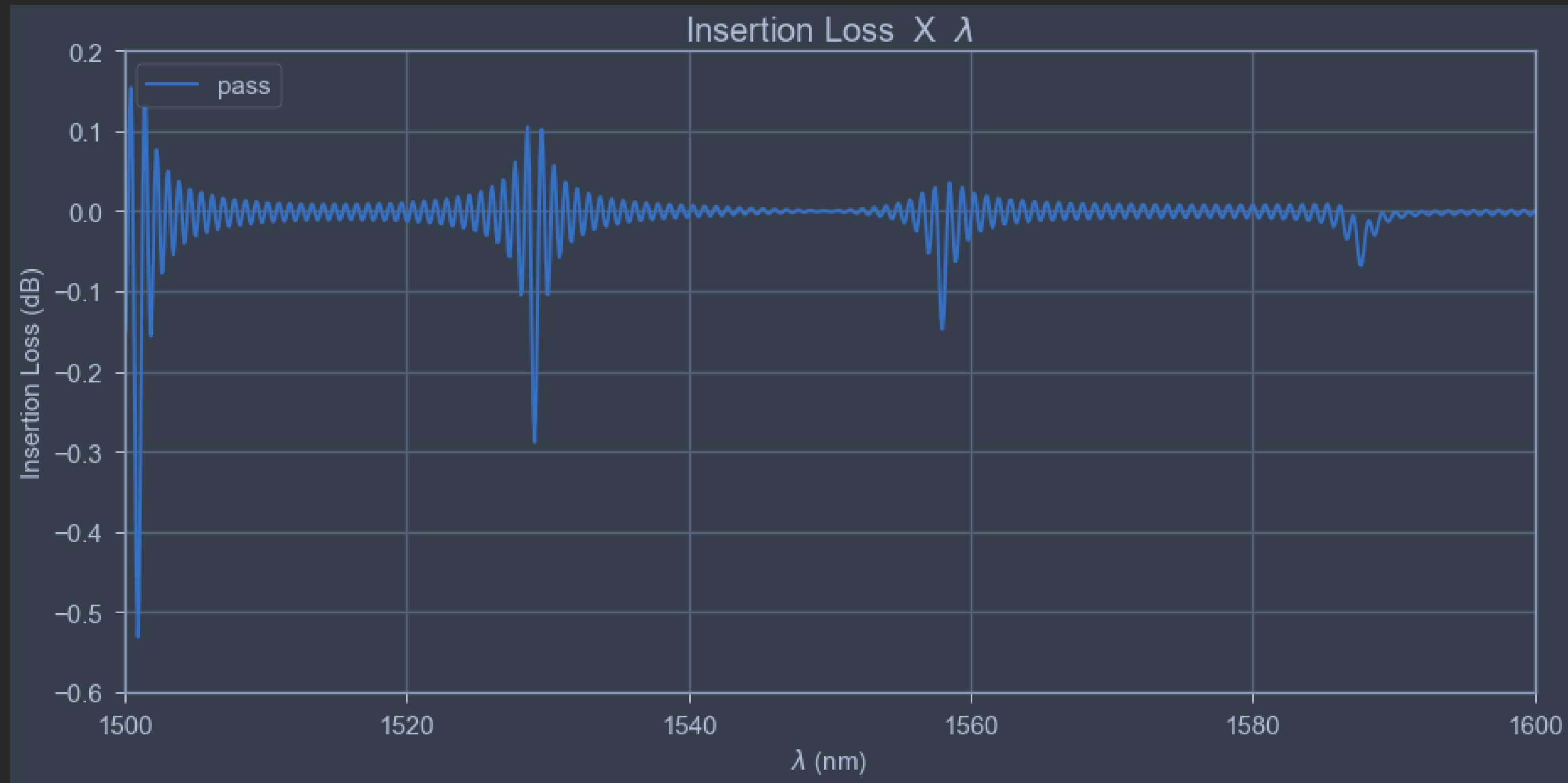
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



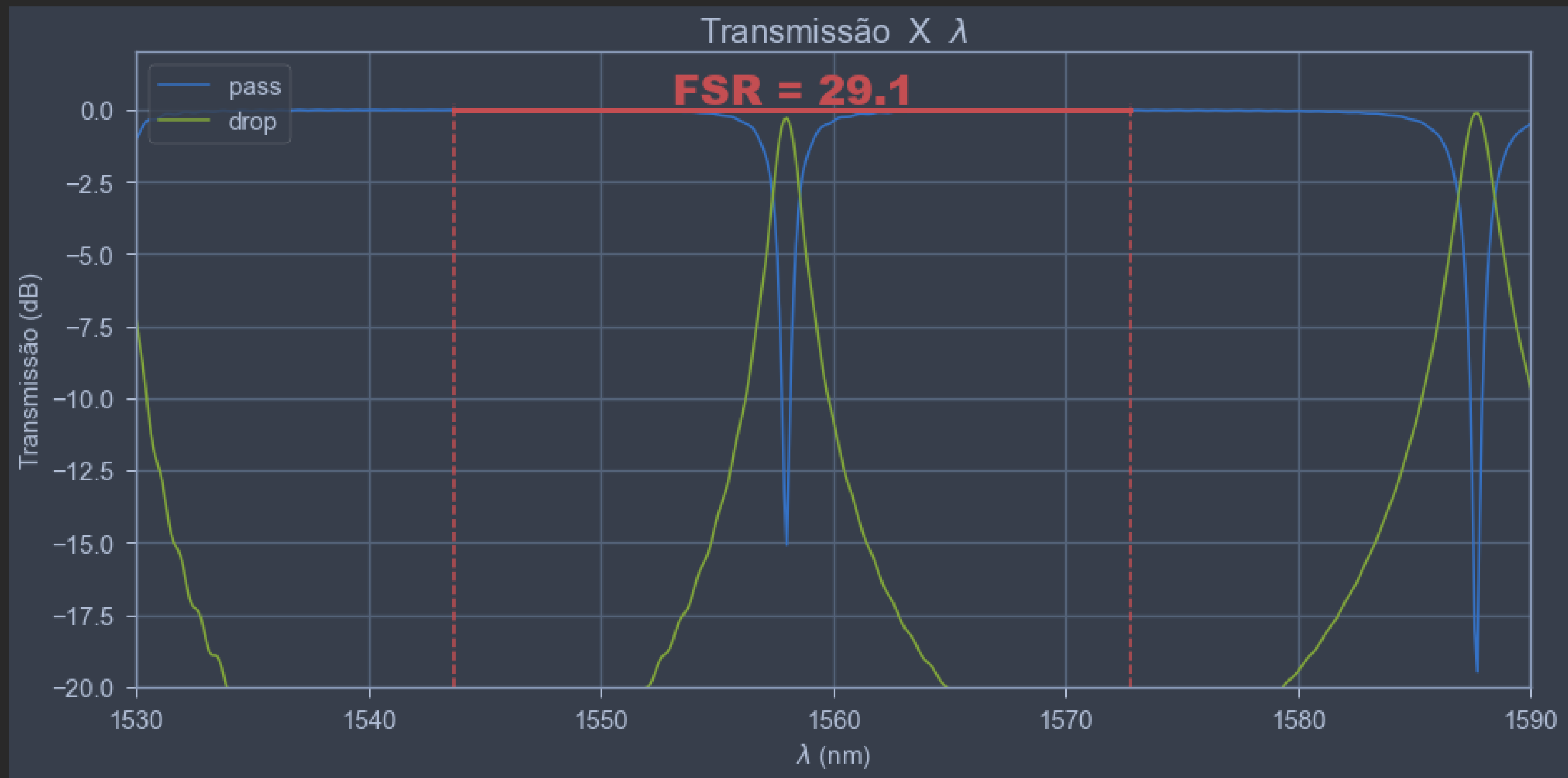
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



SEMANA 3

DESIGN ANEL BANDA C

DESIGN DE UM ANEL DE RESSONÂNCIA

Especificações

Centrado na banda C

FSR = 0.8 nm

FWHM = 0.2 nm

SOI in SiO₂

Guia: 0.45/0.22 μm

gap = 150 nm

Valores Teóricos

Comprimento total = 650.82 μm

Comprimento de acoplamento = 15.13 μm

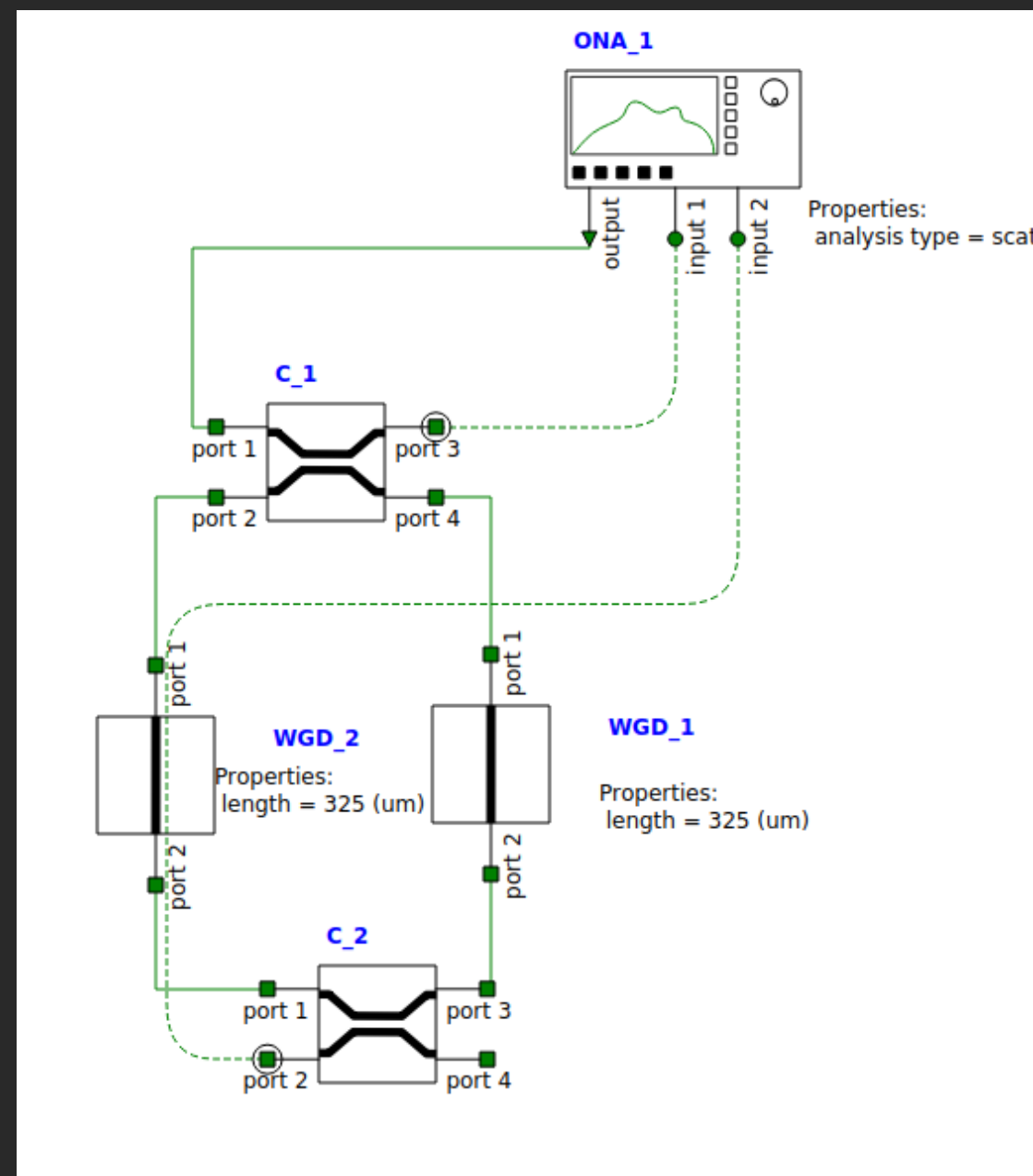
Raio = 98.76 μm

Q factor = 7749

Finesse = 4

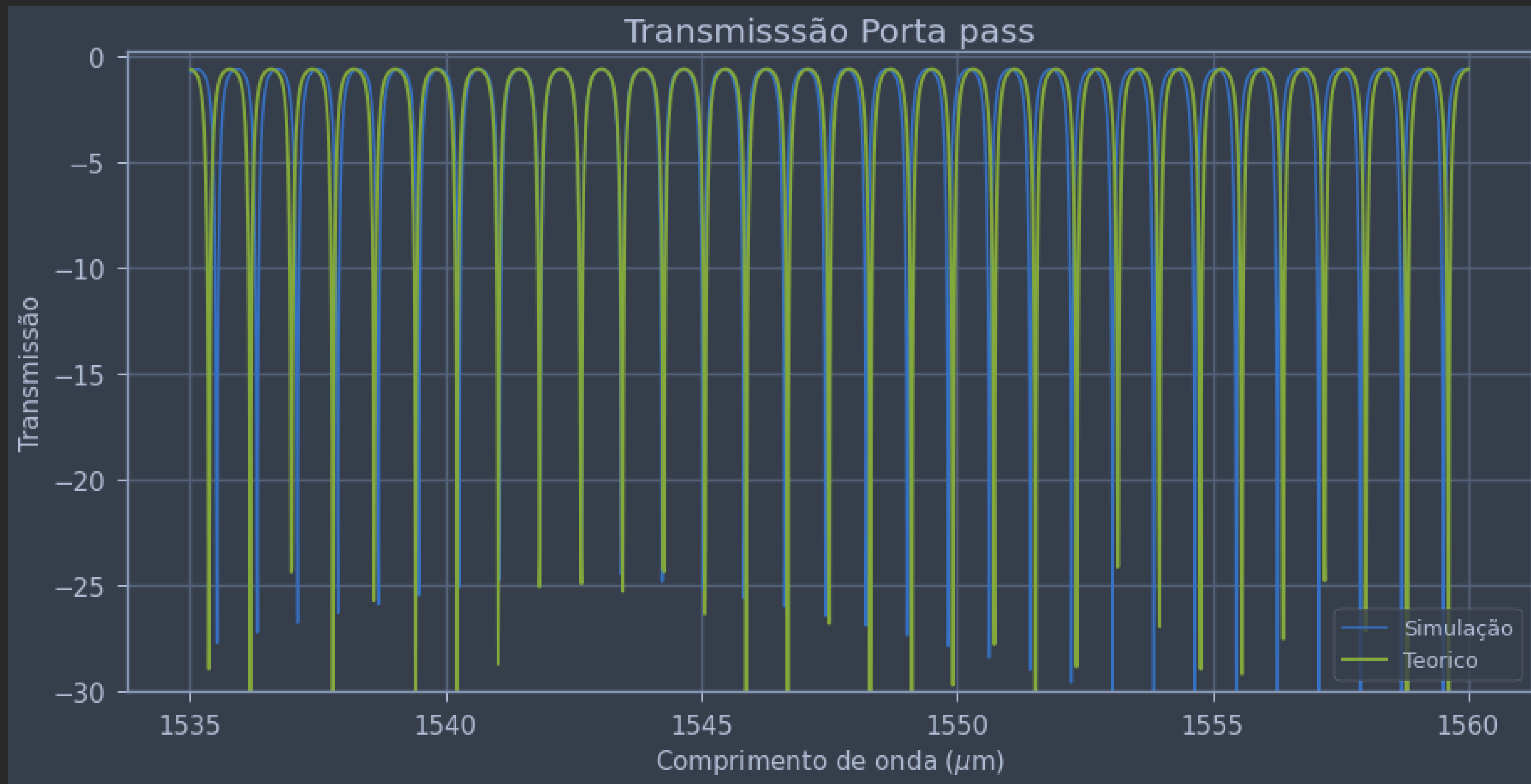
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação no Interconnect



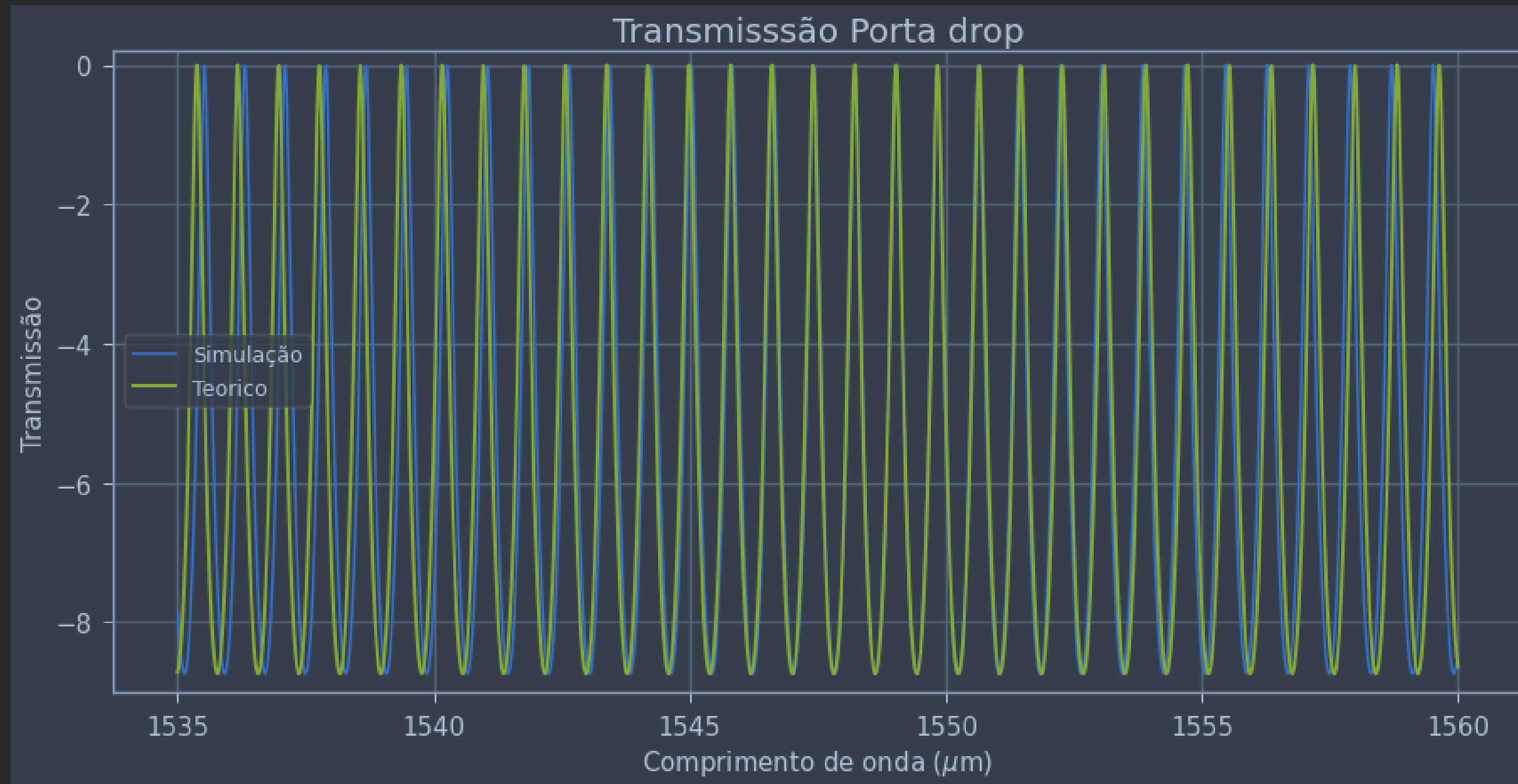
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



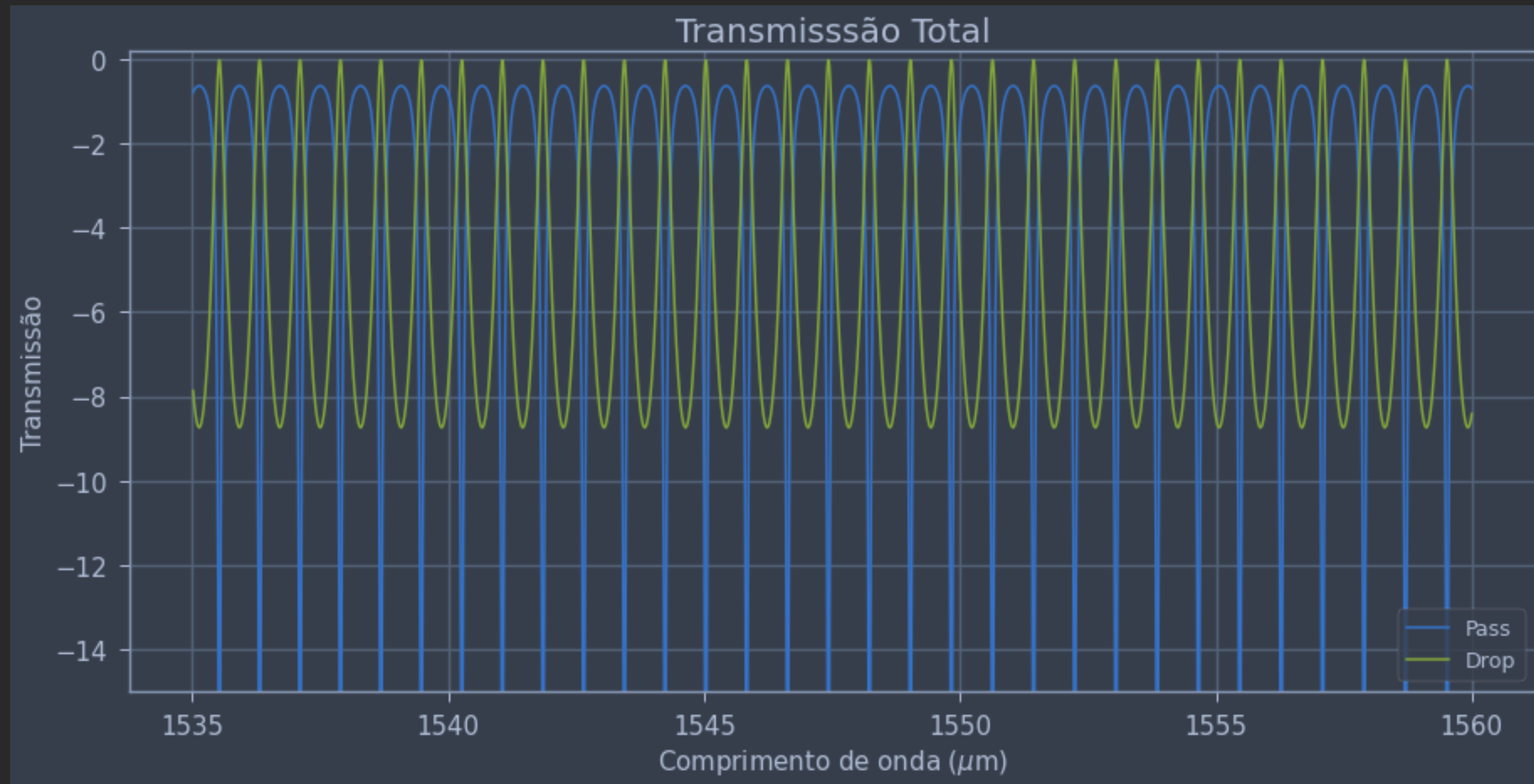
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



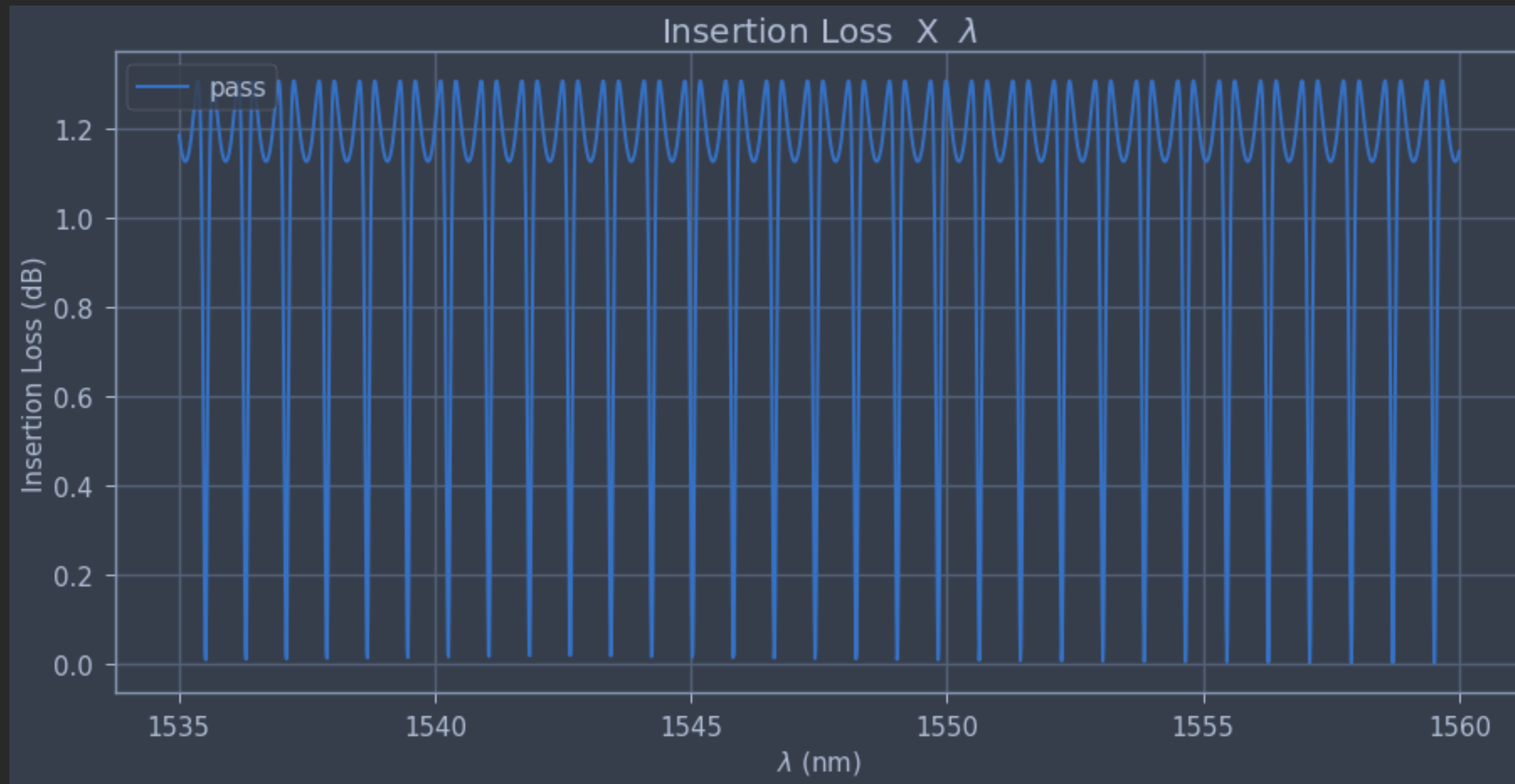
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



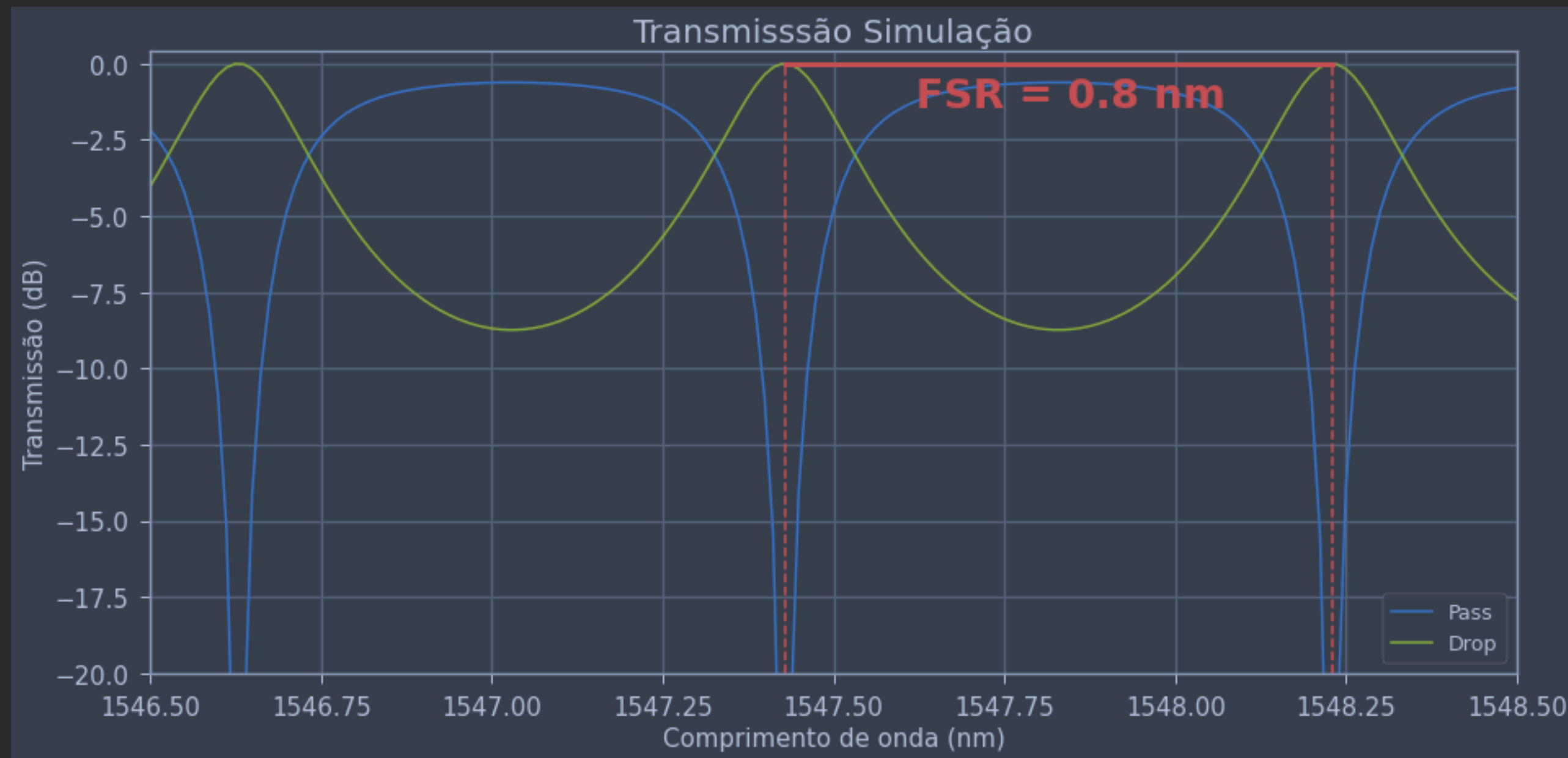
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



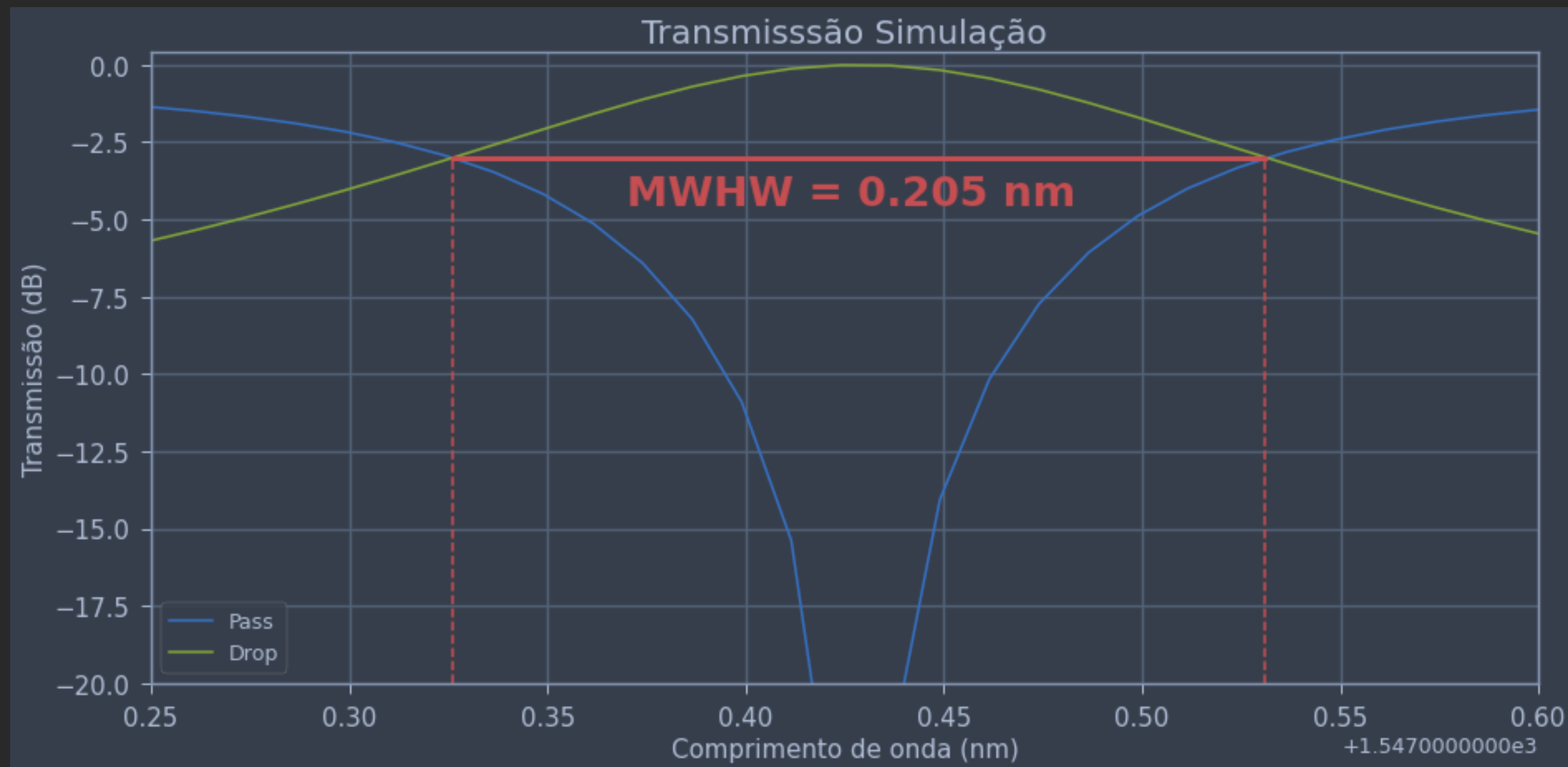
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



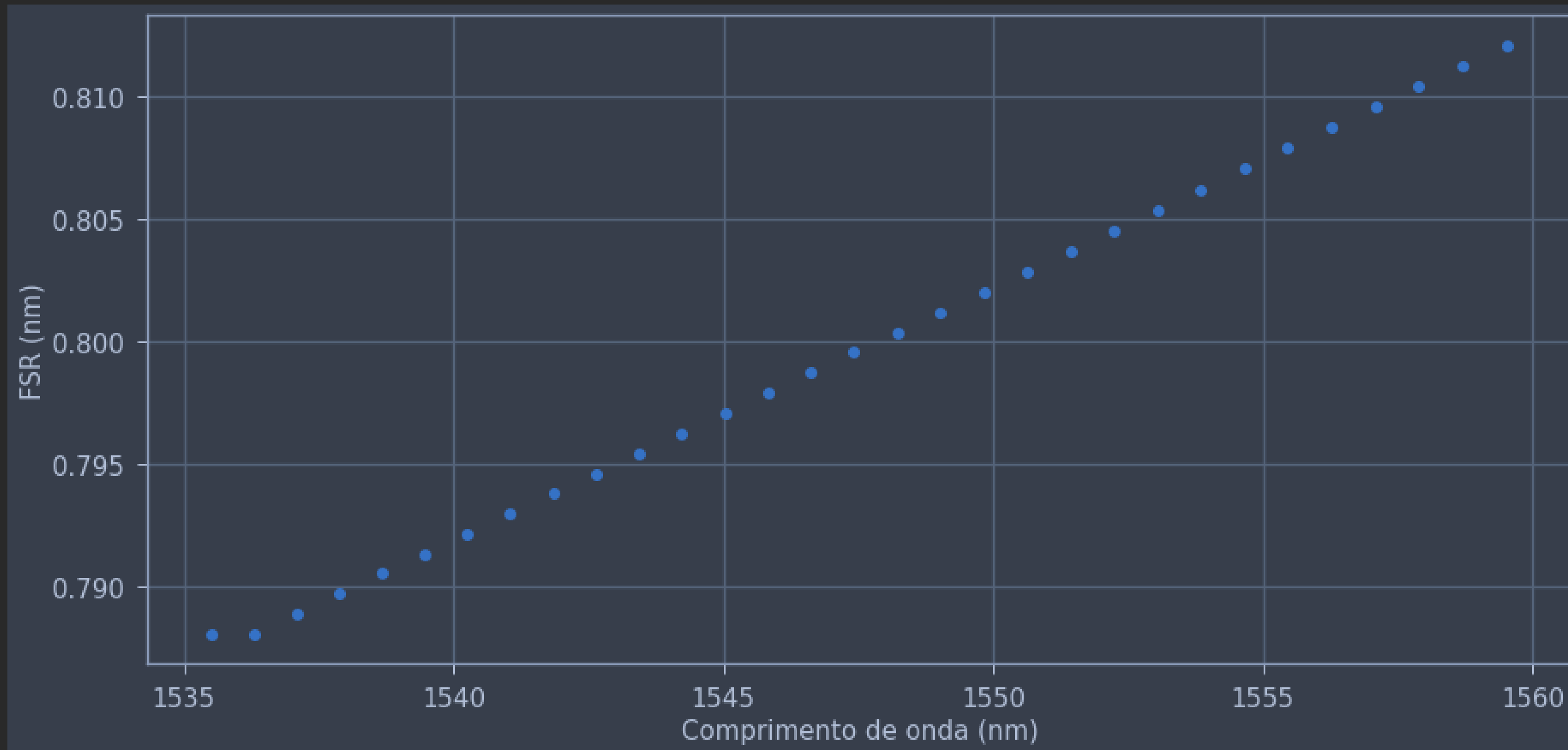
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



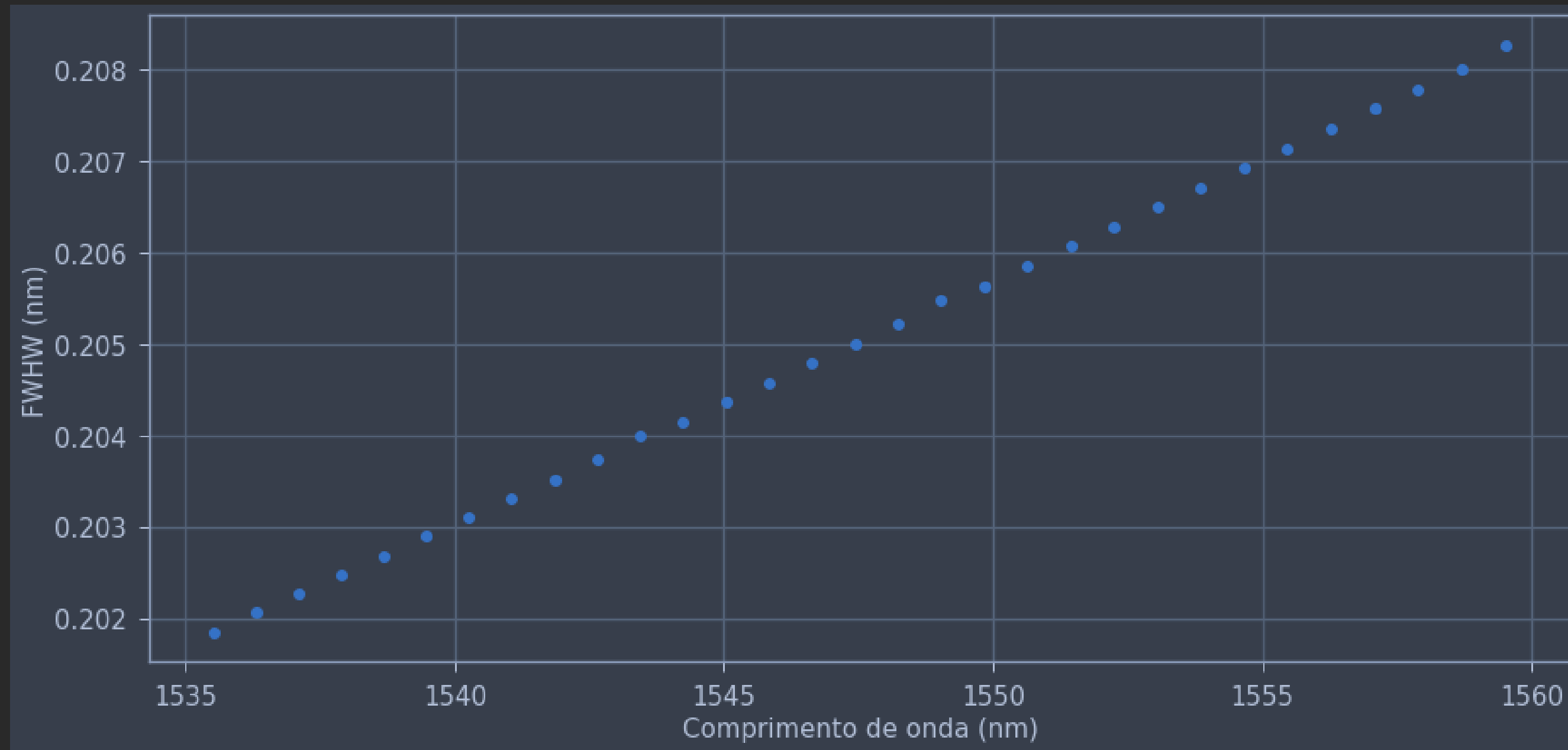
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



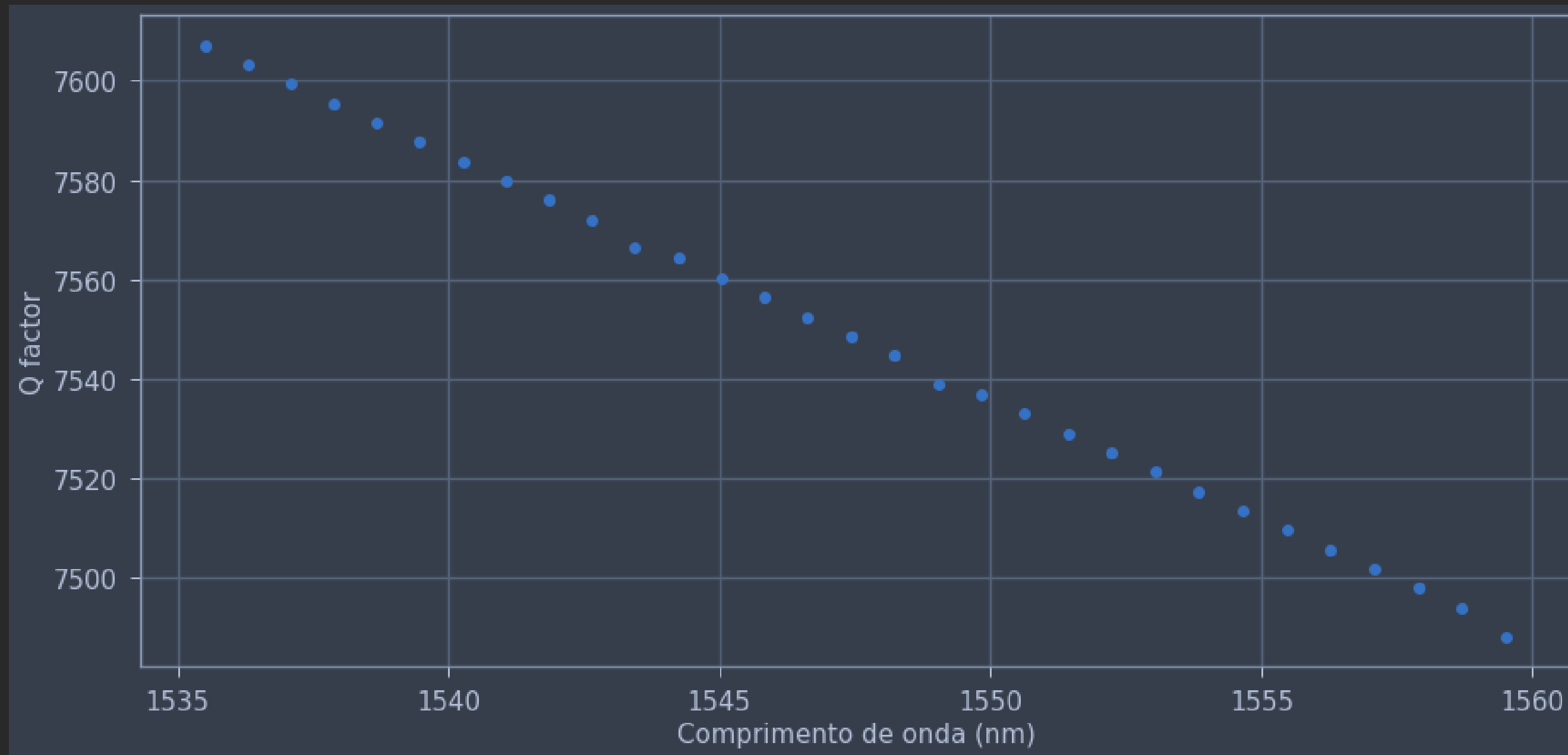
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



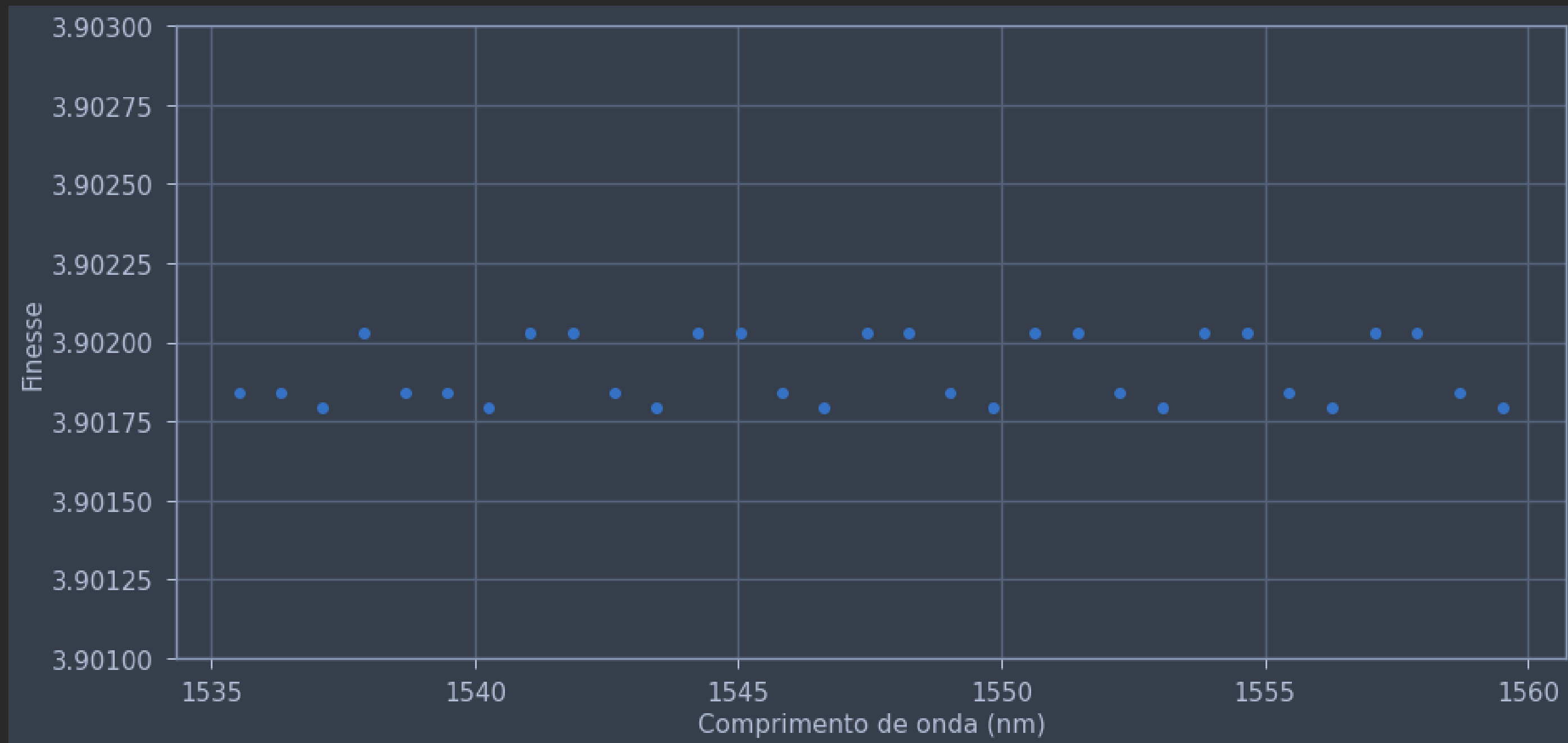
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

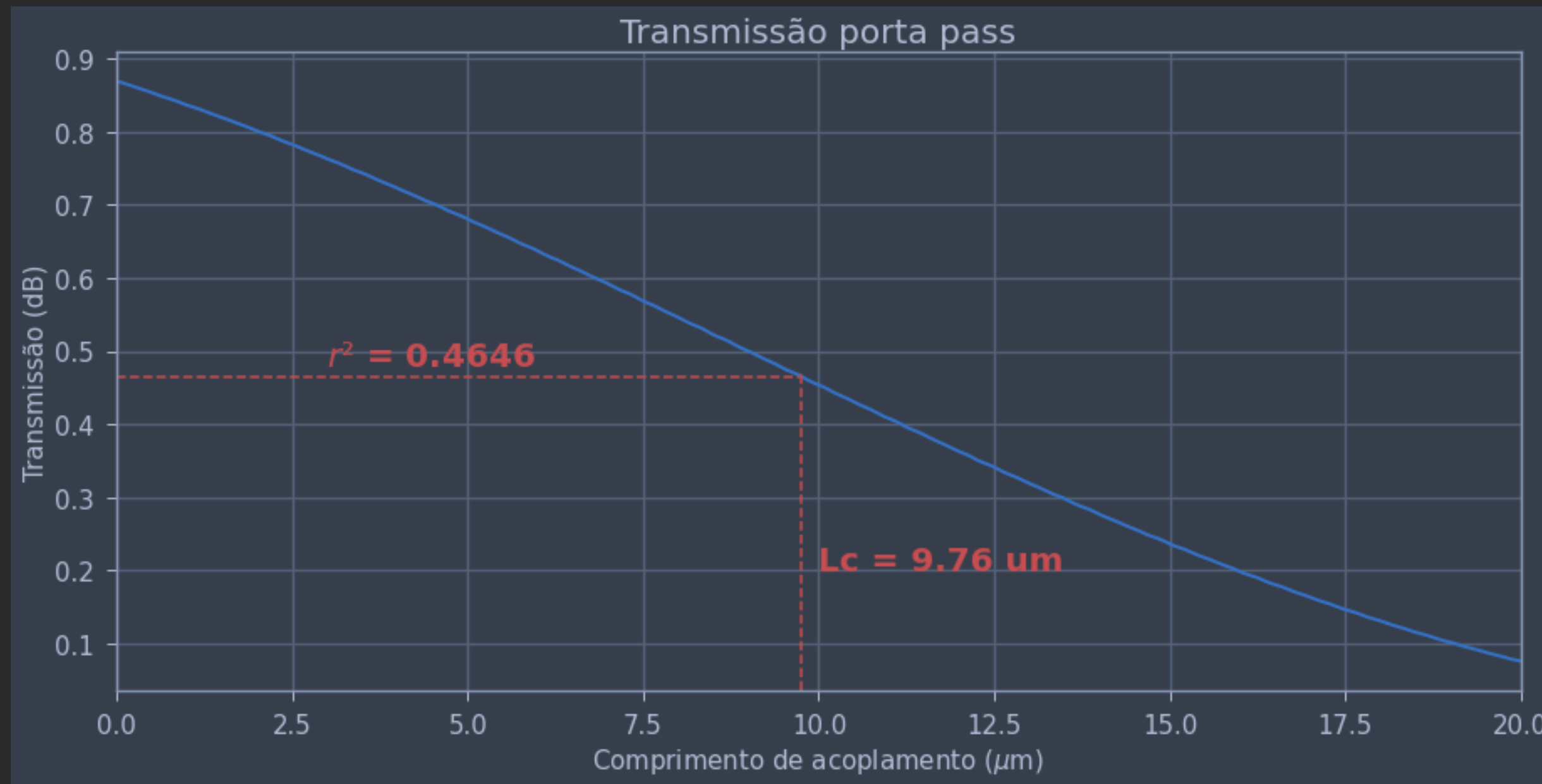
Analise do acoplamento

Solver usado: EME



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



SEMANA 4

Simulações no FDTD

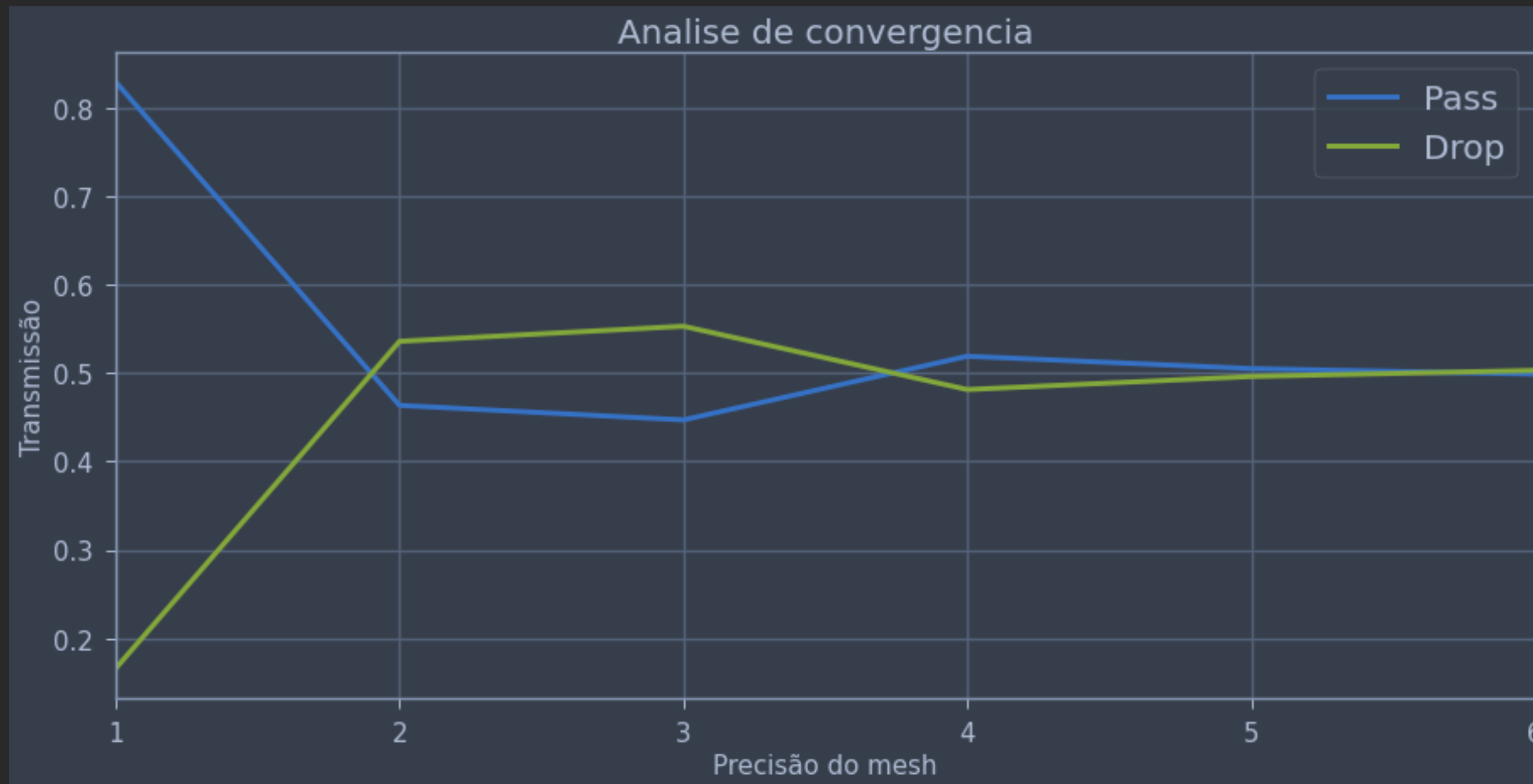
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação dos componentes



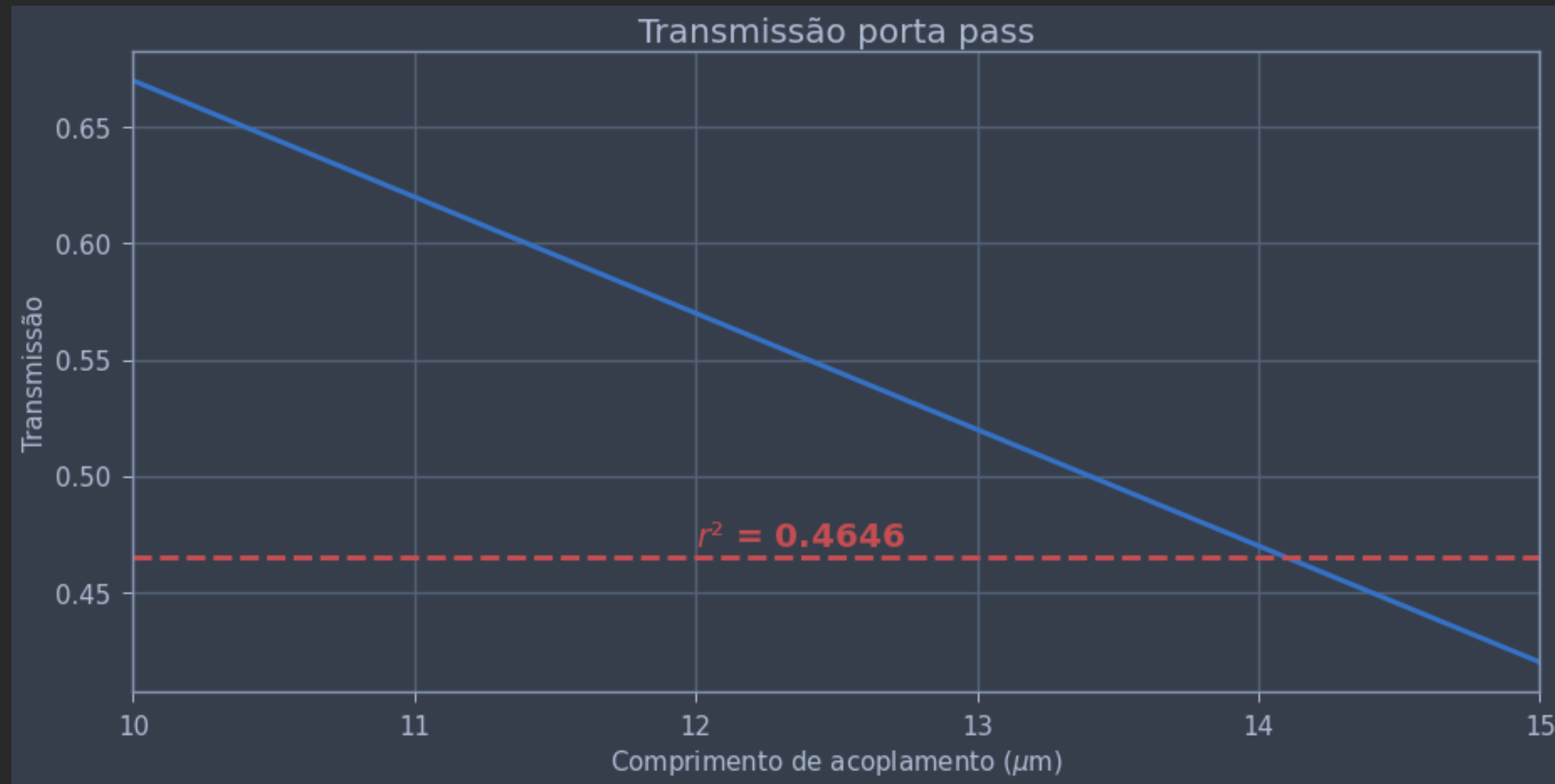
DESIGN DE UM ANEL DE RESSONÂNCIA

Analise de convergência



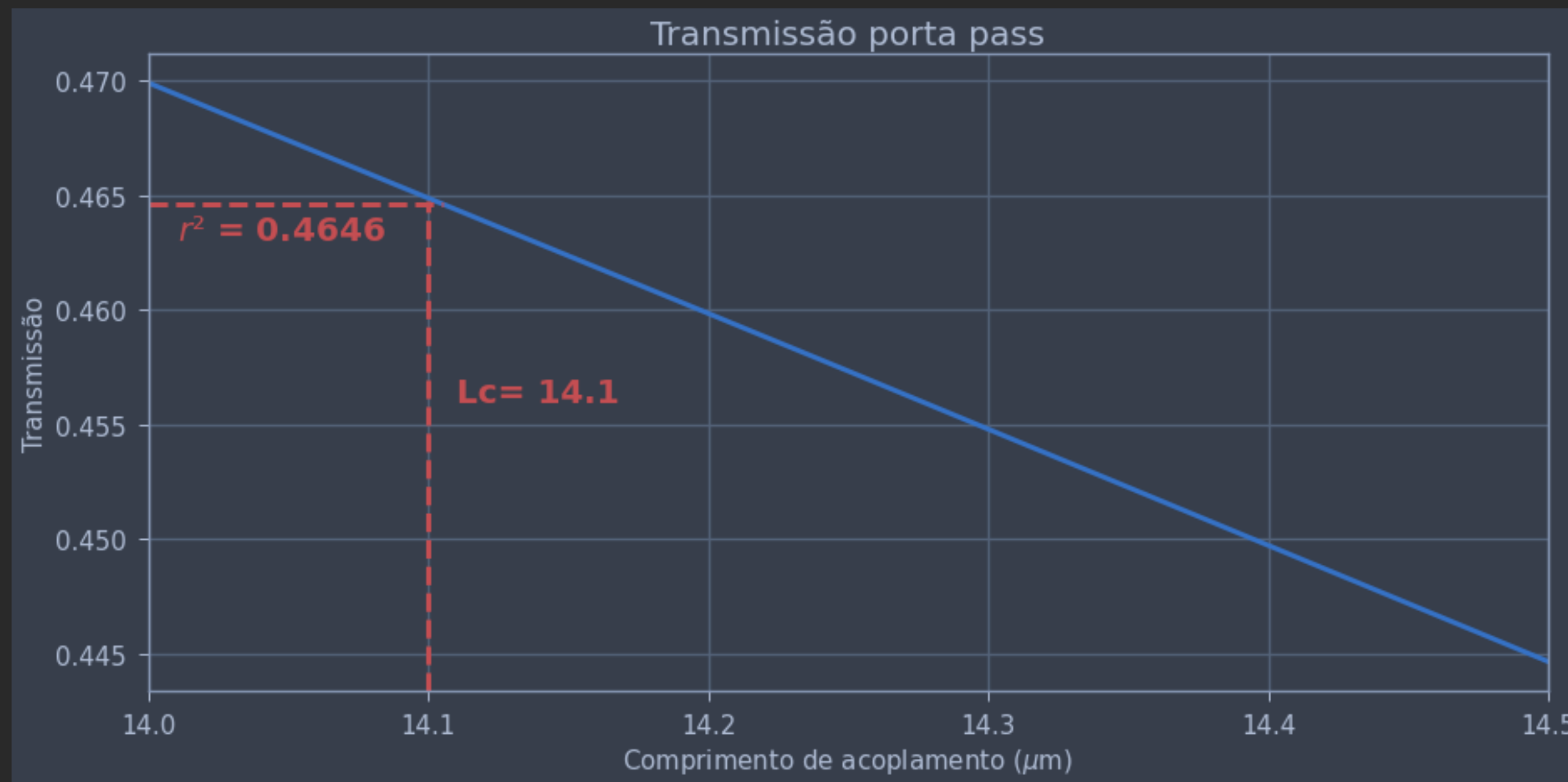
DESIGN DE UM ANEL DE RESSONÂNCIA

Analise do acoplamento



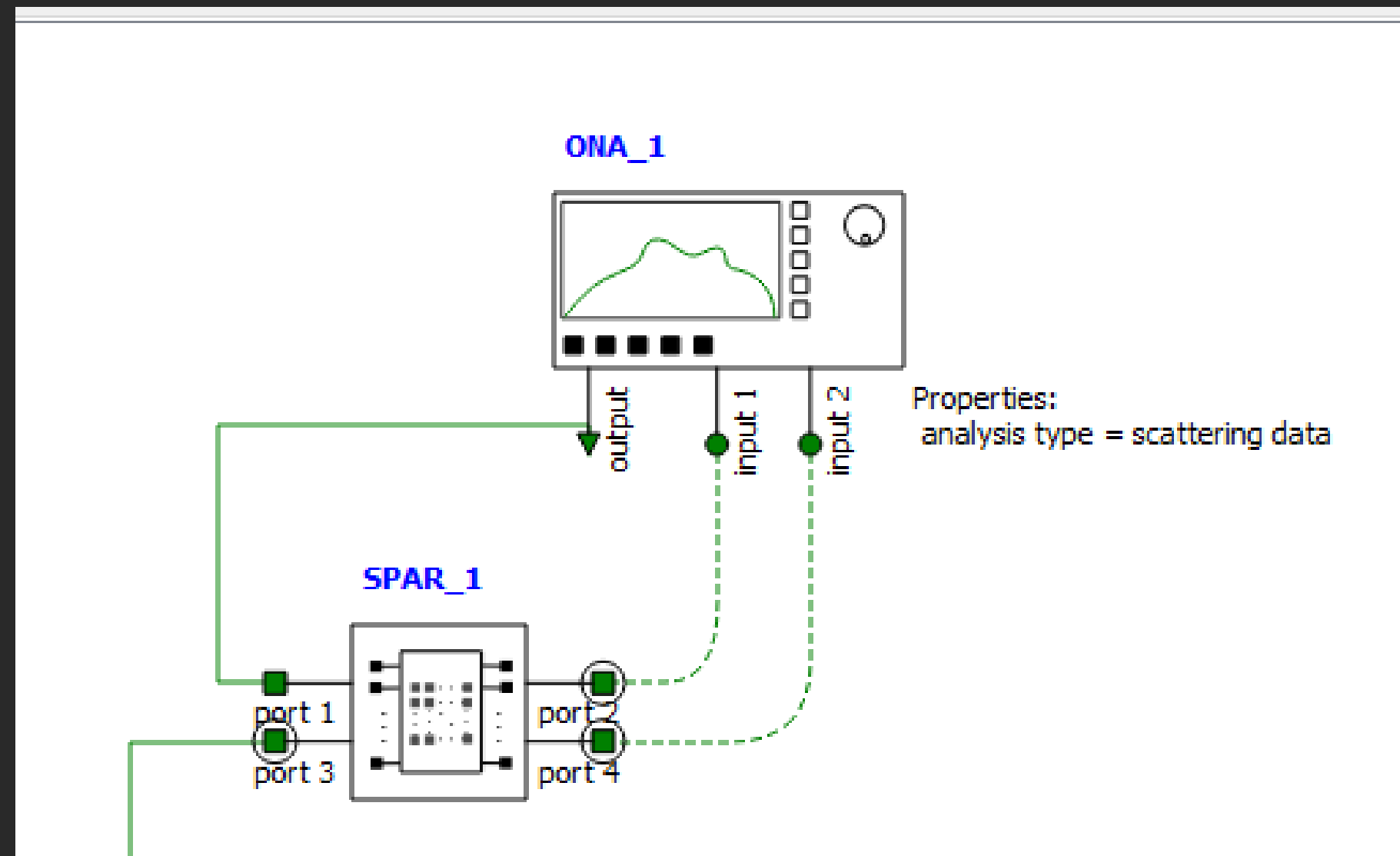
DESIGN DE UM ANEL DE RESSONÂNCIA

Analise do acoplamento



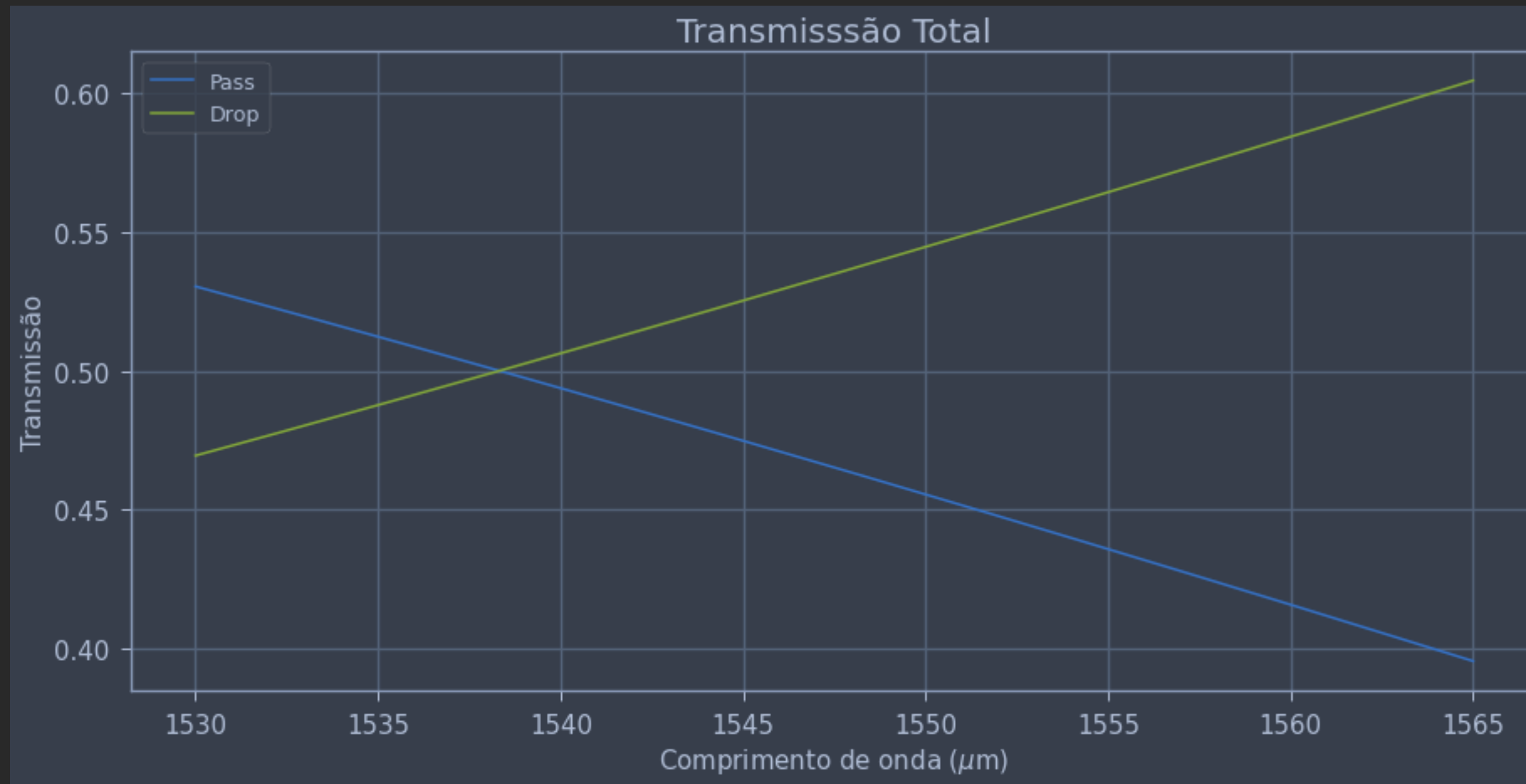
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



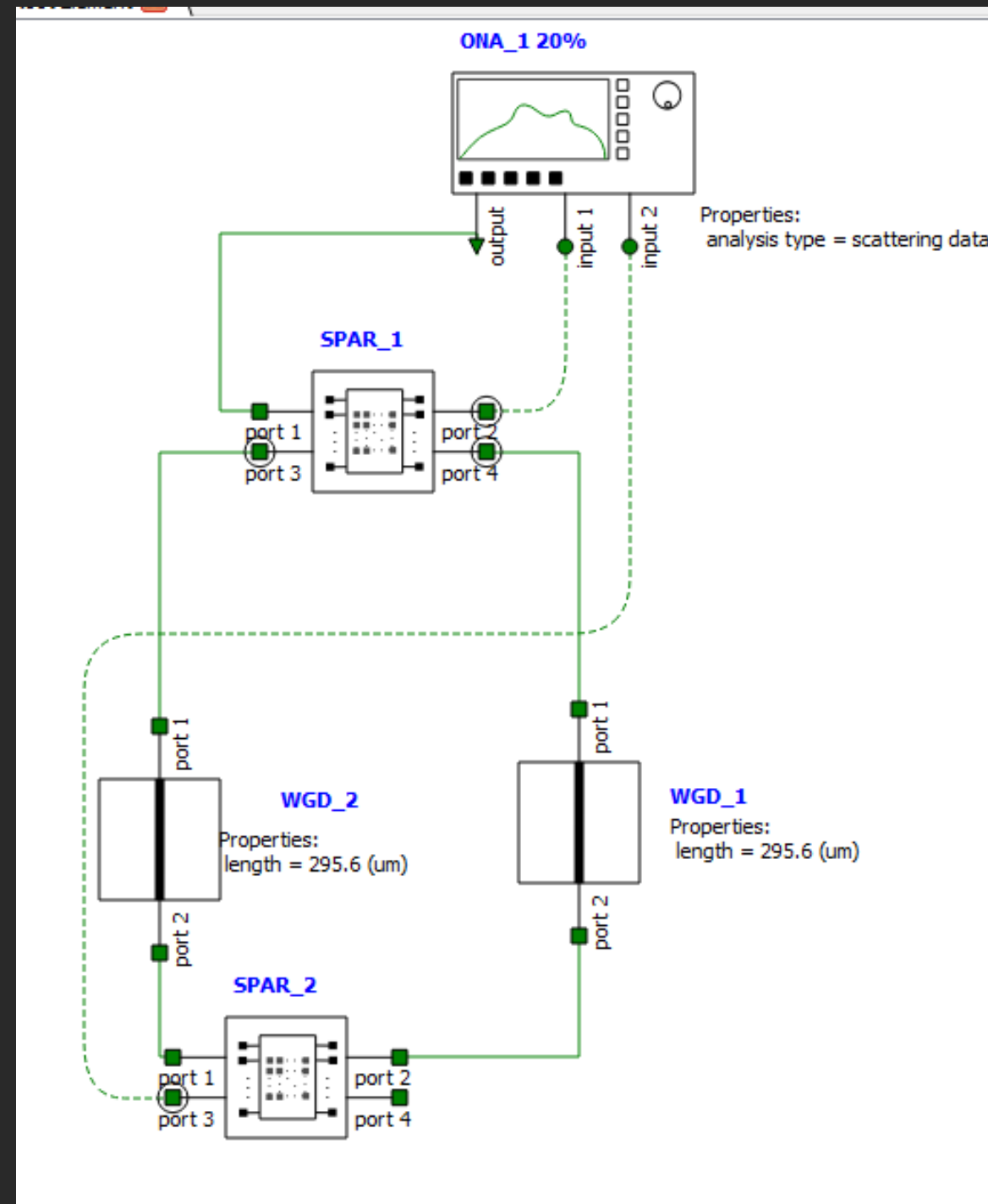
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



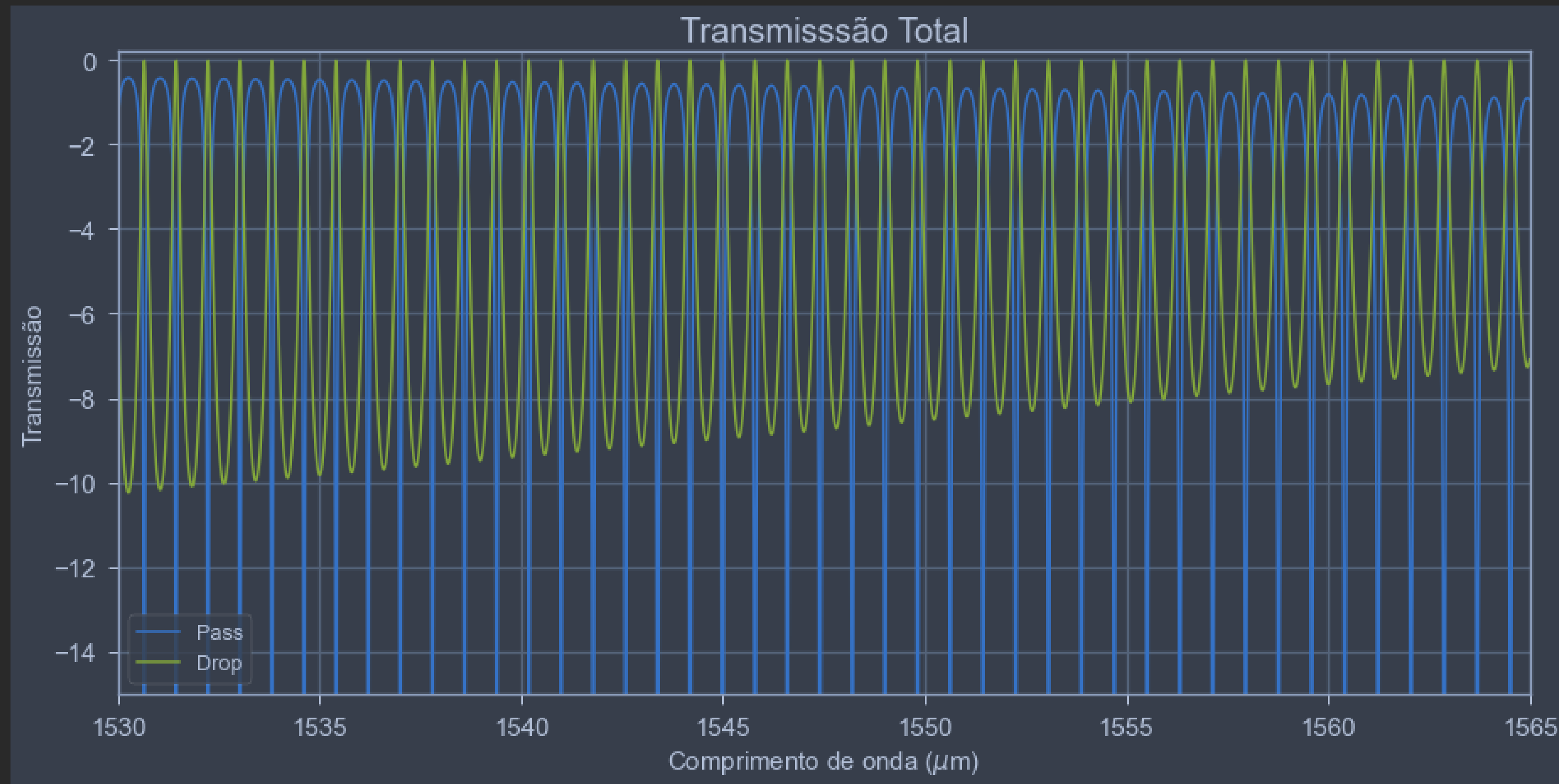
DESIGN DE UM ANEL DE RESSONÂNCIA

Circuito final



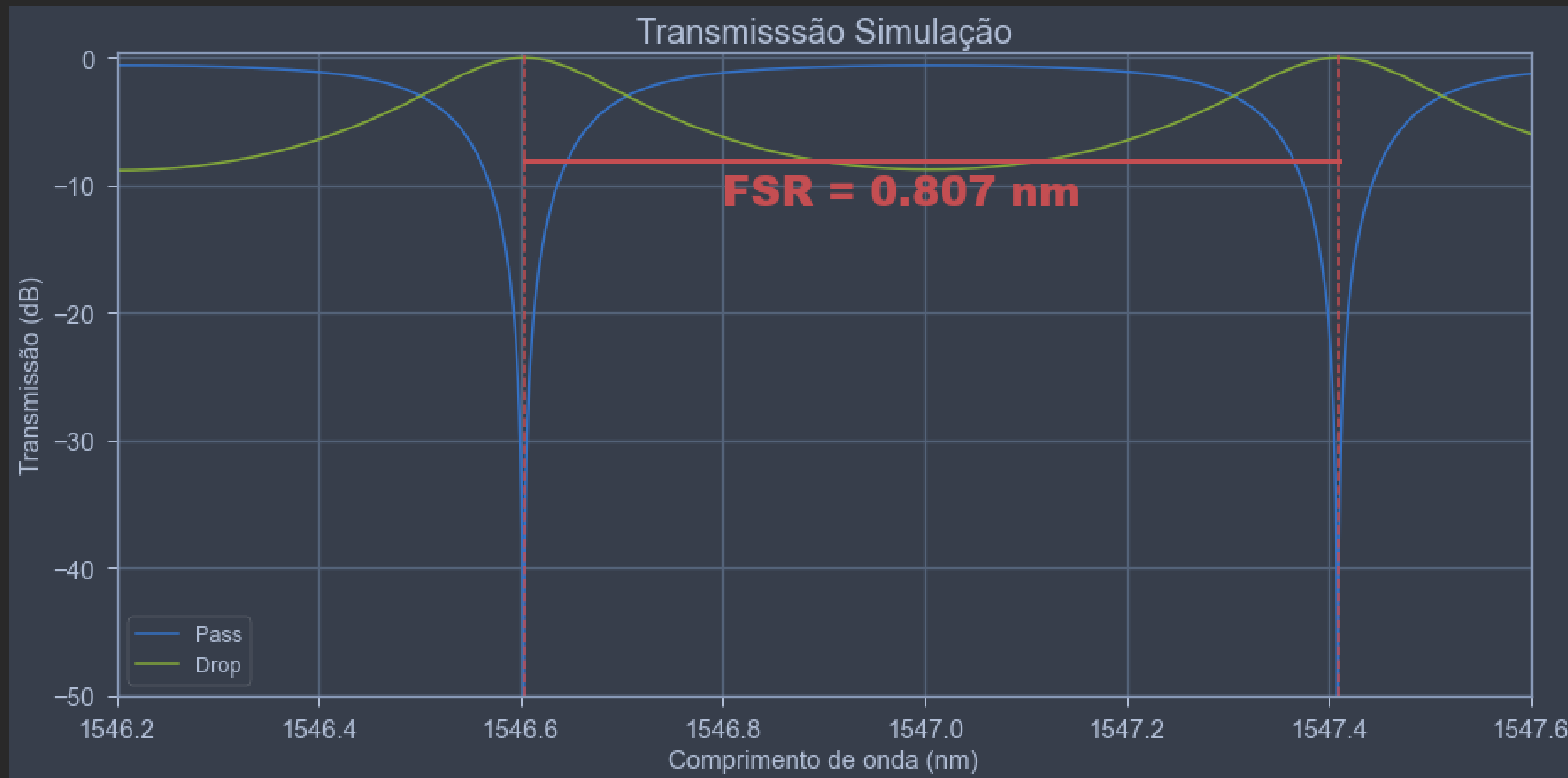
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



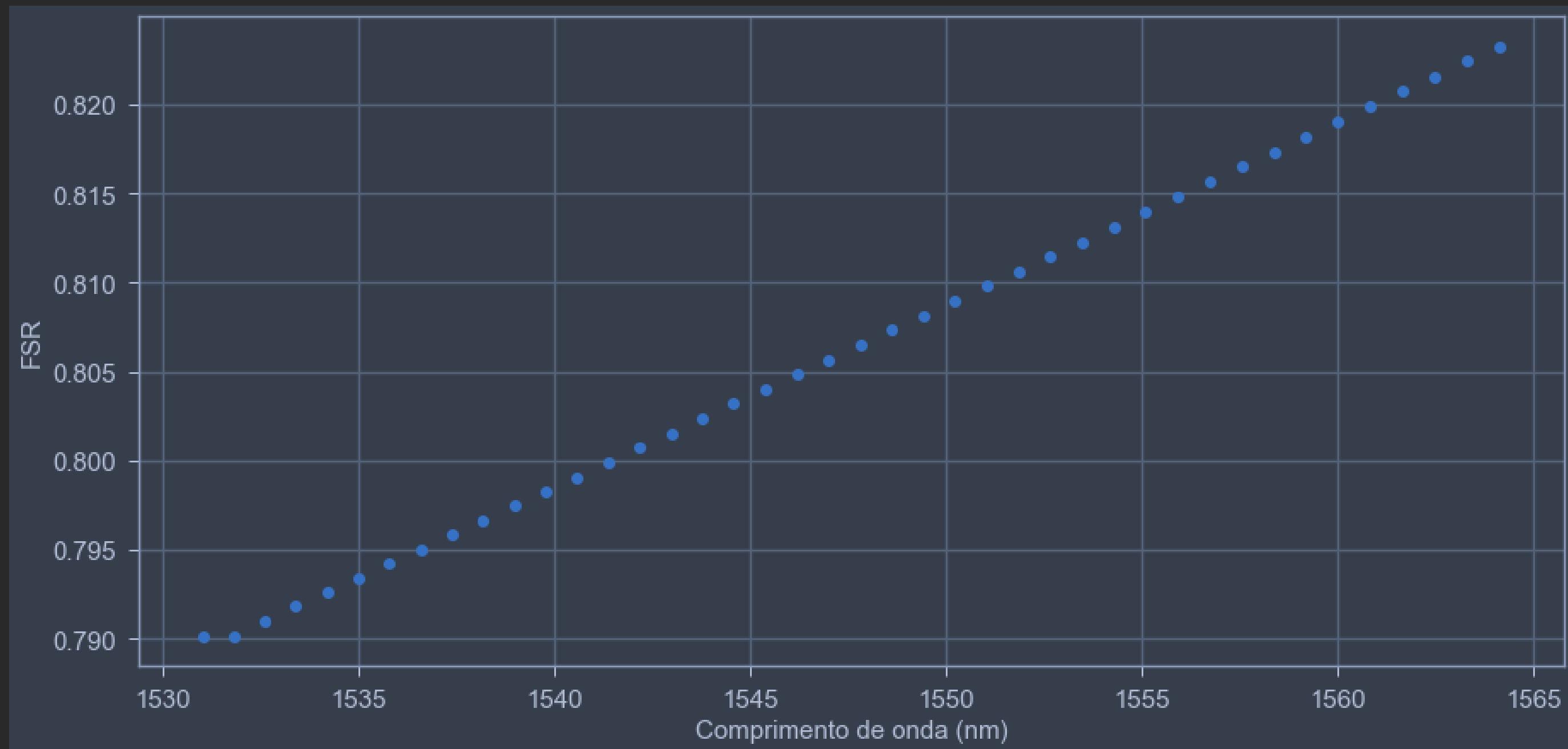
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



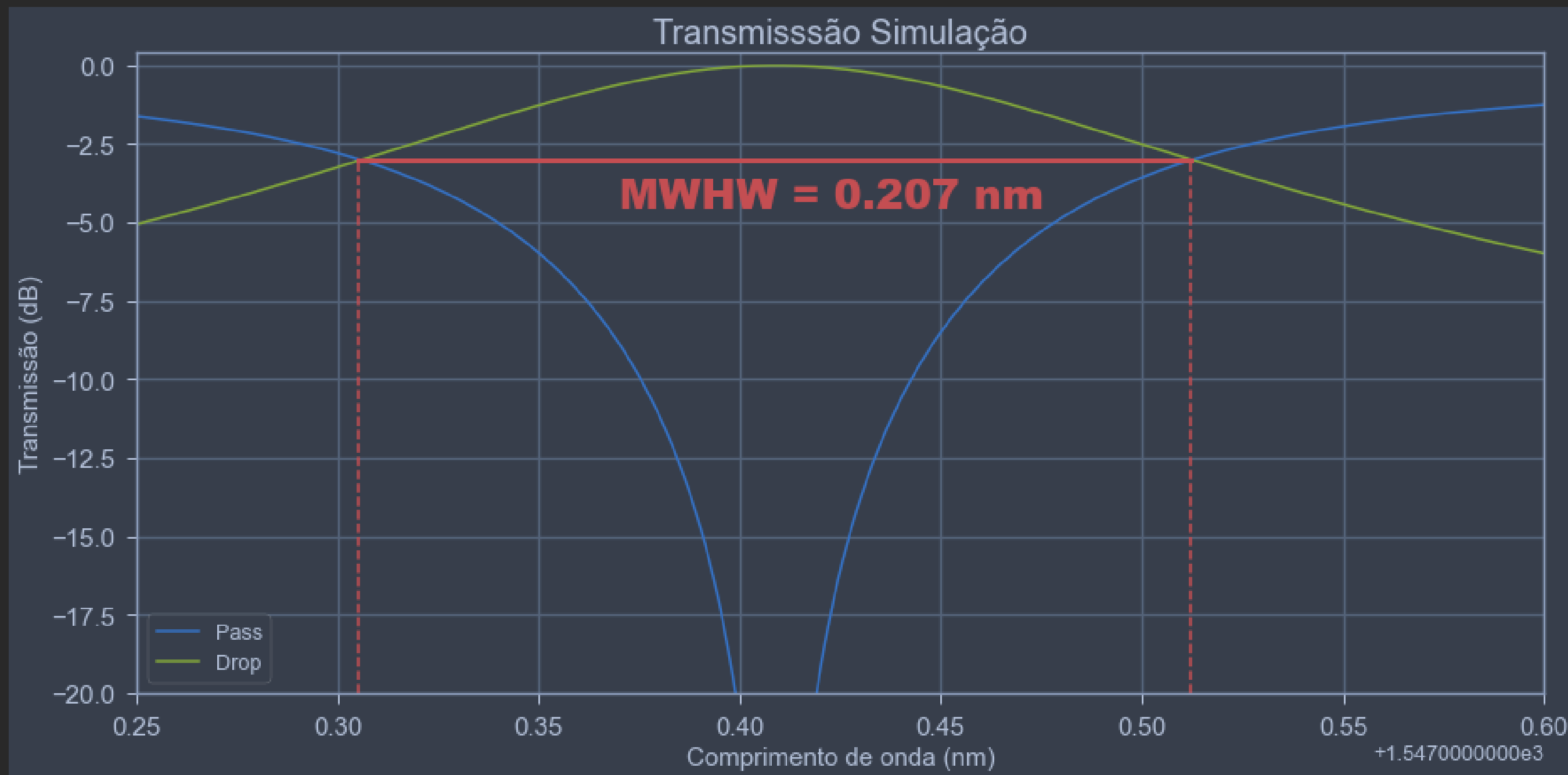
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



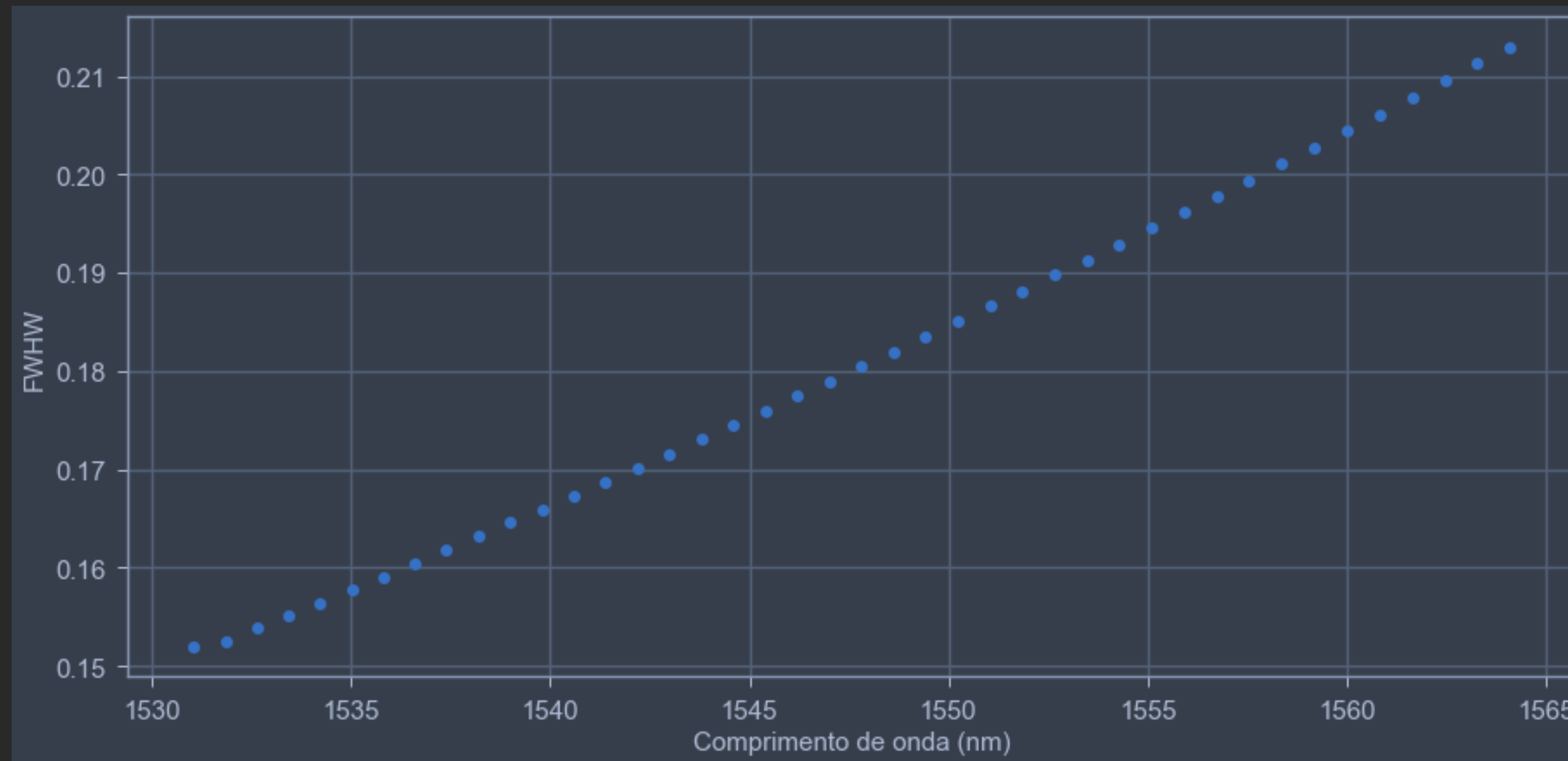
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



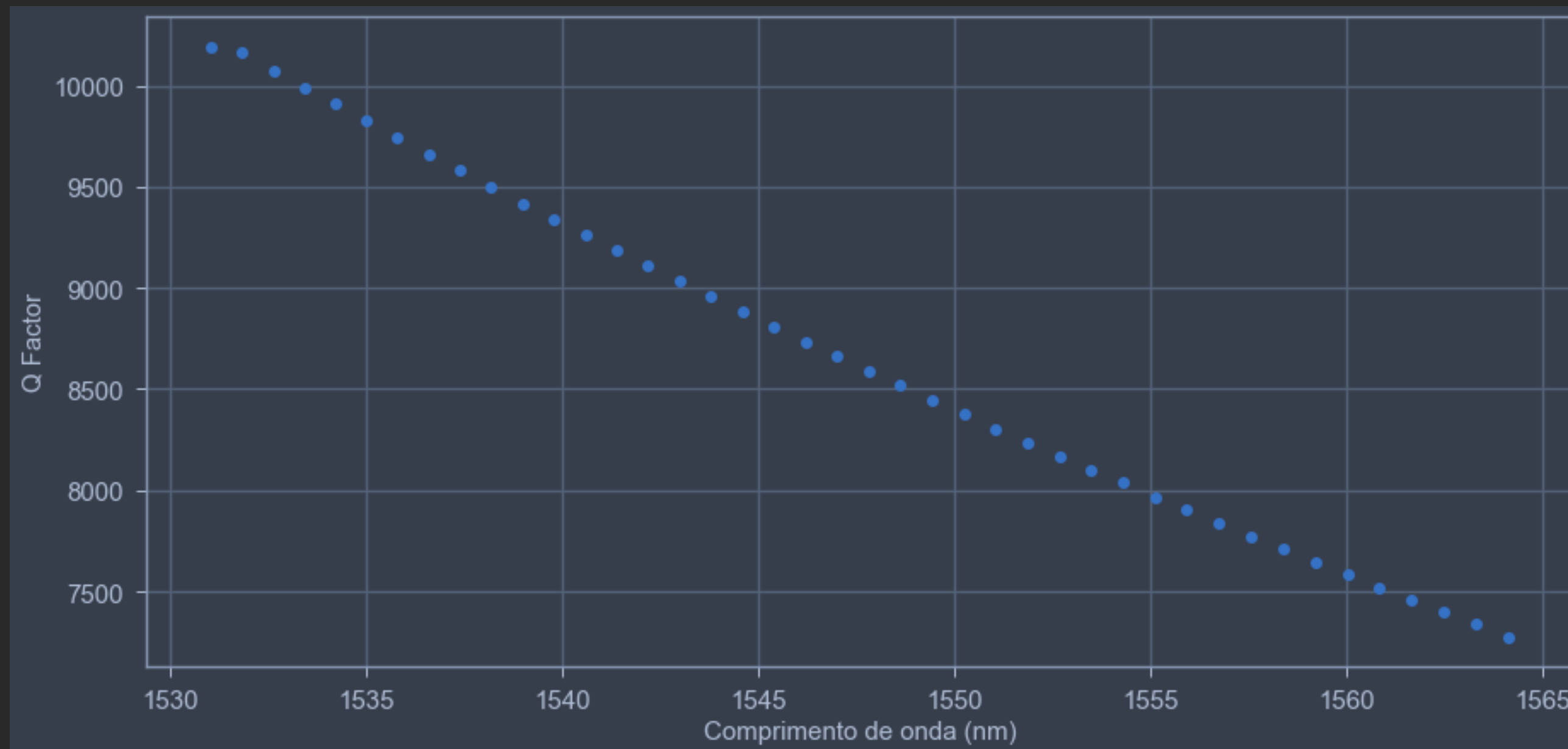
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



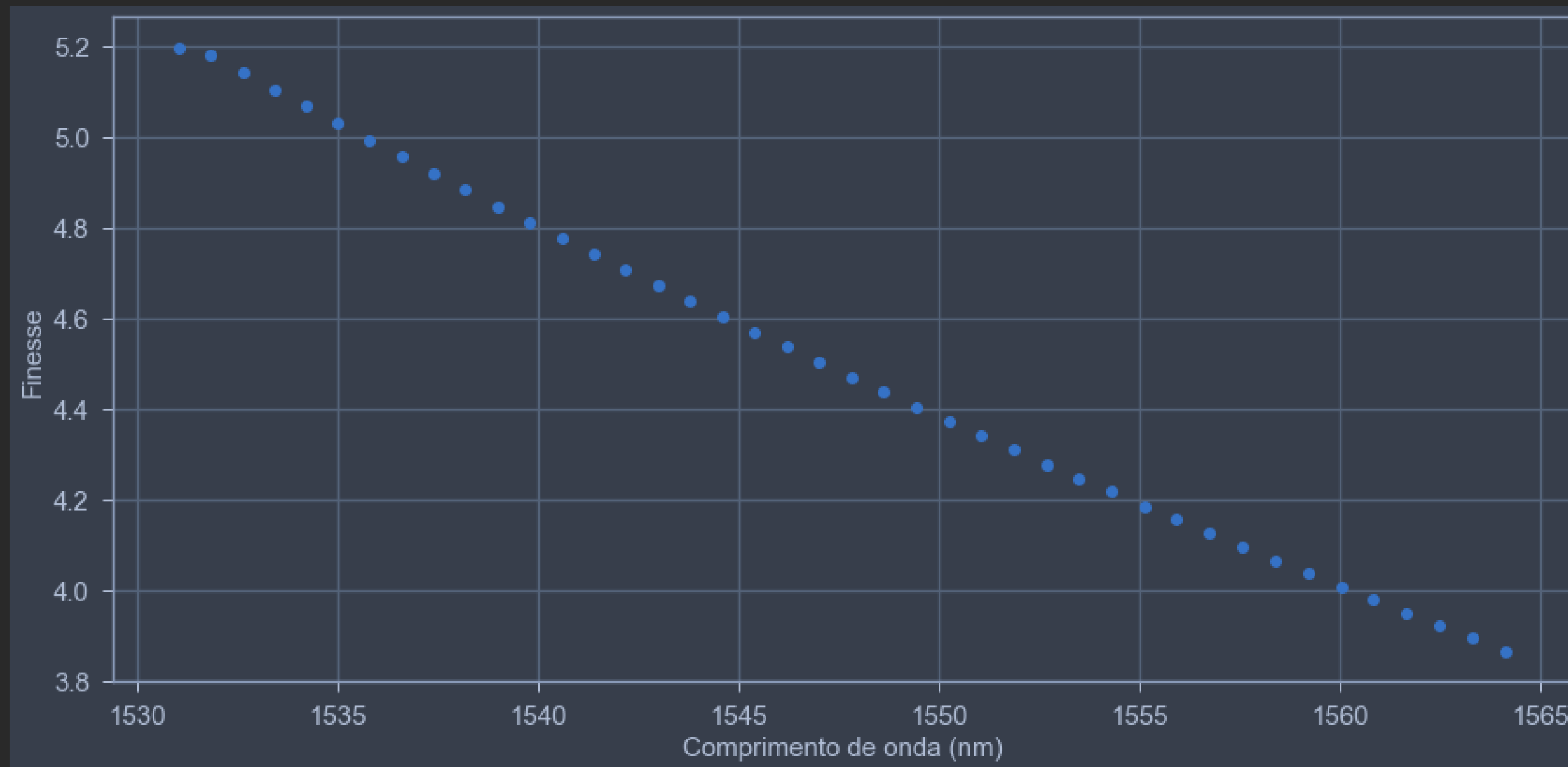
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultado Interconnect



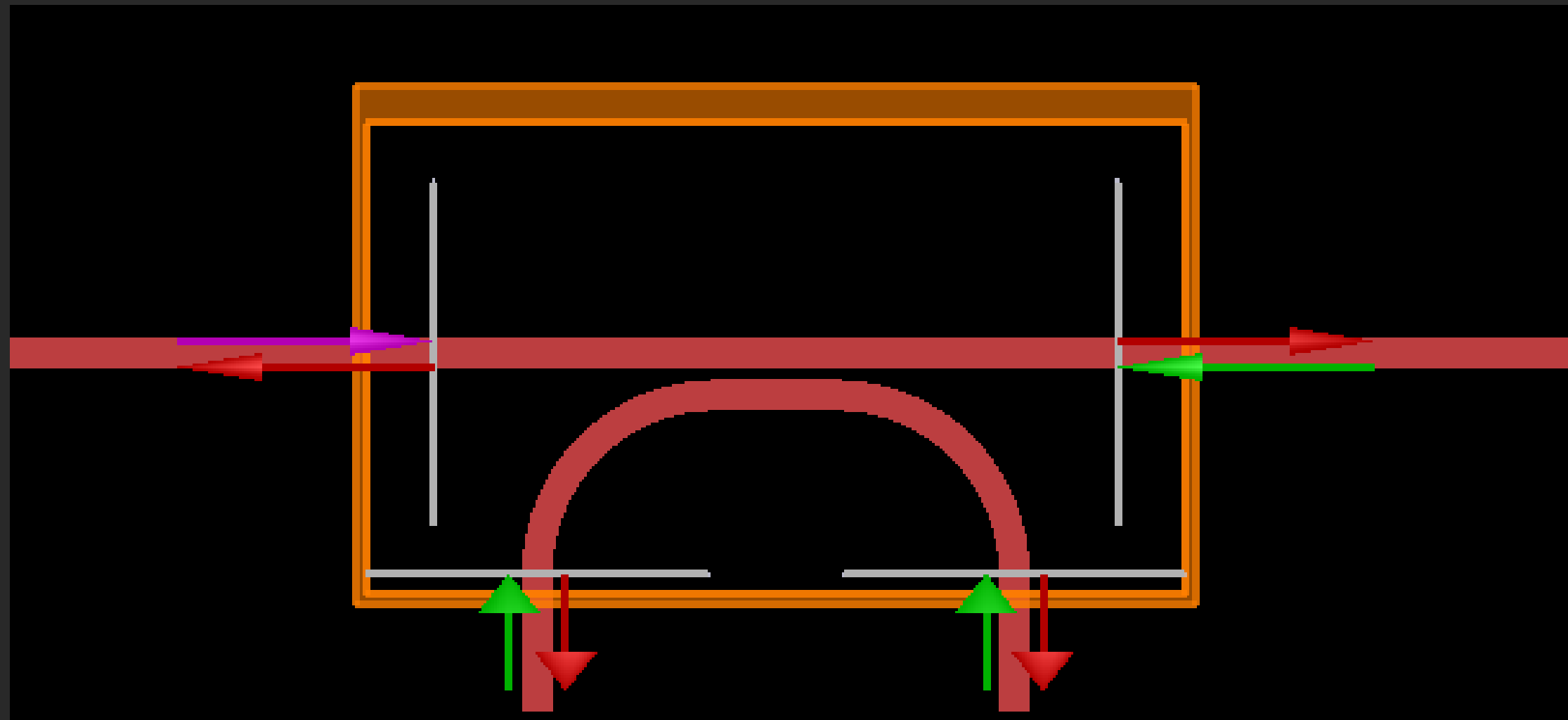
SEMANA 5

Otimização do 1º modelo

DESIGN DE UM ANEL DE RESSONÂNCIA

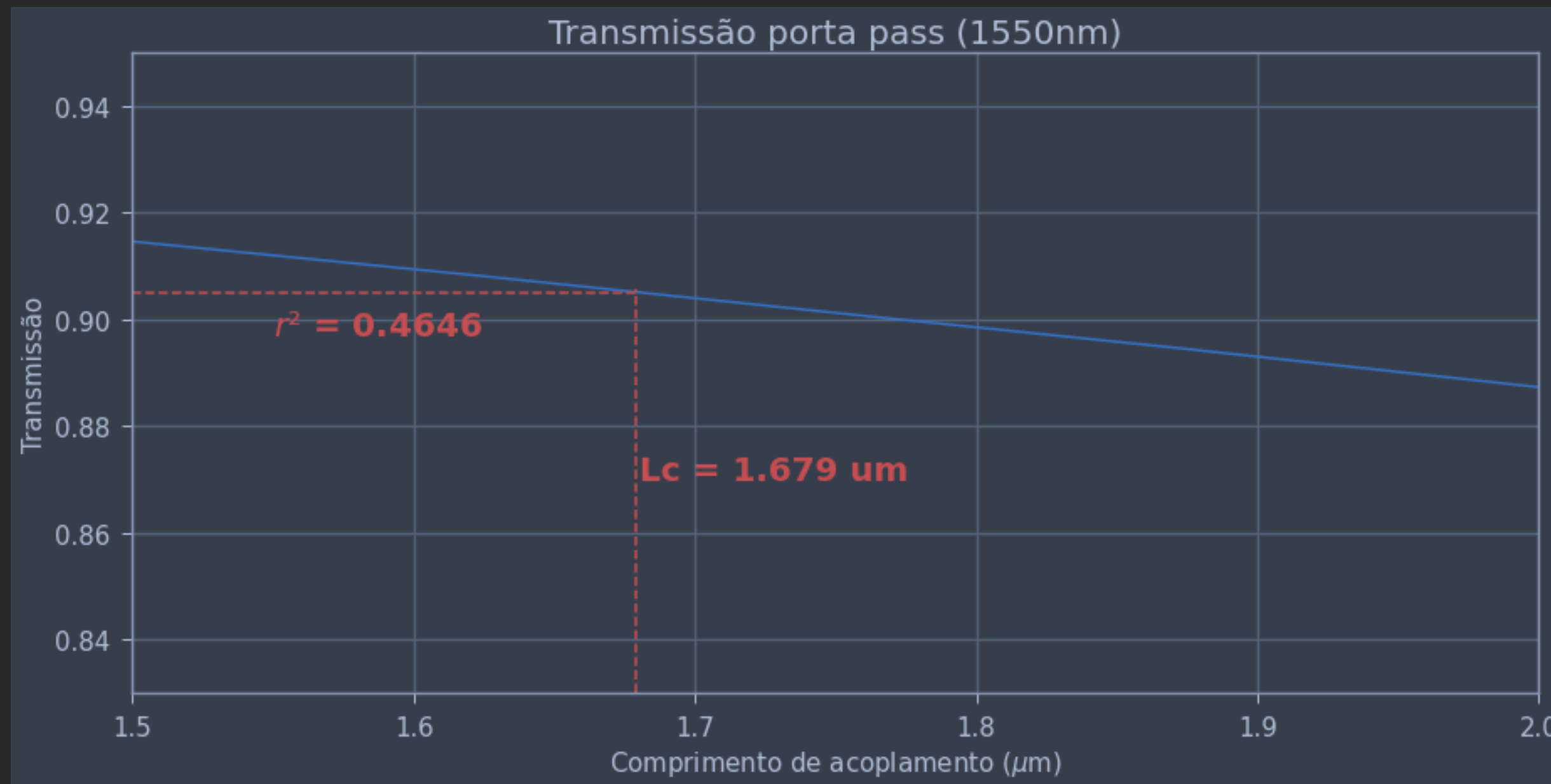
Segunda otimização

Chip buried



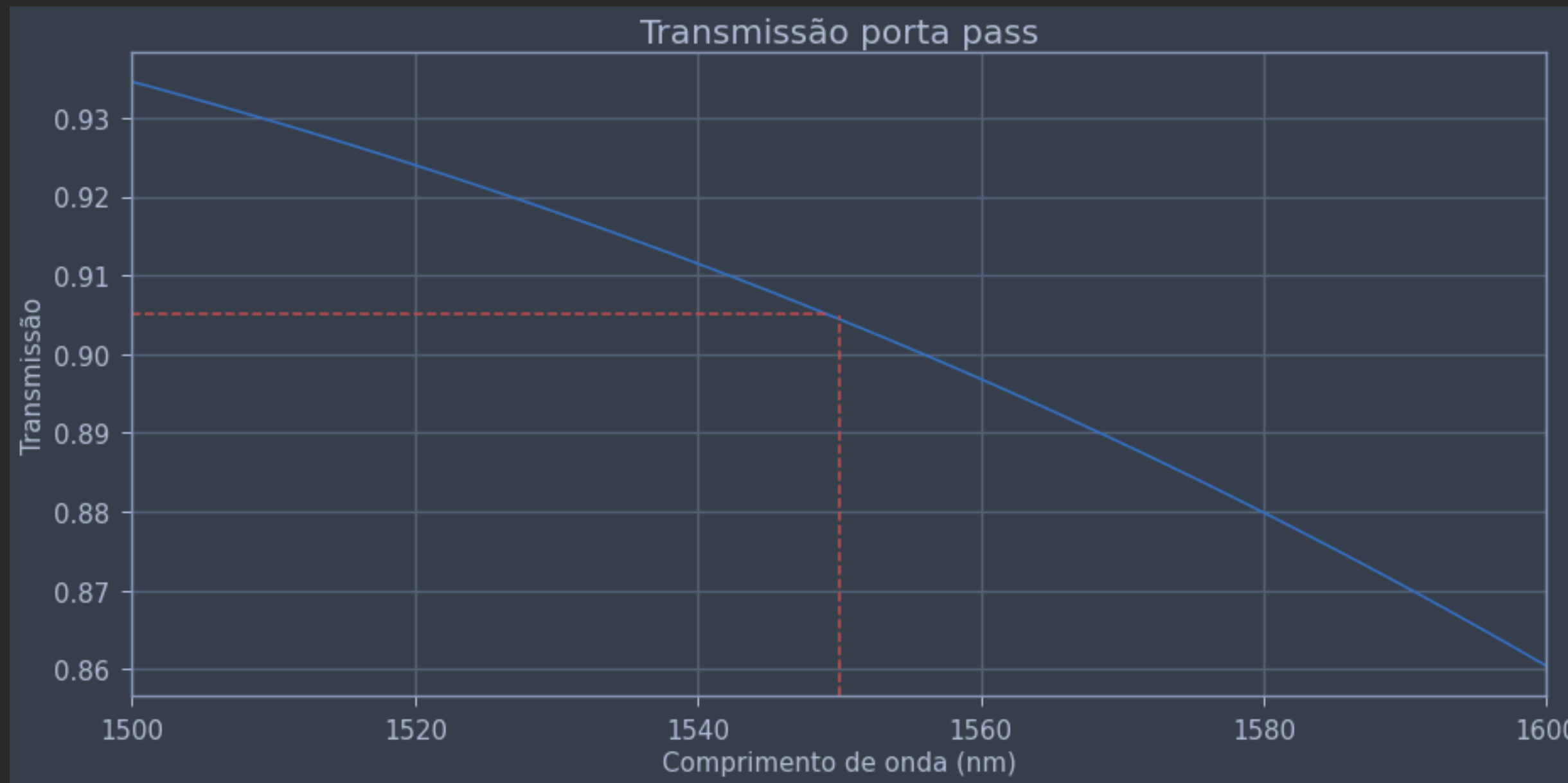
DESIGN DE UM ANEL DE RESSONÂNCIA

resultados sweep



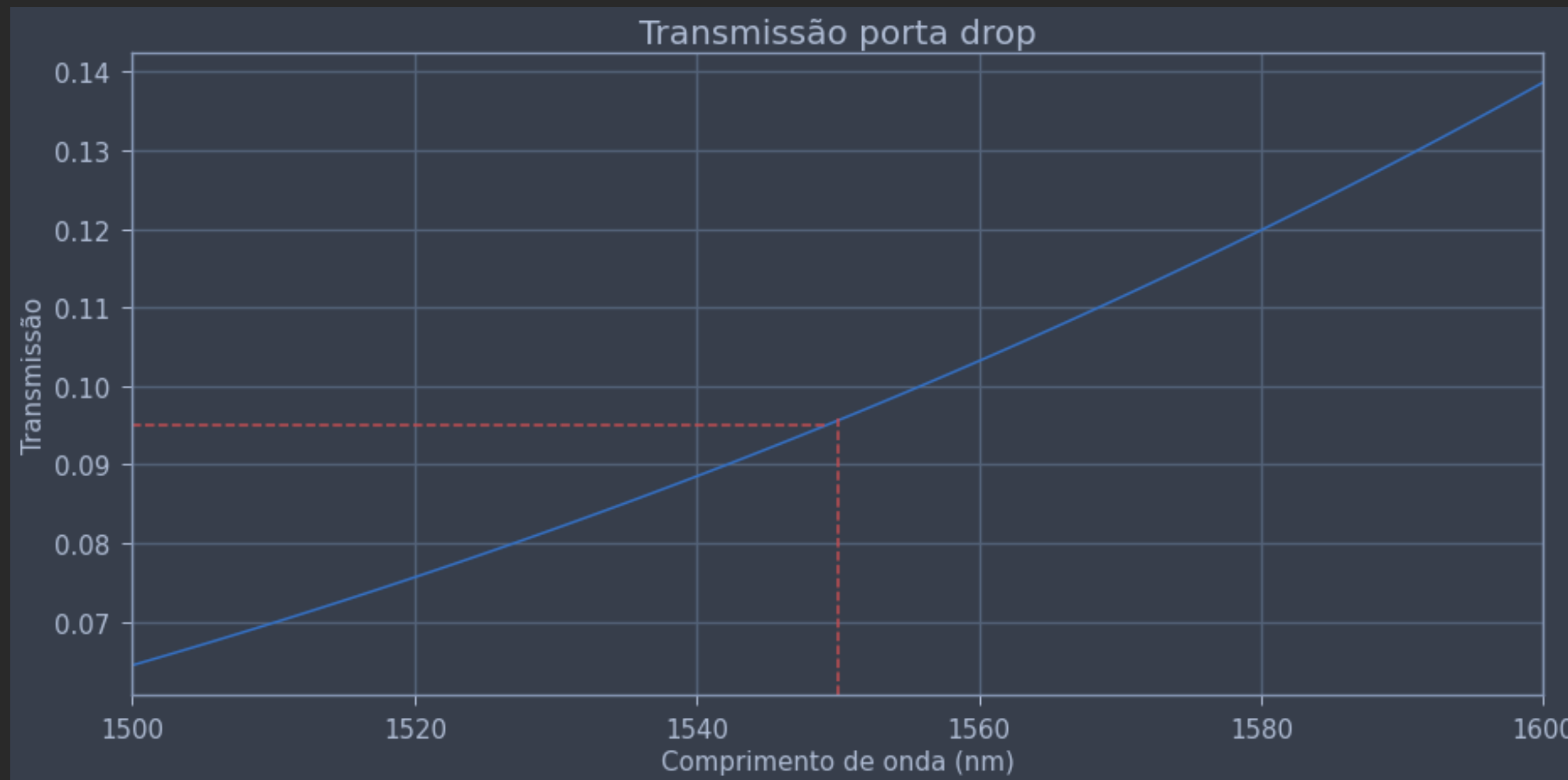
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação FDTD otimizada



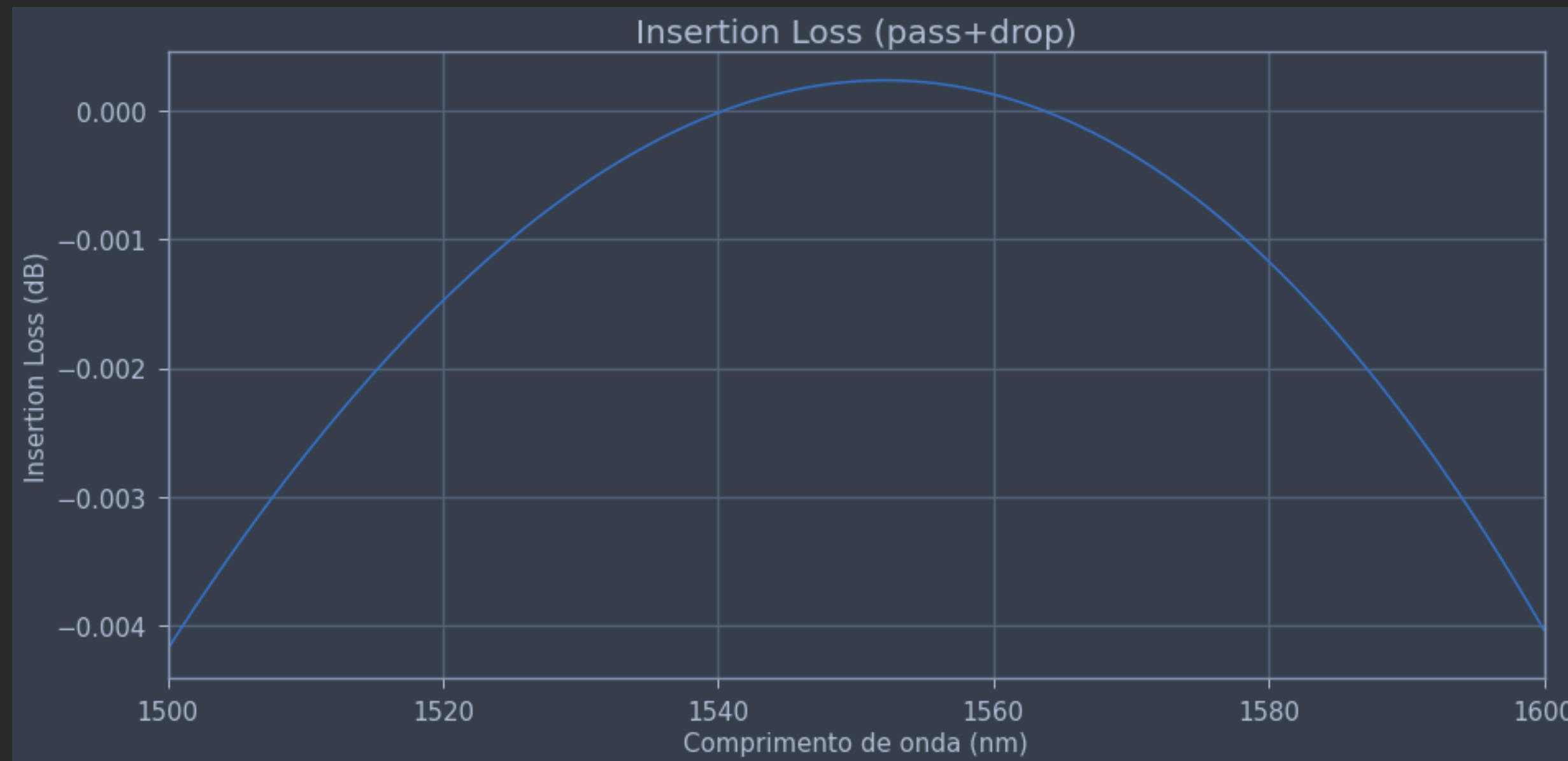
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação FDTD otimizada



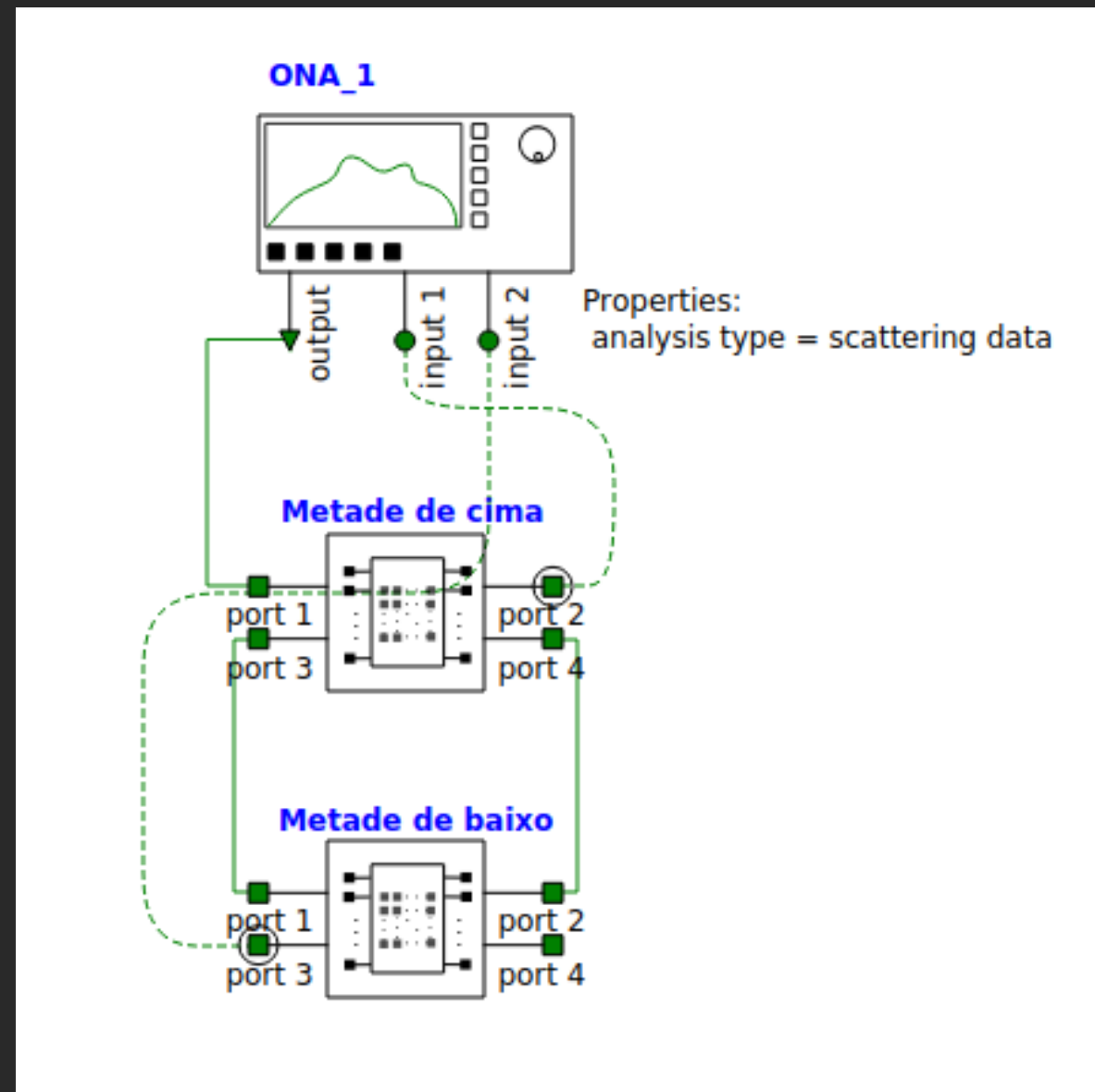
DESIGN DE UM ANEL DE RESSONÂNCIA

Simulação FDTD otimizada



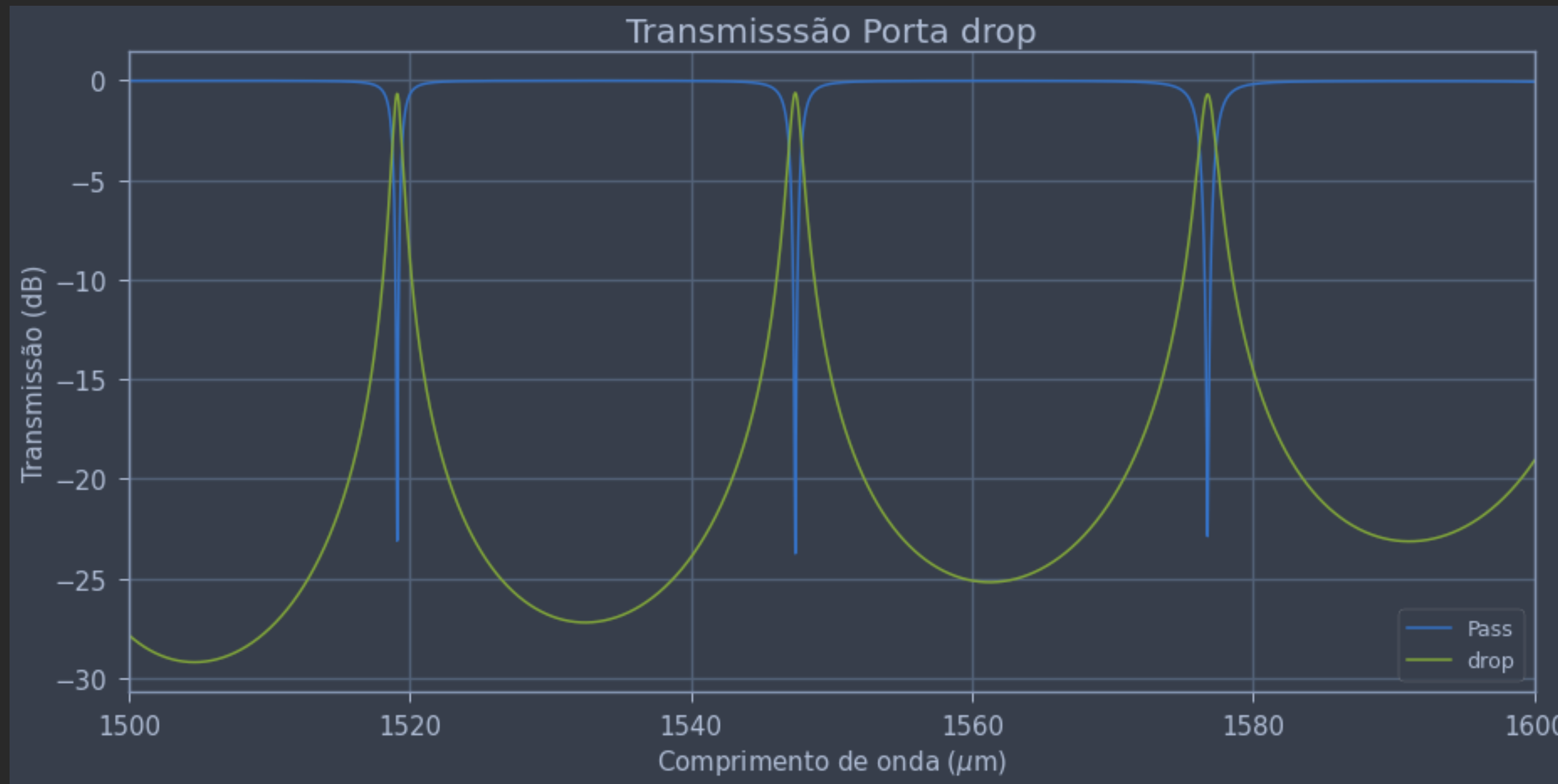
DESIGN DE UM ANEL DE RESSONÂNCIA

Export Interconnect



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



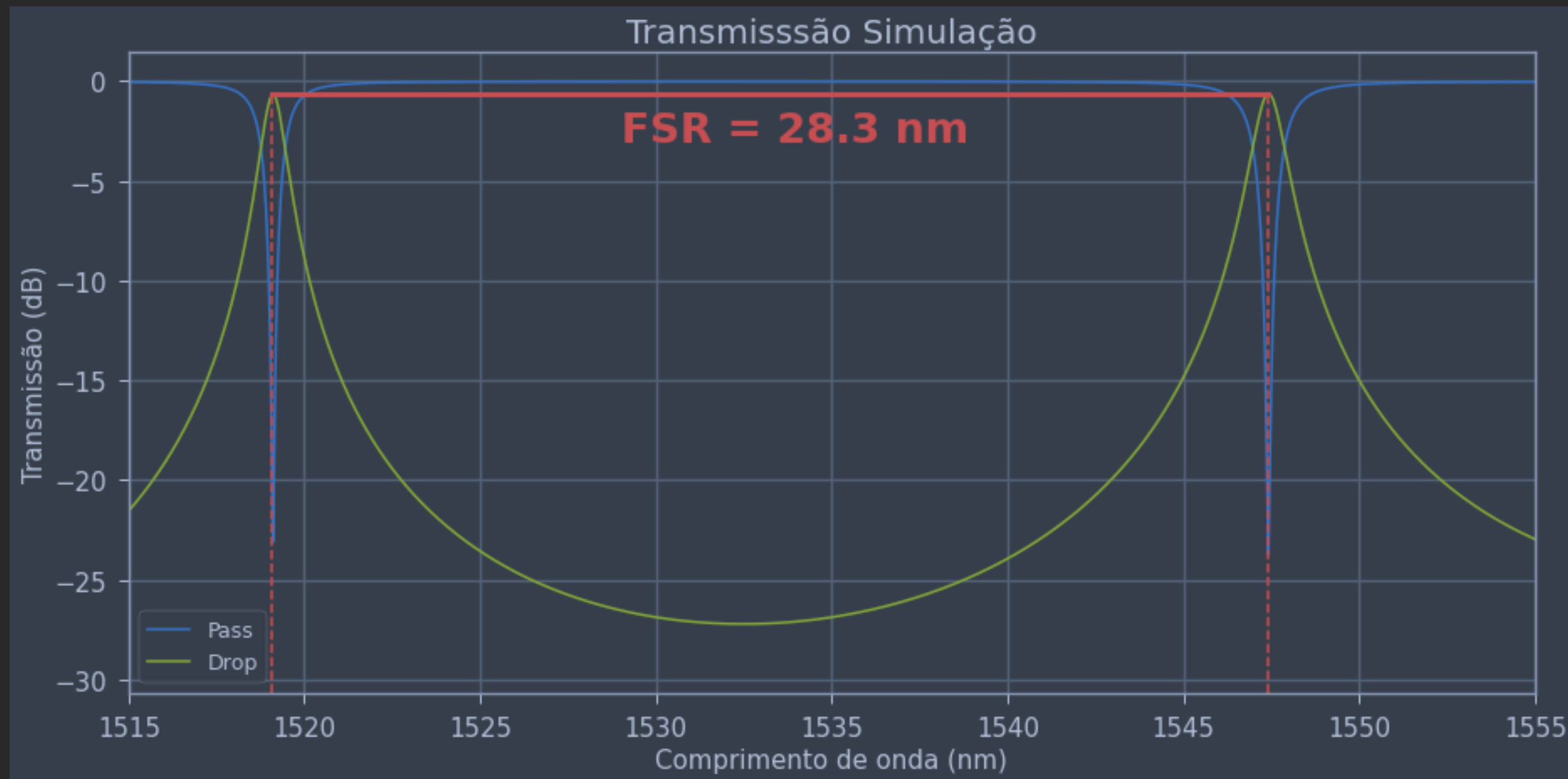
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



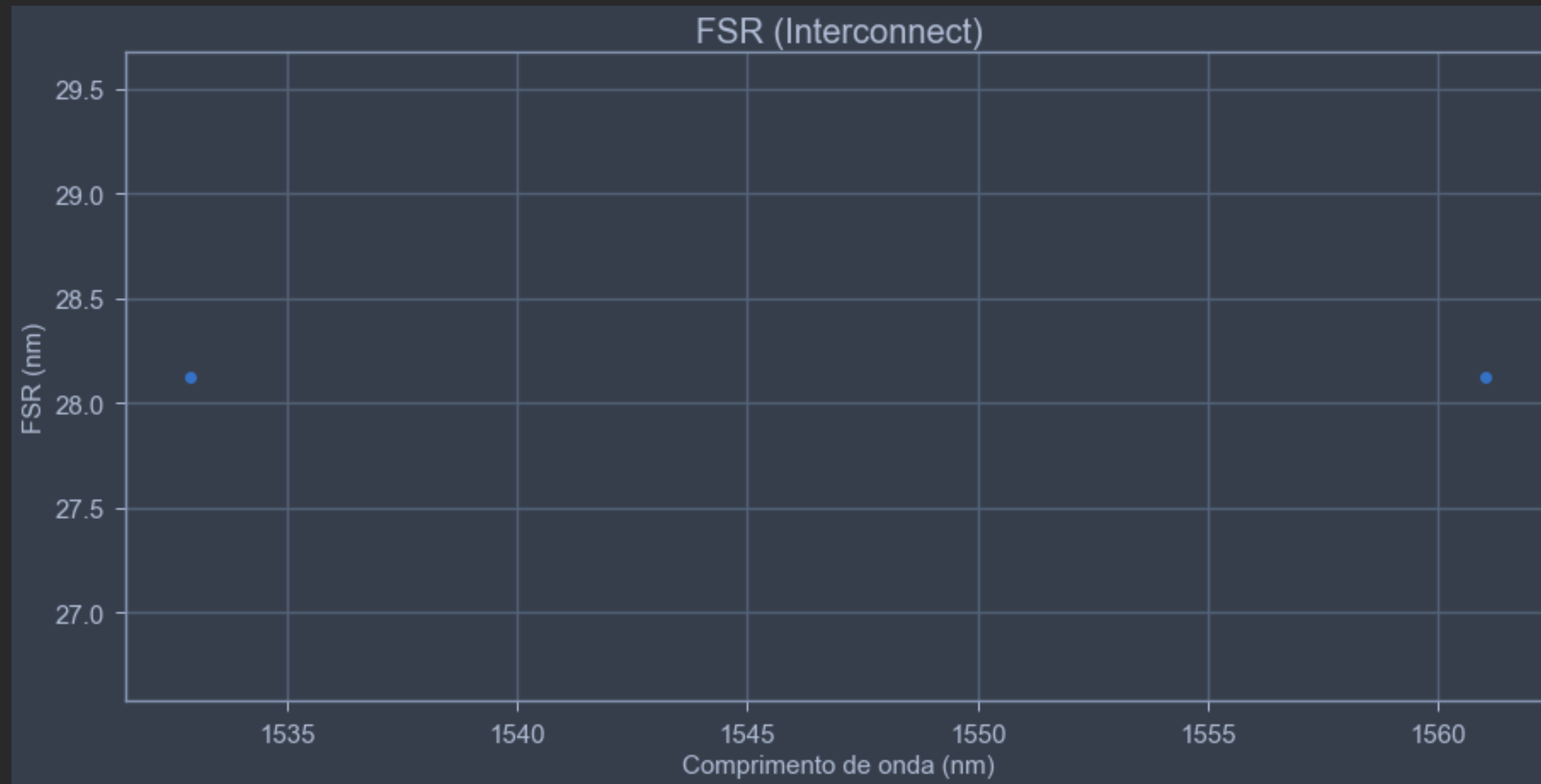
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



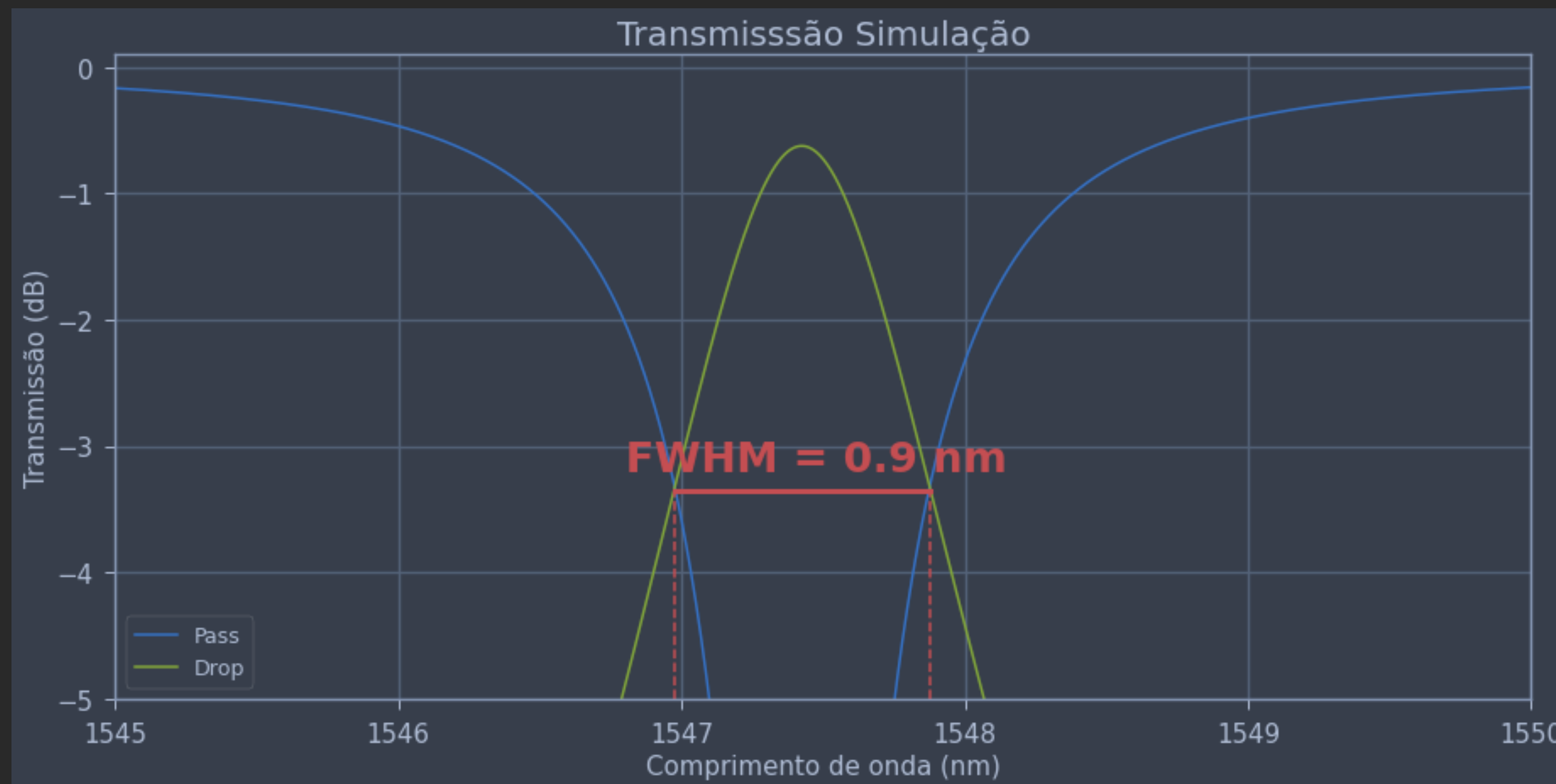
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



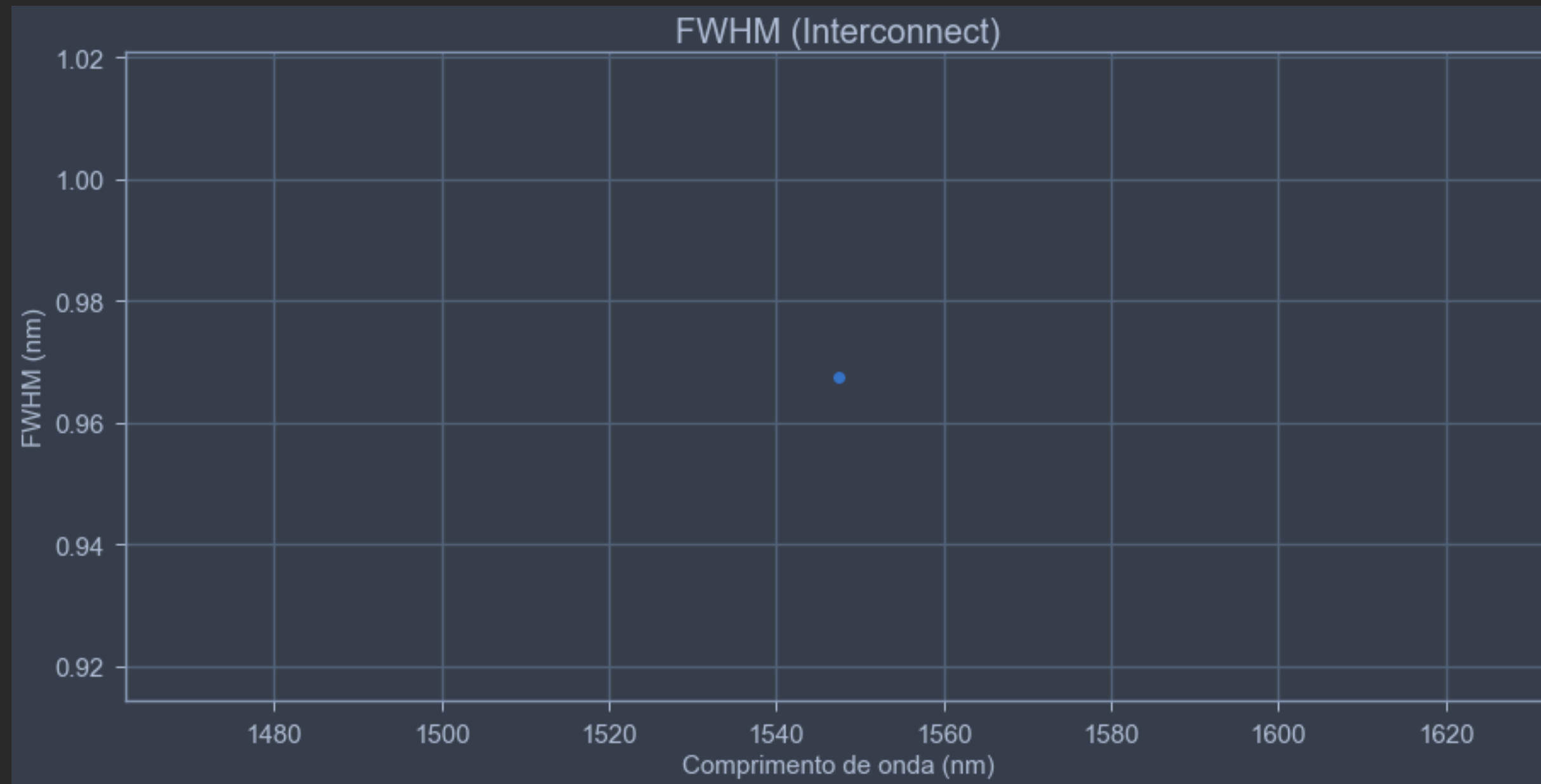
DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados



DESIGN DE UM ANEL DE RESSONÂNCIA

Resultados finais do modelo 1

Teorico

FSR = 27.7 nm

FWHM = 0.88 nm

Finesse = 31.48

Q factor = 1761

SOI in SiO₂

Obtido

FSR = 28.3 nm

FWHM = 0.9 nm

Finesse = 31.44

Q factor = 1722

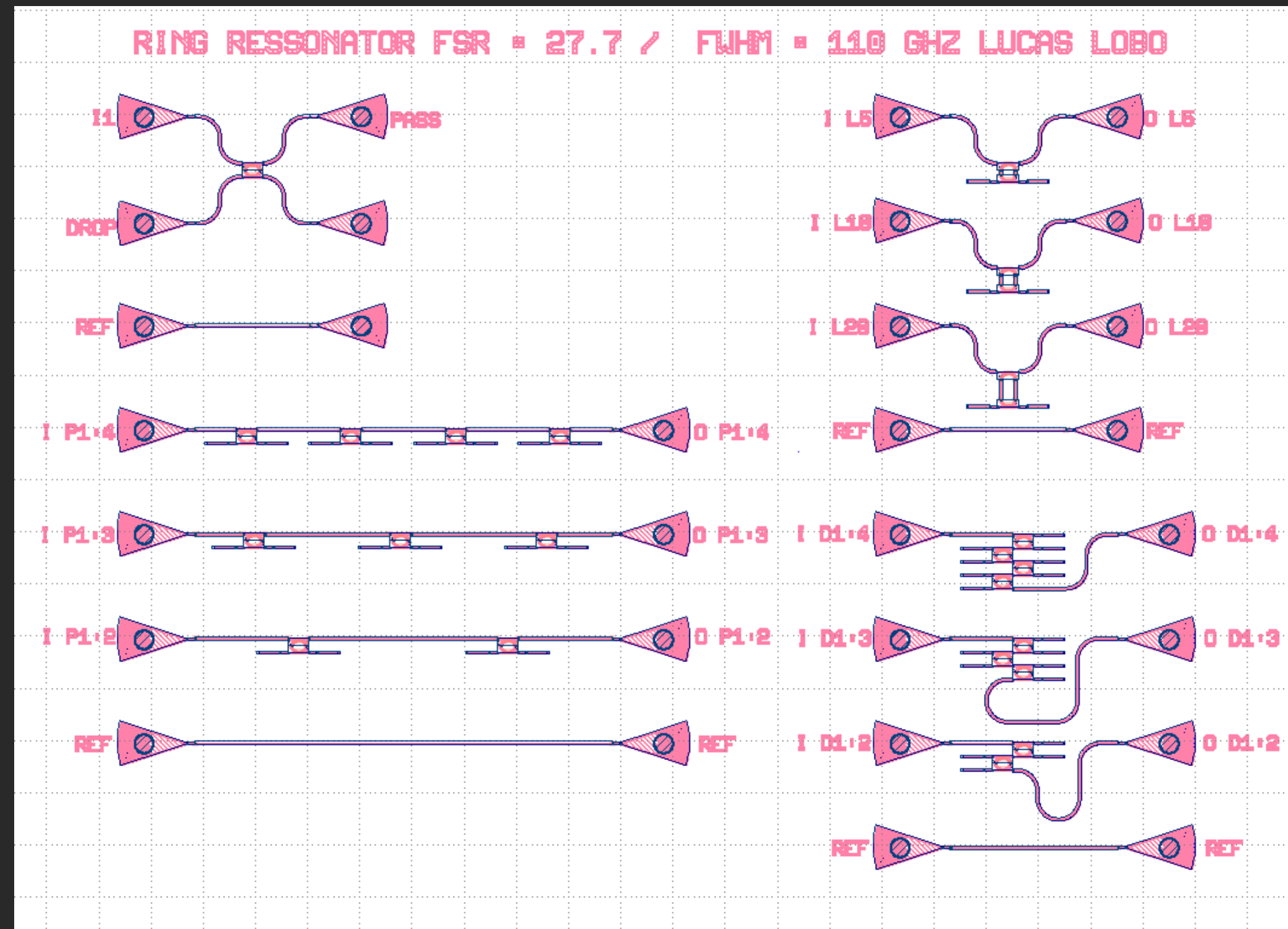
Buried in SiO₂

SEMANA 6

Design do chip

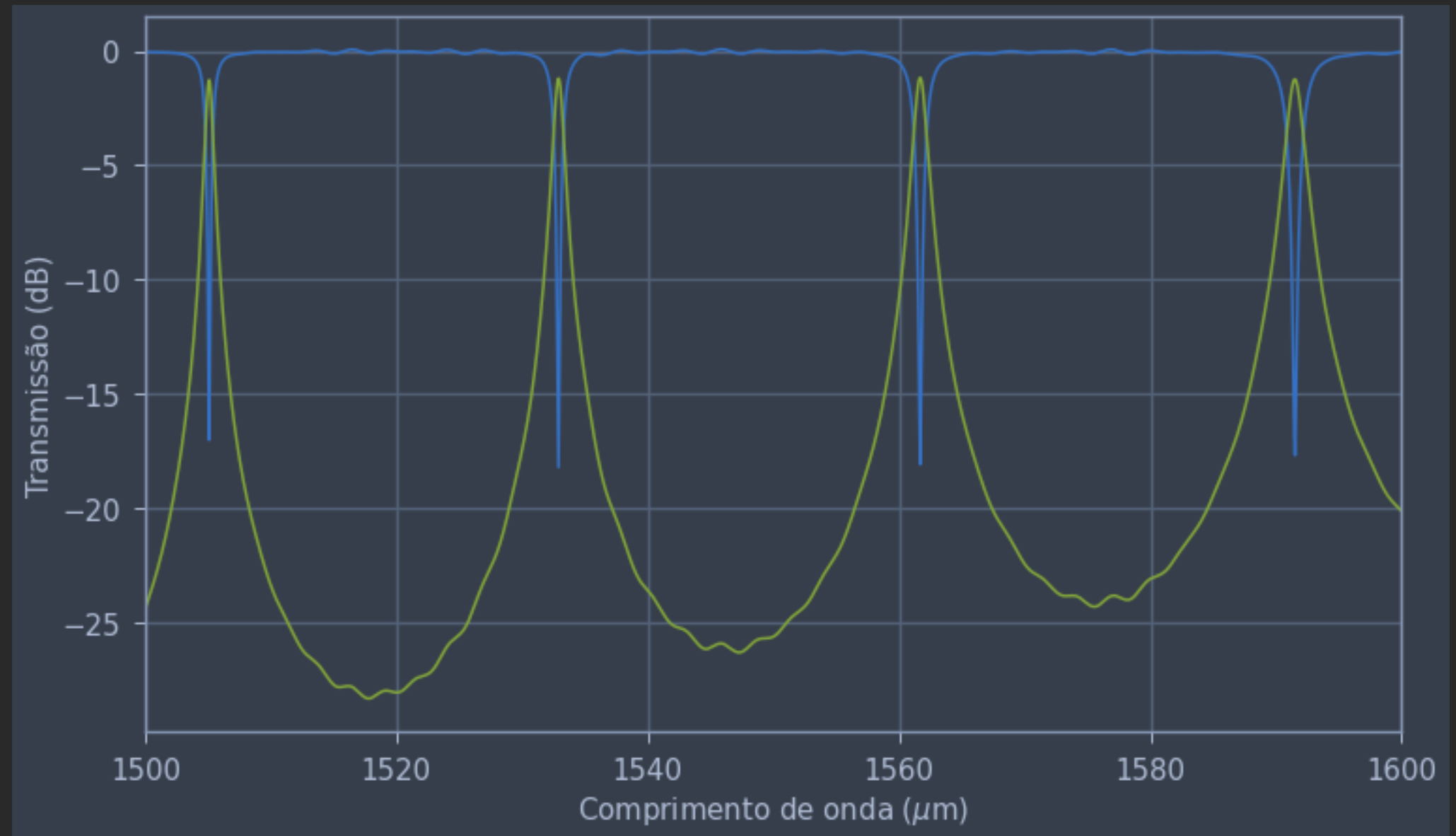
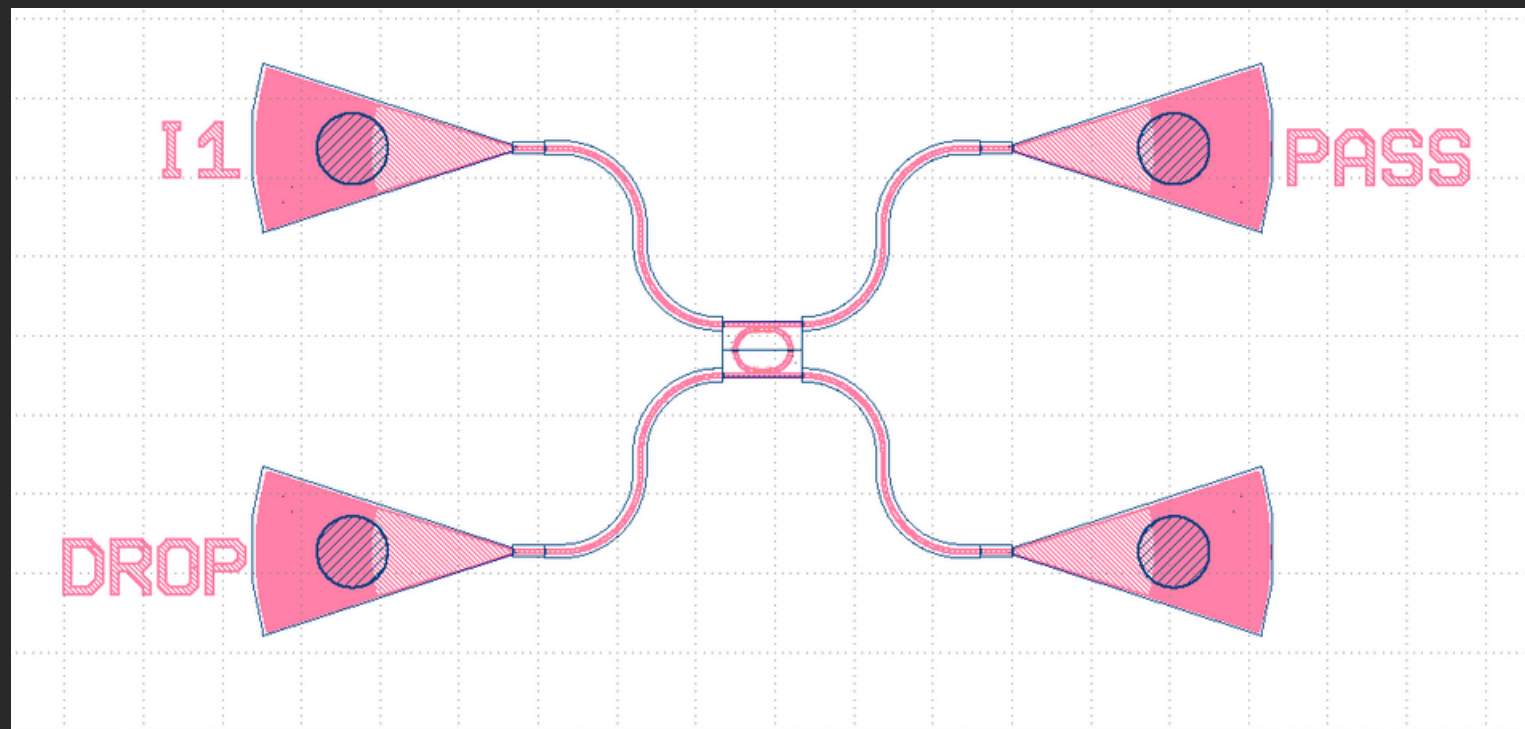
DESIGN DE UM ANEL DE RESSONÂNCIA

Chip completo



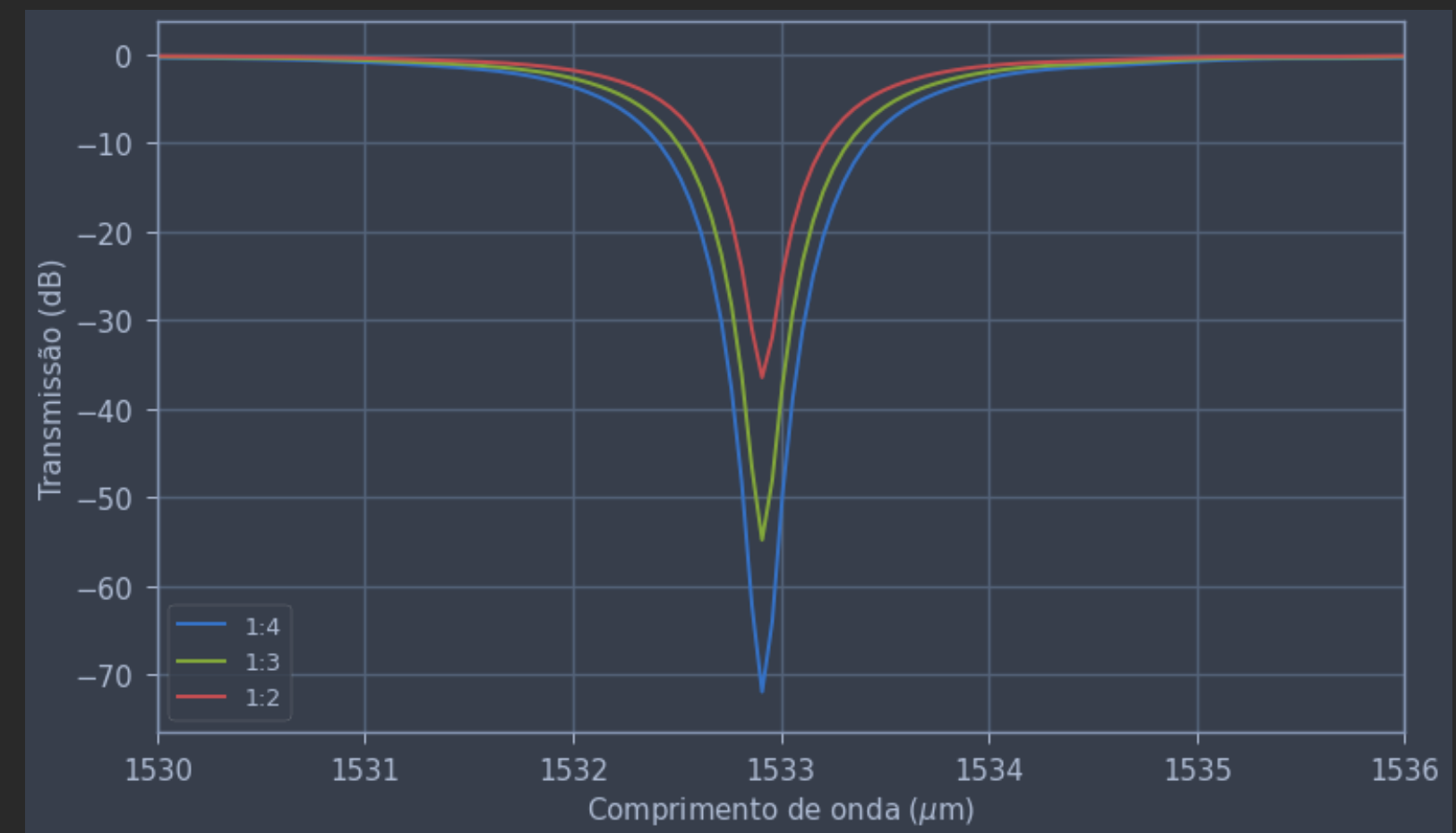
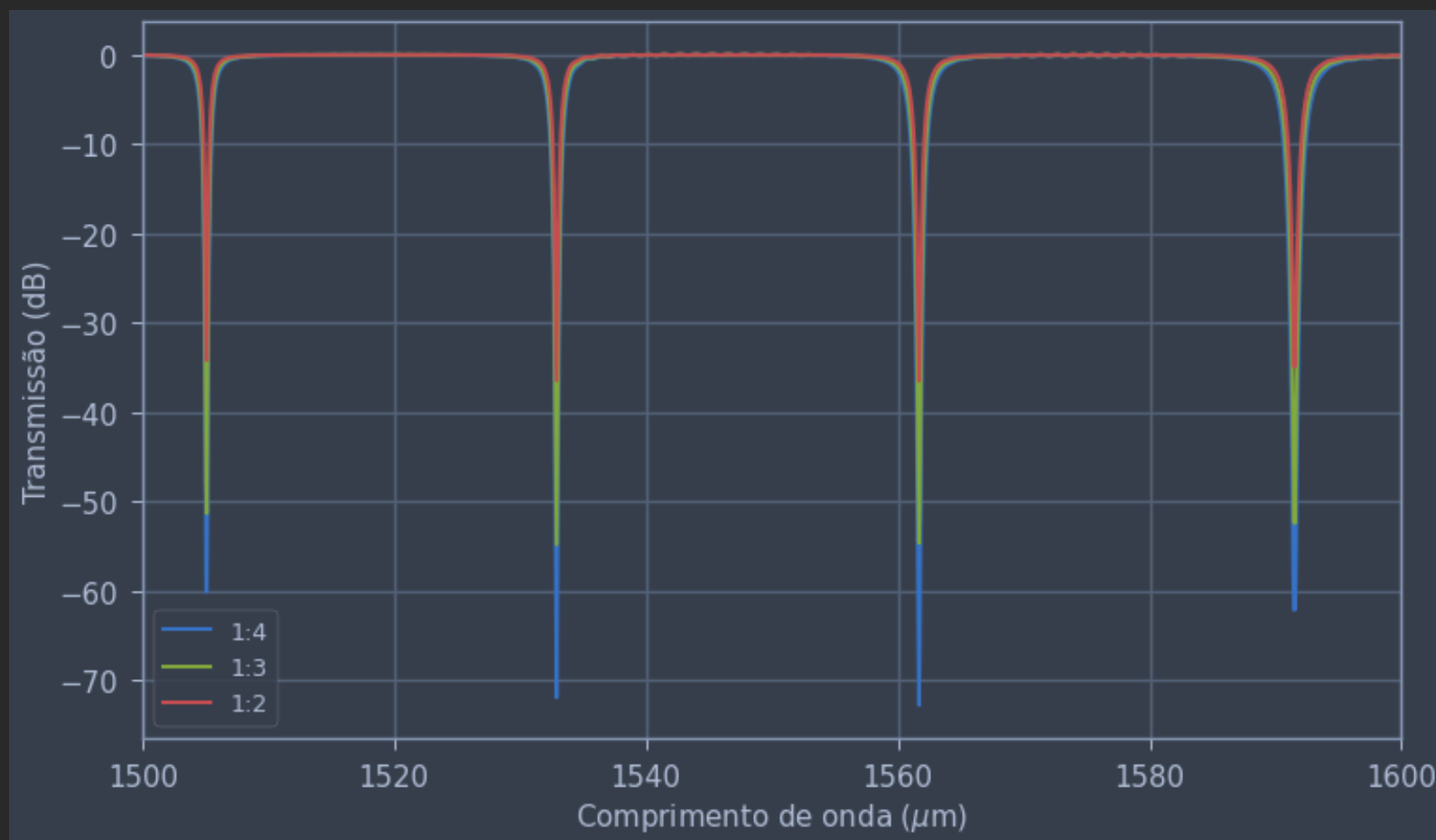
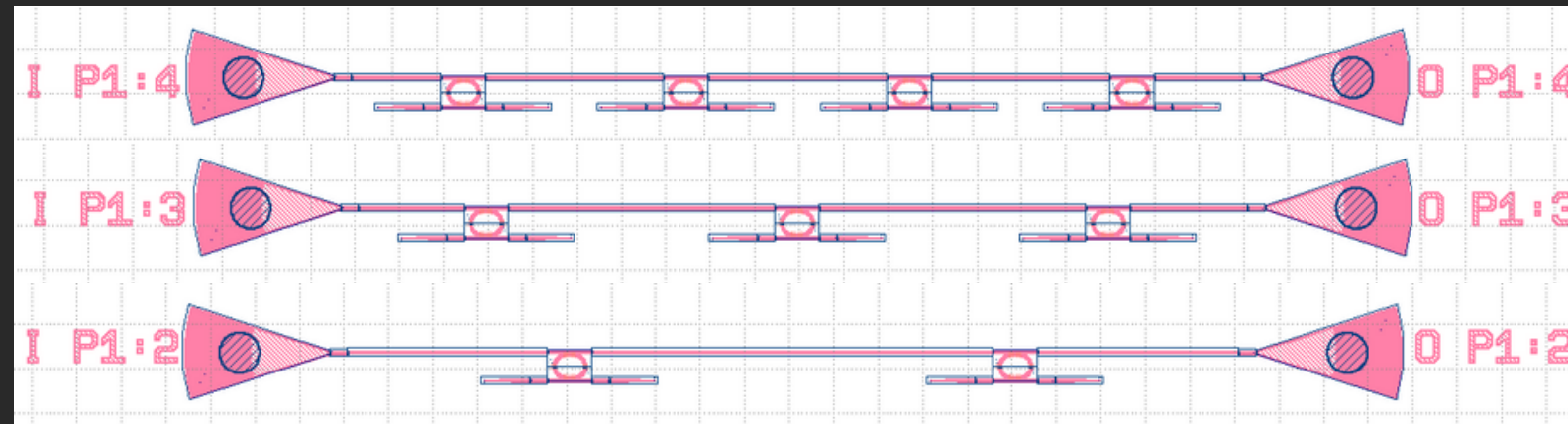
DESIGN DE UM ANEL DE RESSONÂNCIA

Circuito basico



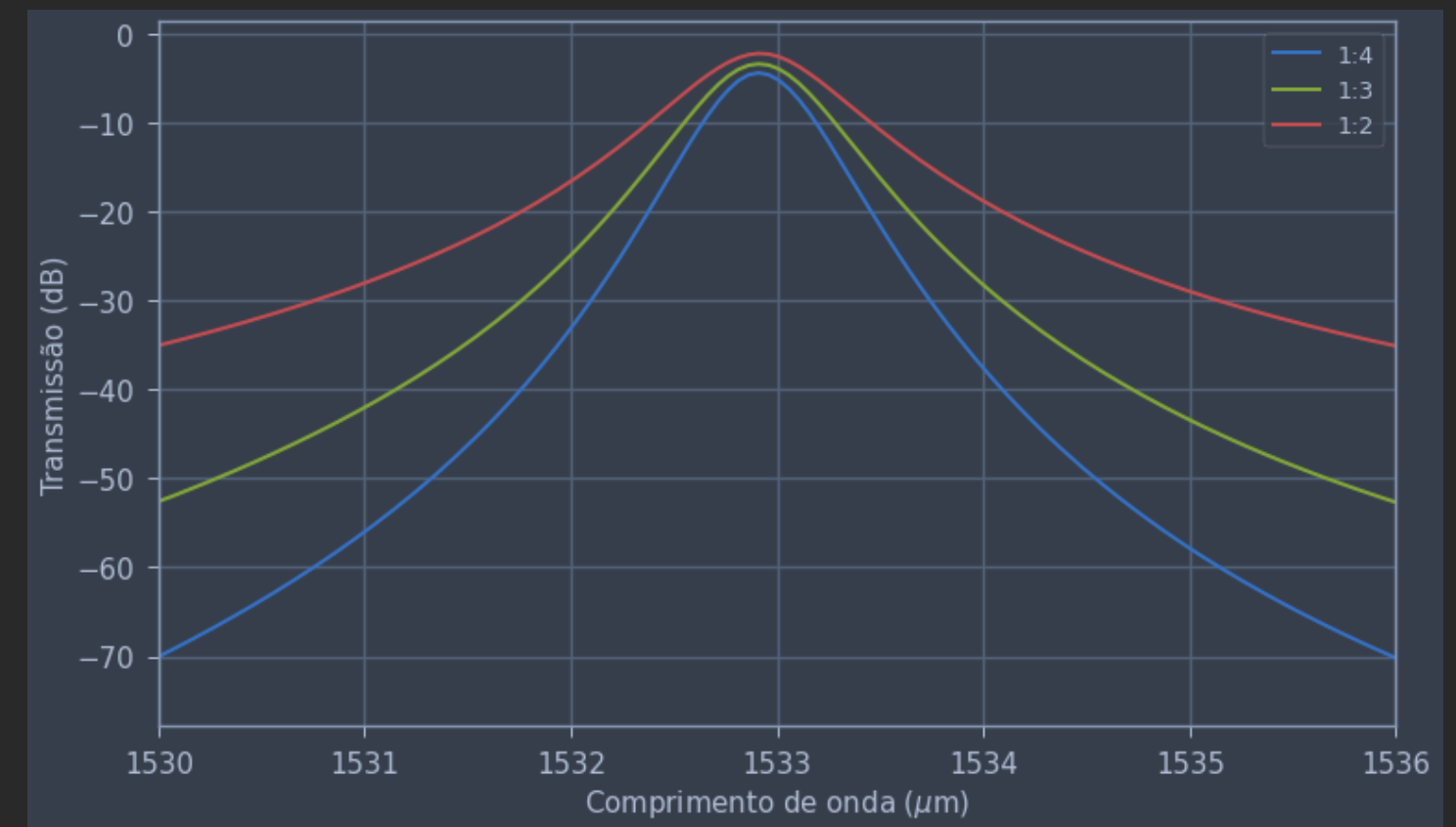
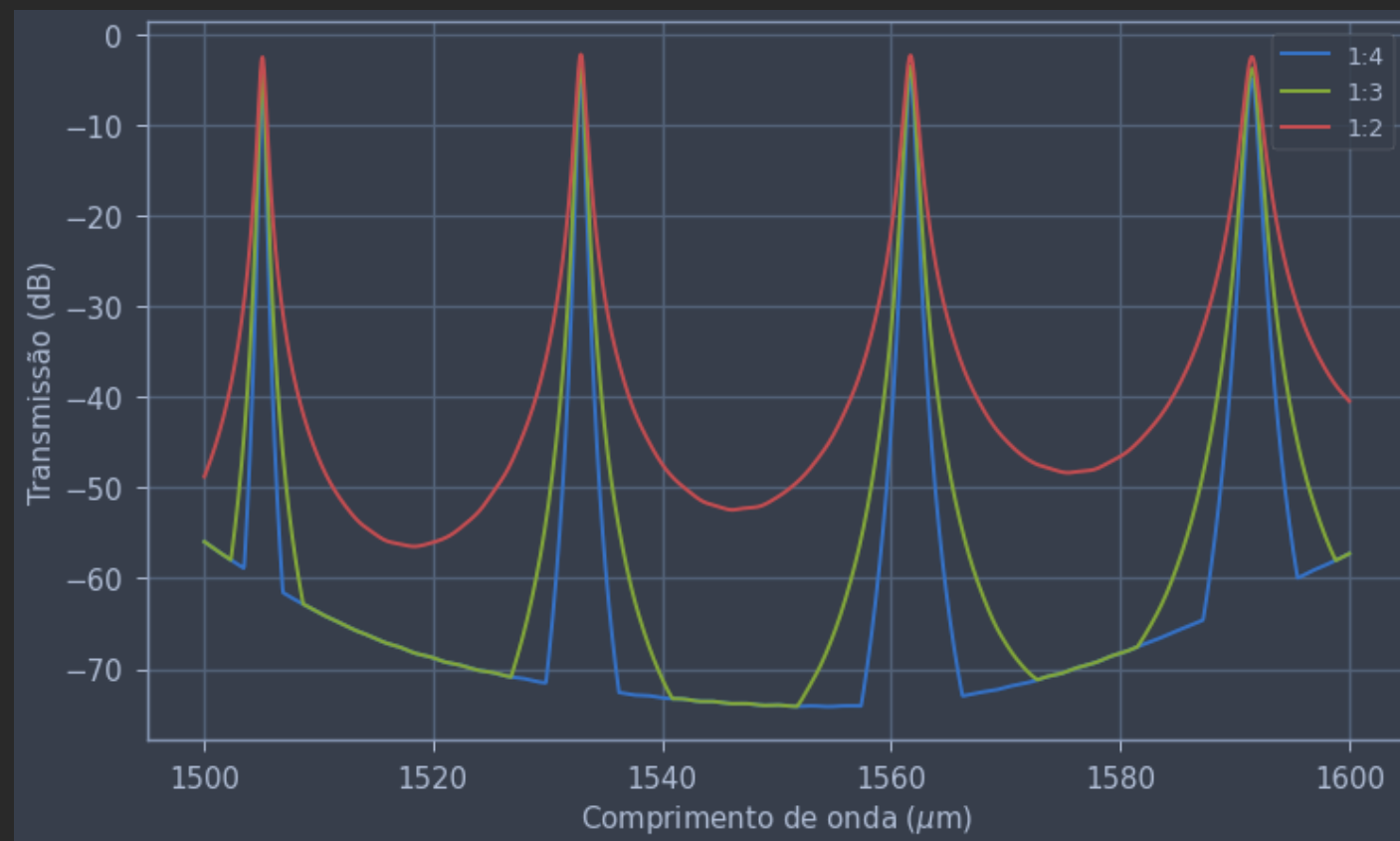
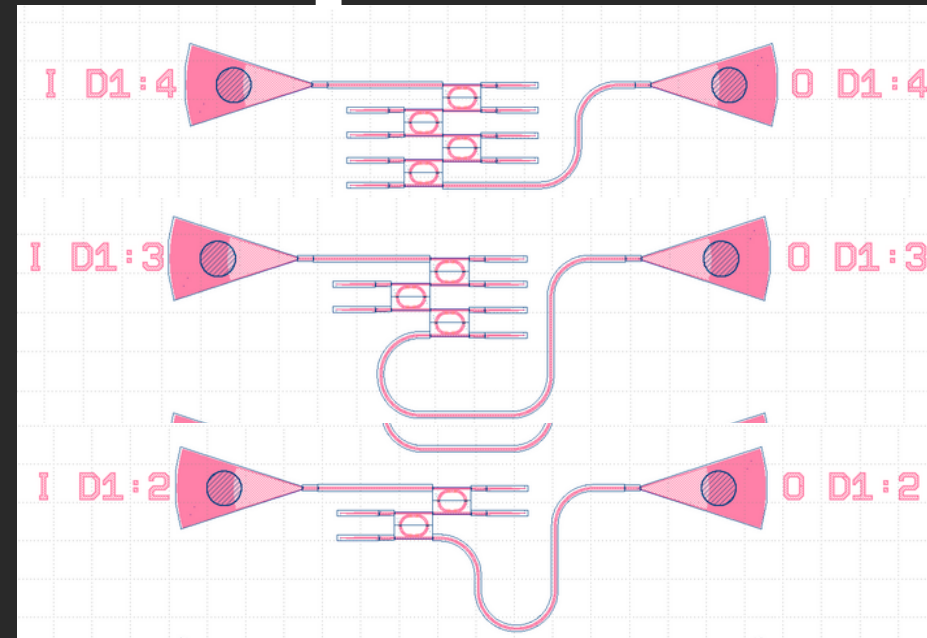
DESIGN DE UM ANEL DE RESSONÂNCIA

porta Pass em cascata



DESIGN DE UM ANEL DE RESSONÂNCIA

porta Drop em cascata



DESIGN DE UM ANEL DE RESSONÂNCIA

Aumento do comprimento do anel

