

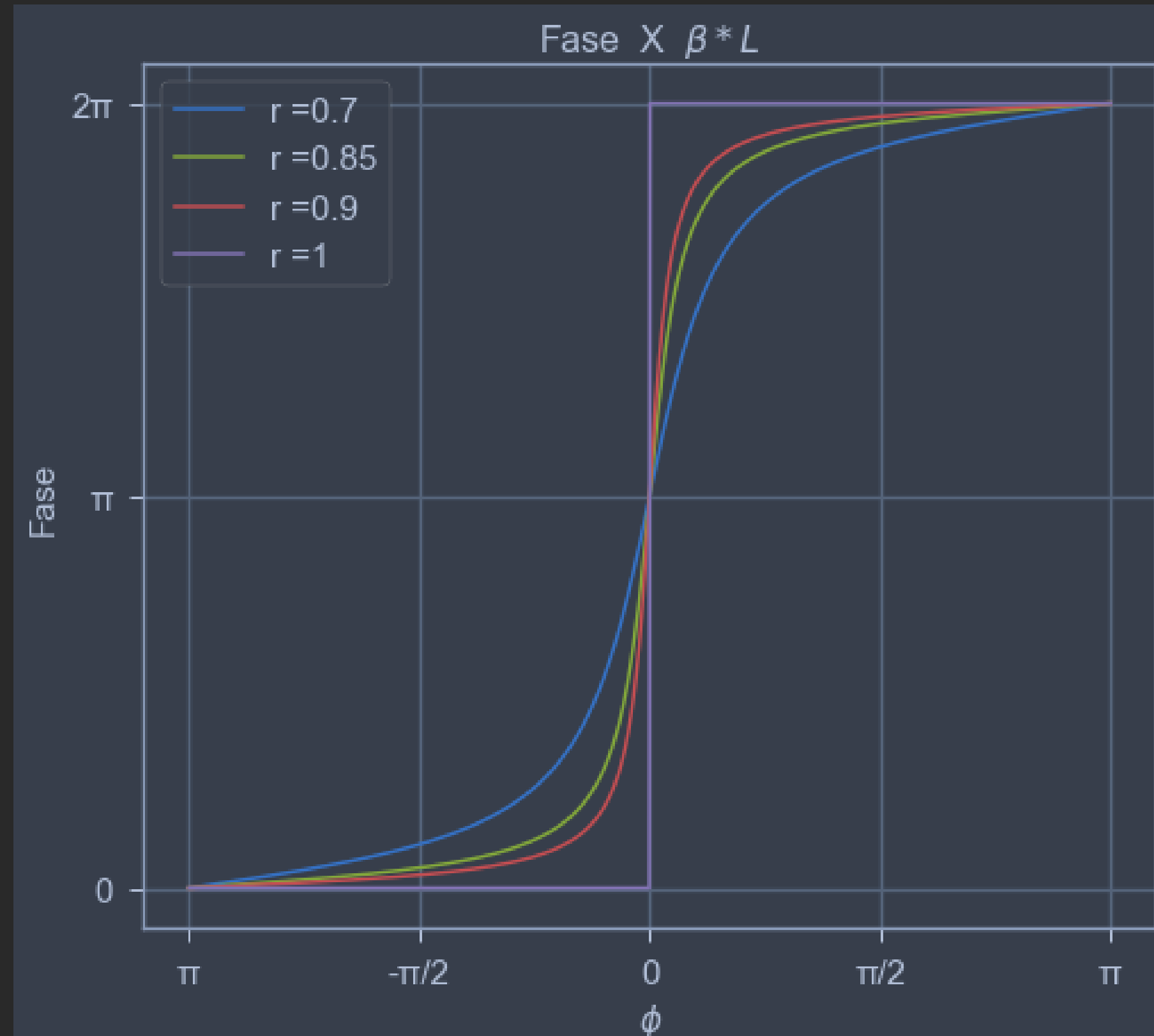
# DESIGN

# ANEL DE RESSONANCIA

# SEMANA 1 E 2

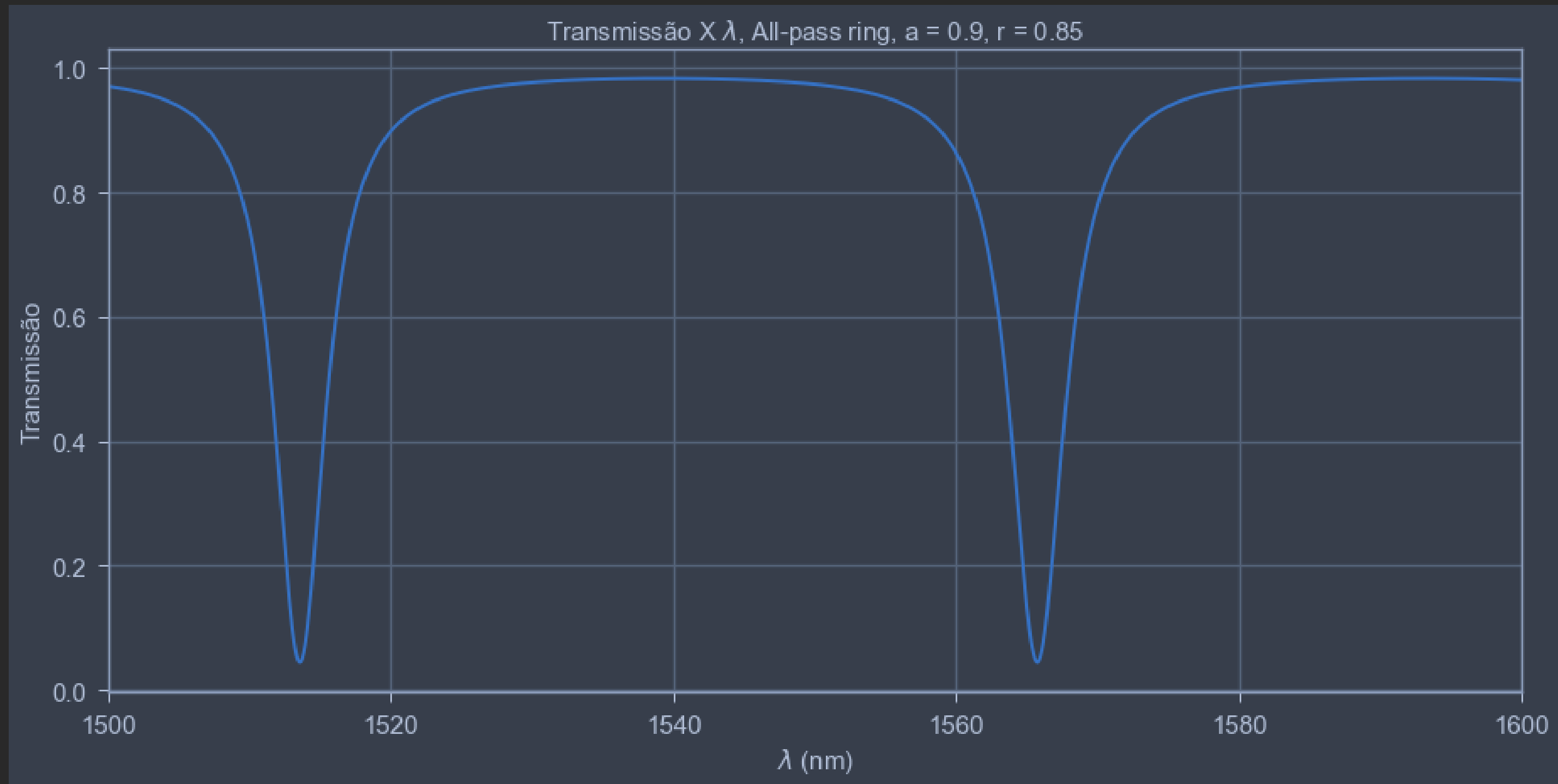
## ESTUDO DE REFERENCIAS

# GRÁFICOS TEÓRICOS



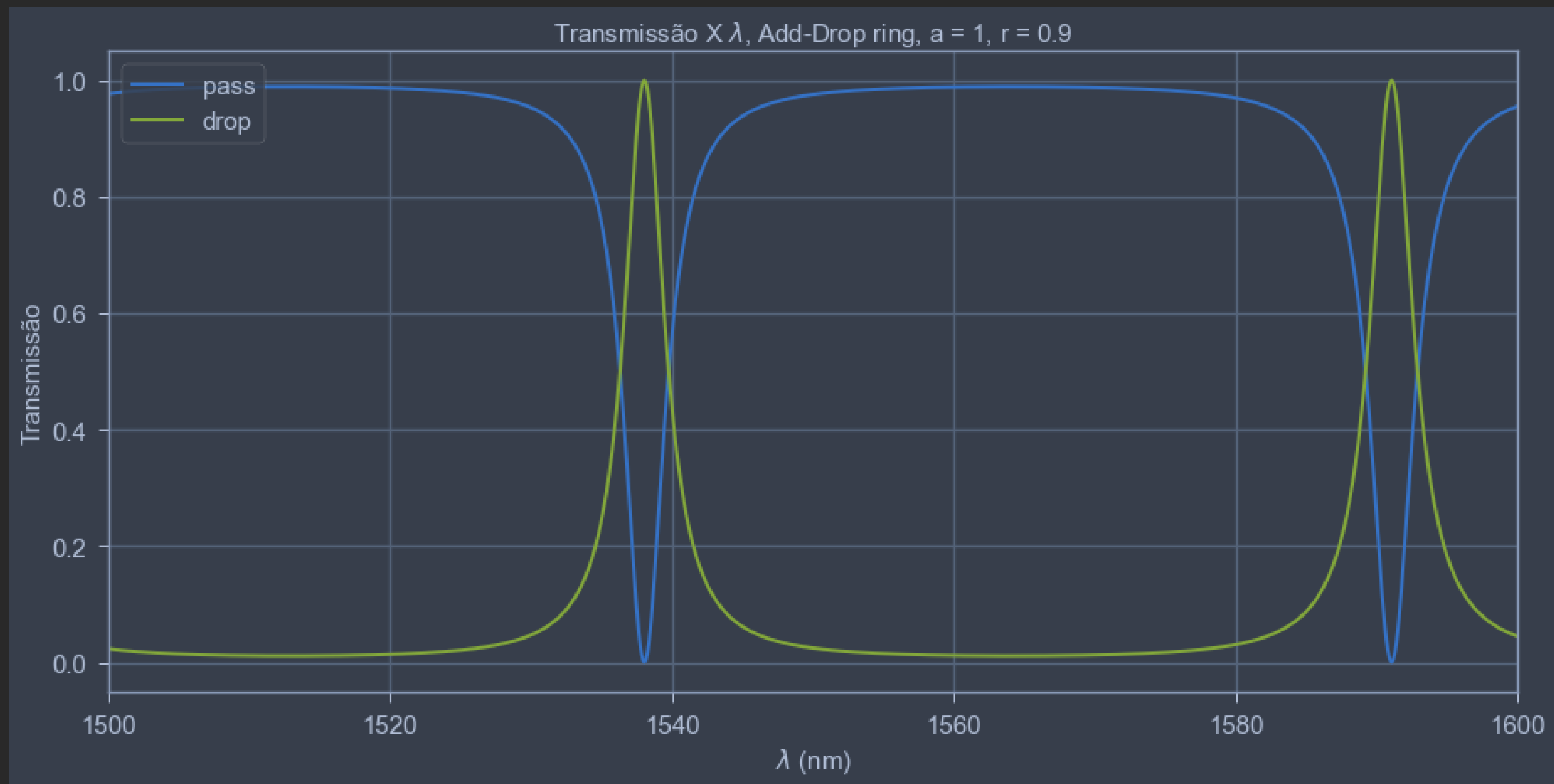
# GRÁFICOS TEÓRICOS

Transmissão All pass ring



# GRÁFICOS TEÓRICOS

## Transmissão Add-drop ring



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Especificações

**FSR = 27.7 nm**

**MWHW = 0.88 nm**

**SOI in SiO<sub>2</sub>**

**Guia: 0.45/0.22  $\mu\text{m}$**

**gap = 150 nm**

## Valores Teóricos

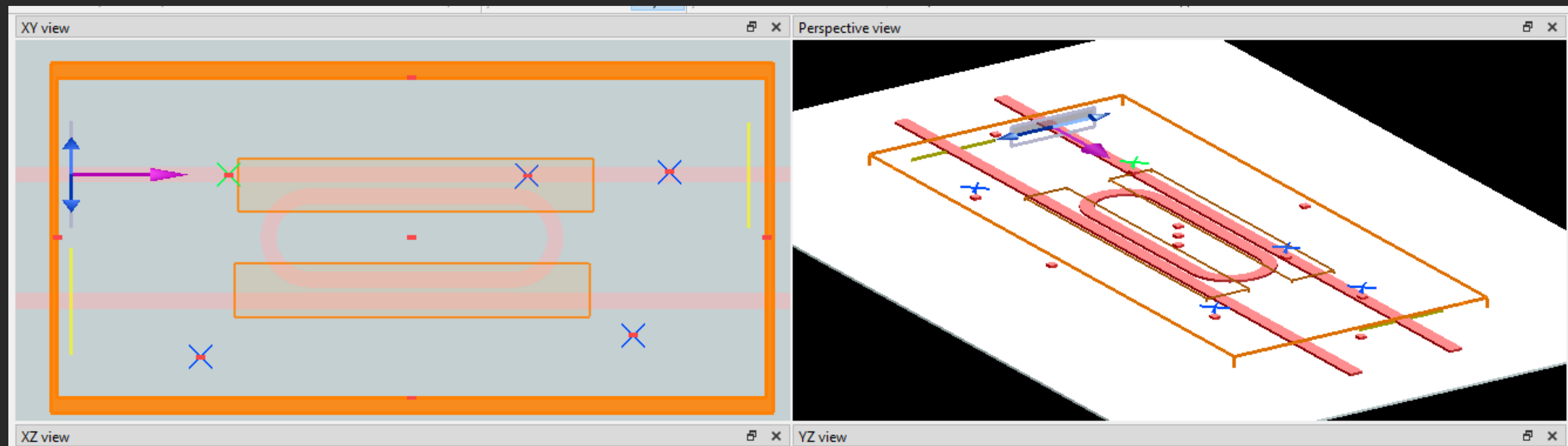
**Comprimento total = 18.85  $\mu\text{m}$**

**Comprimento de acoplamento = 5.74  $\mu\text{m}$**

**Raio = 1.17  $\mu\text{m}$**

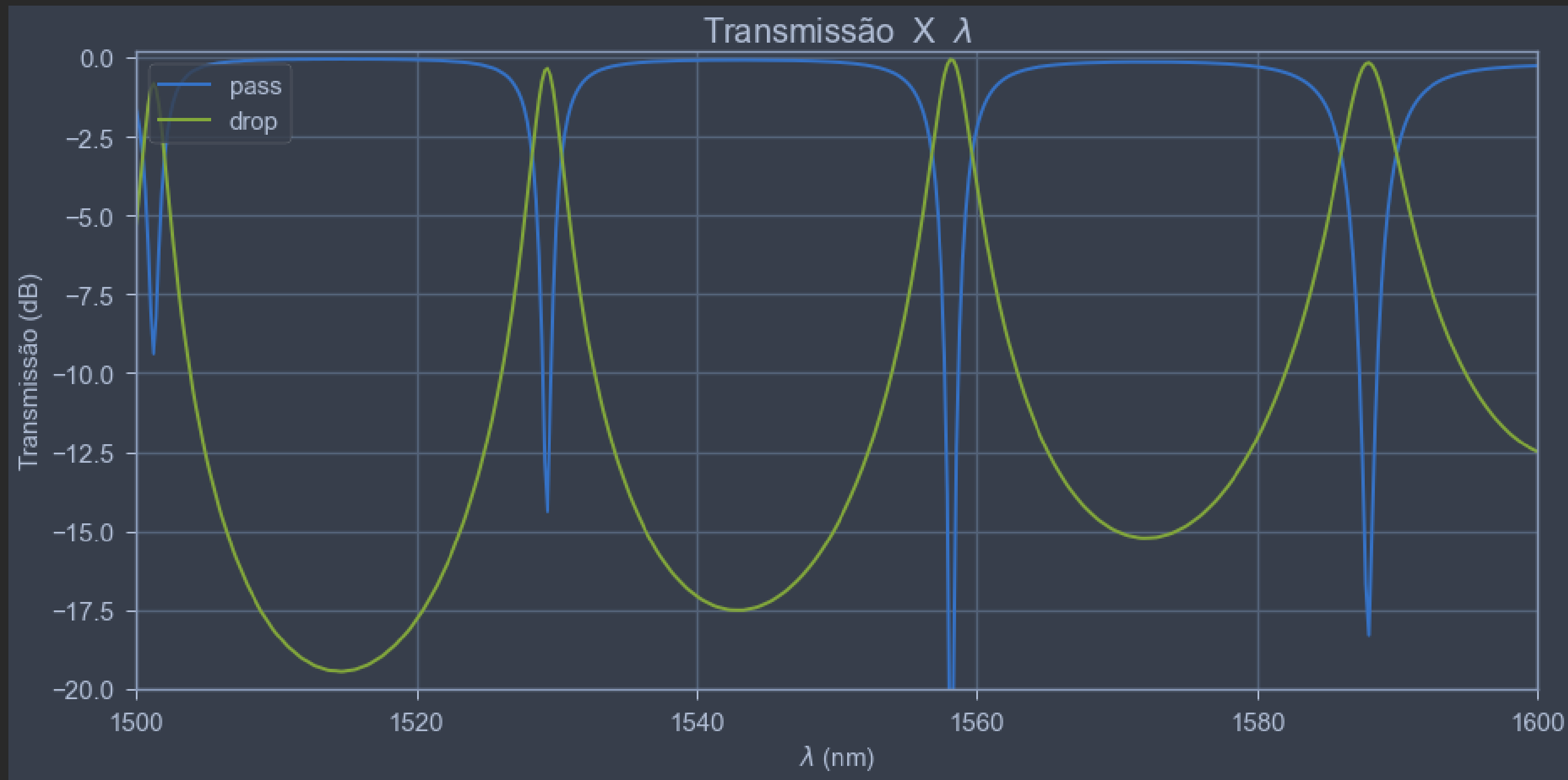
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação



# DESIGN DE UM ANEL DE RESSONÂNCIA

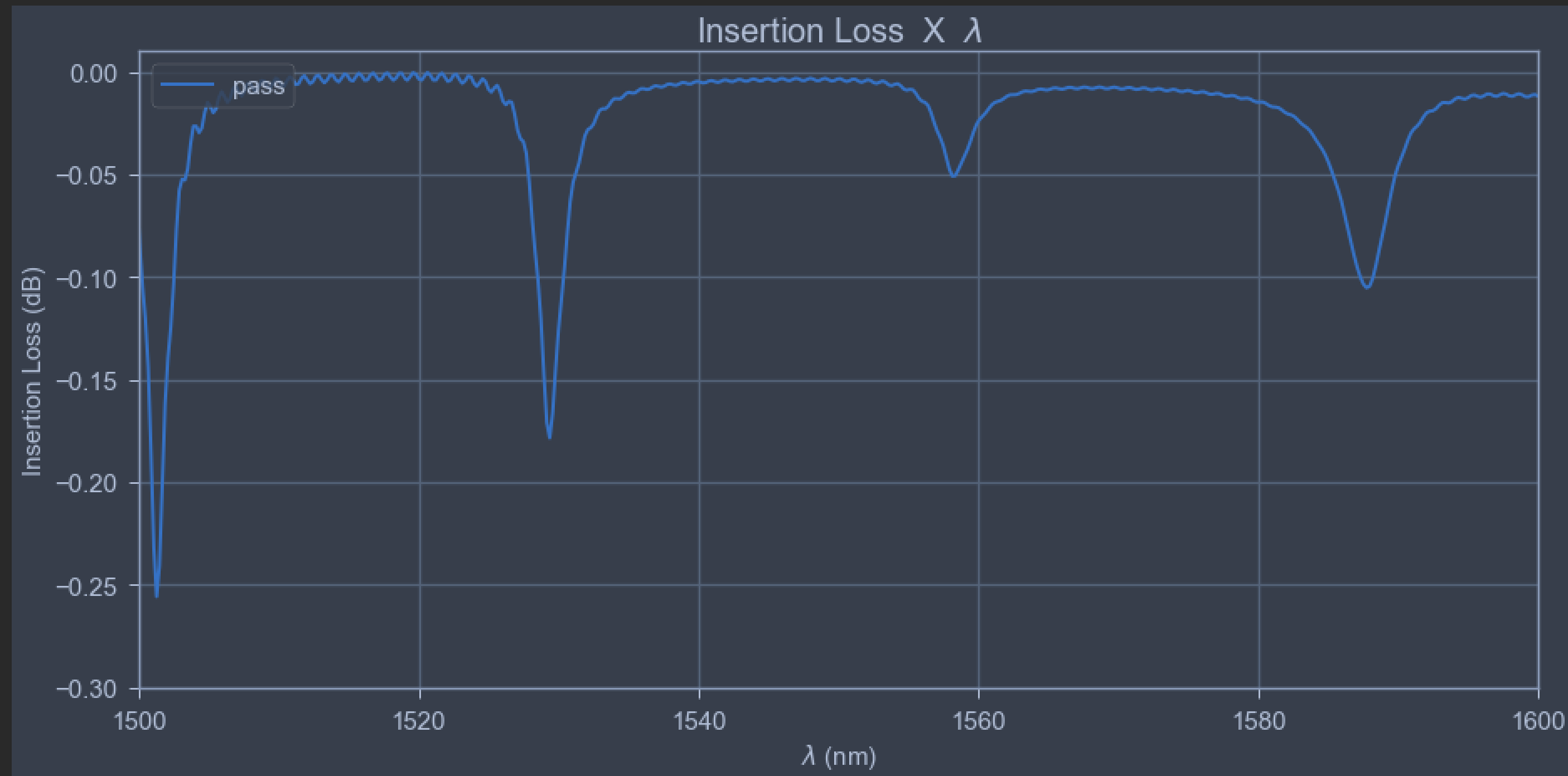
## Resultados





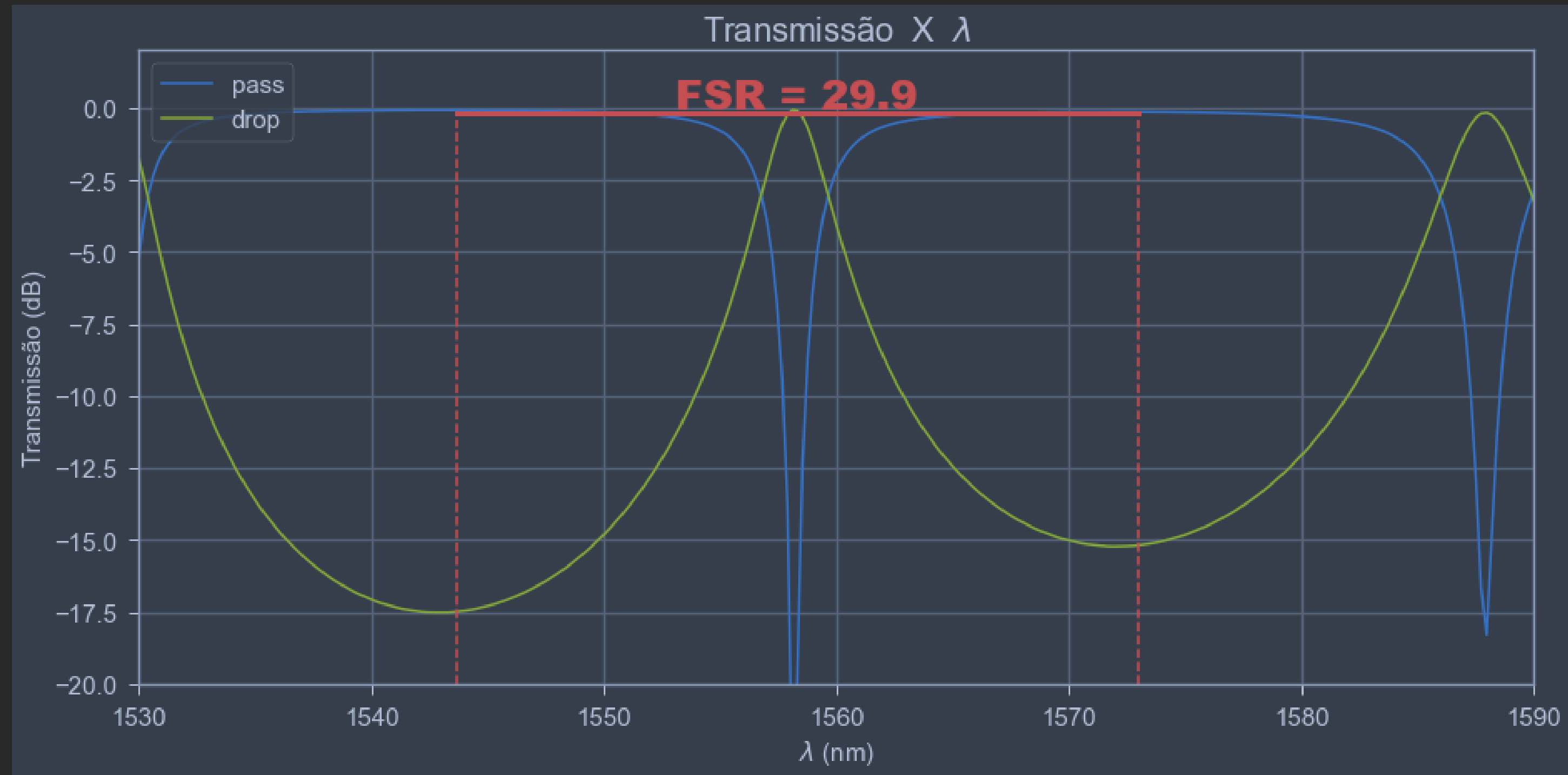
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



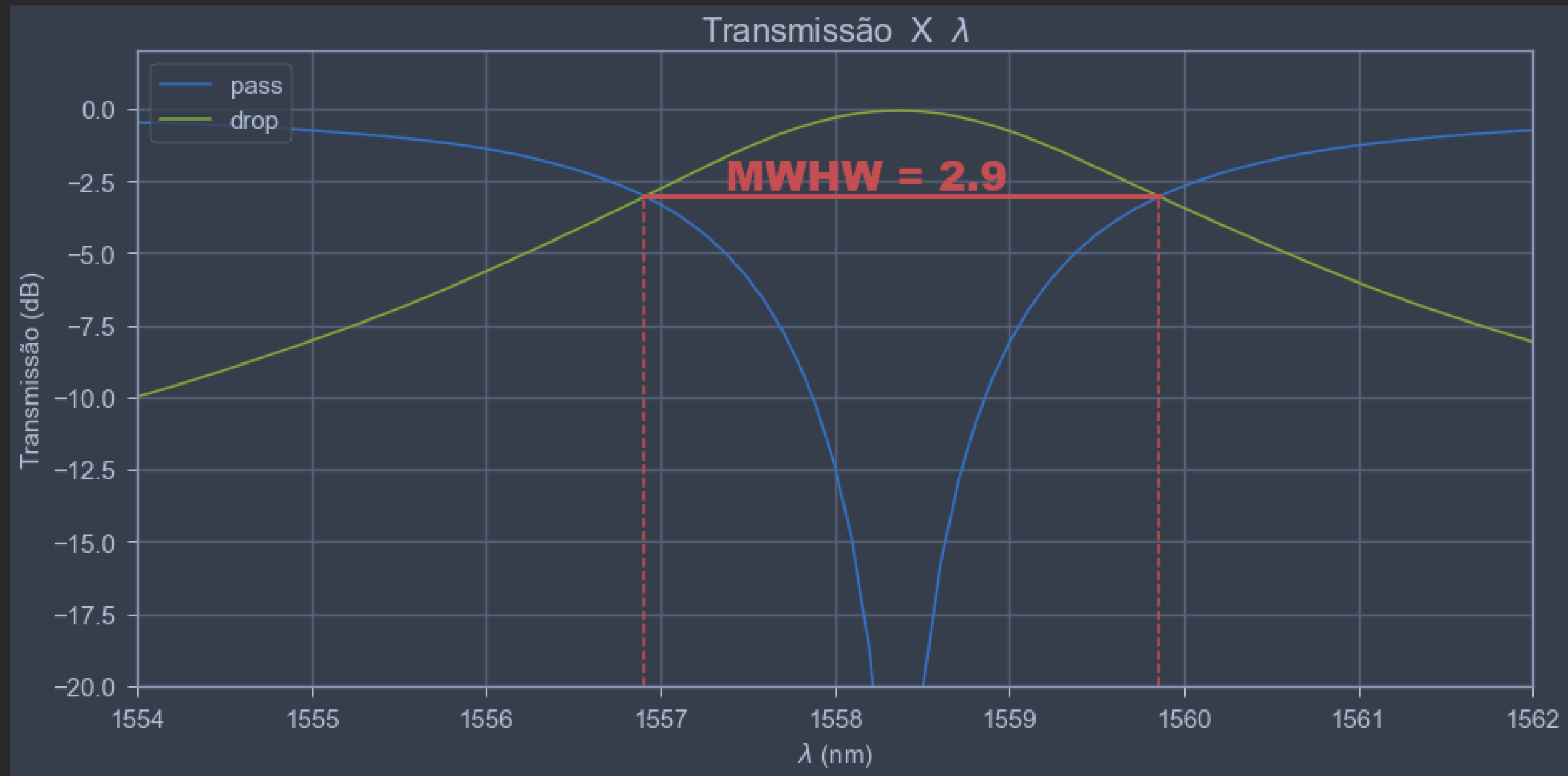
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



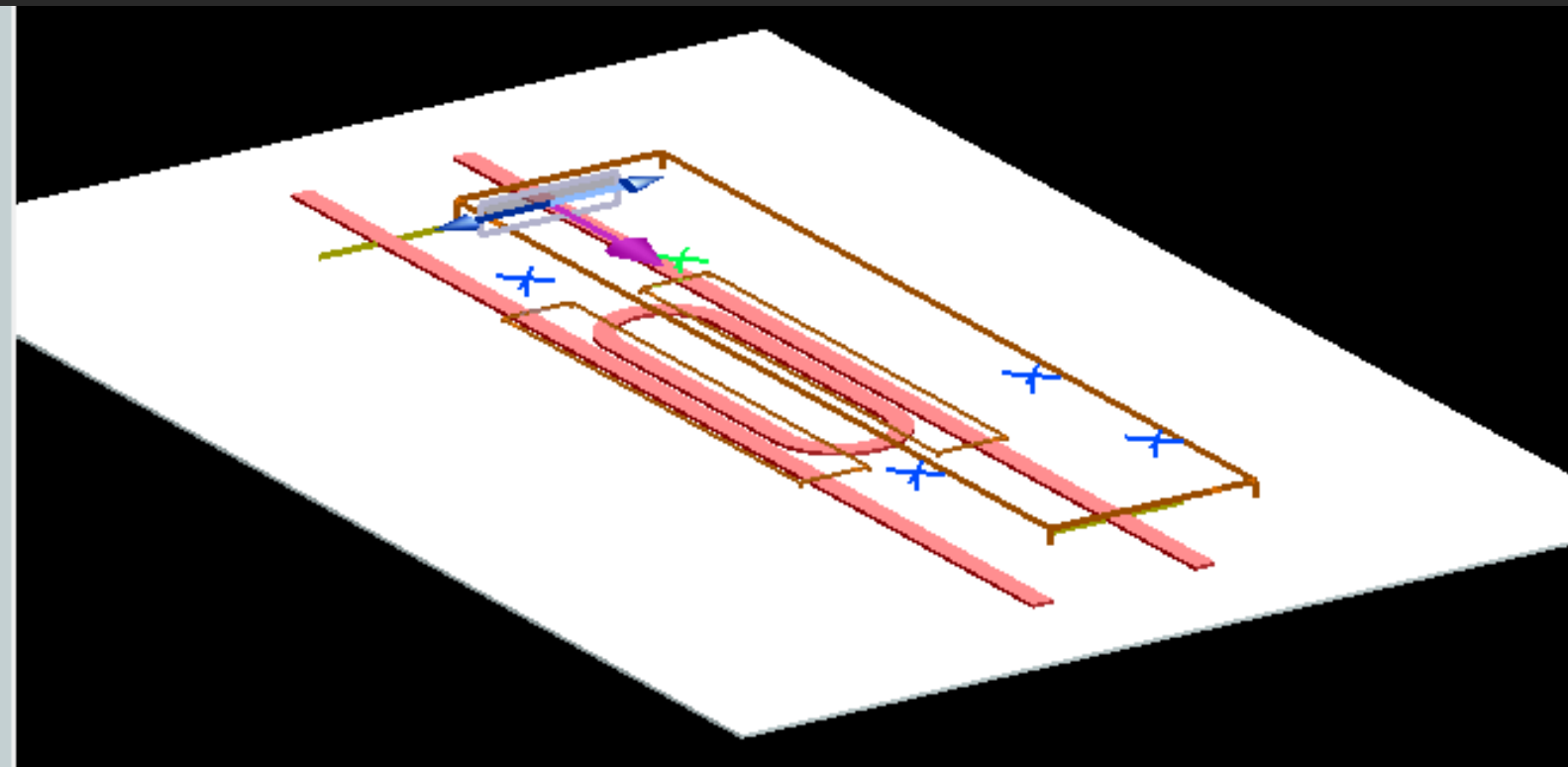
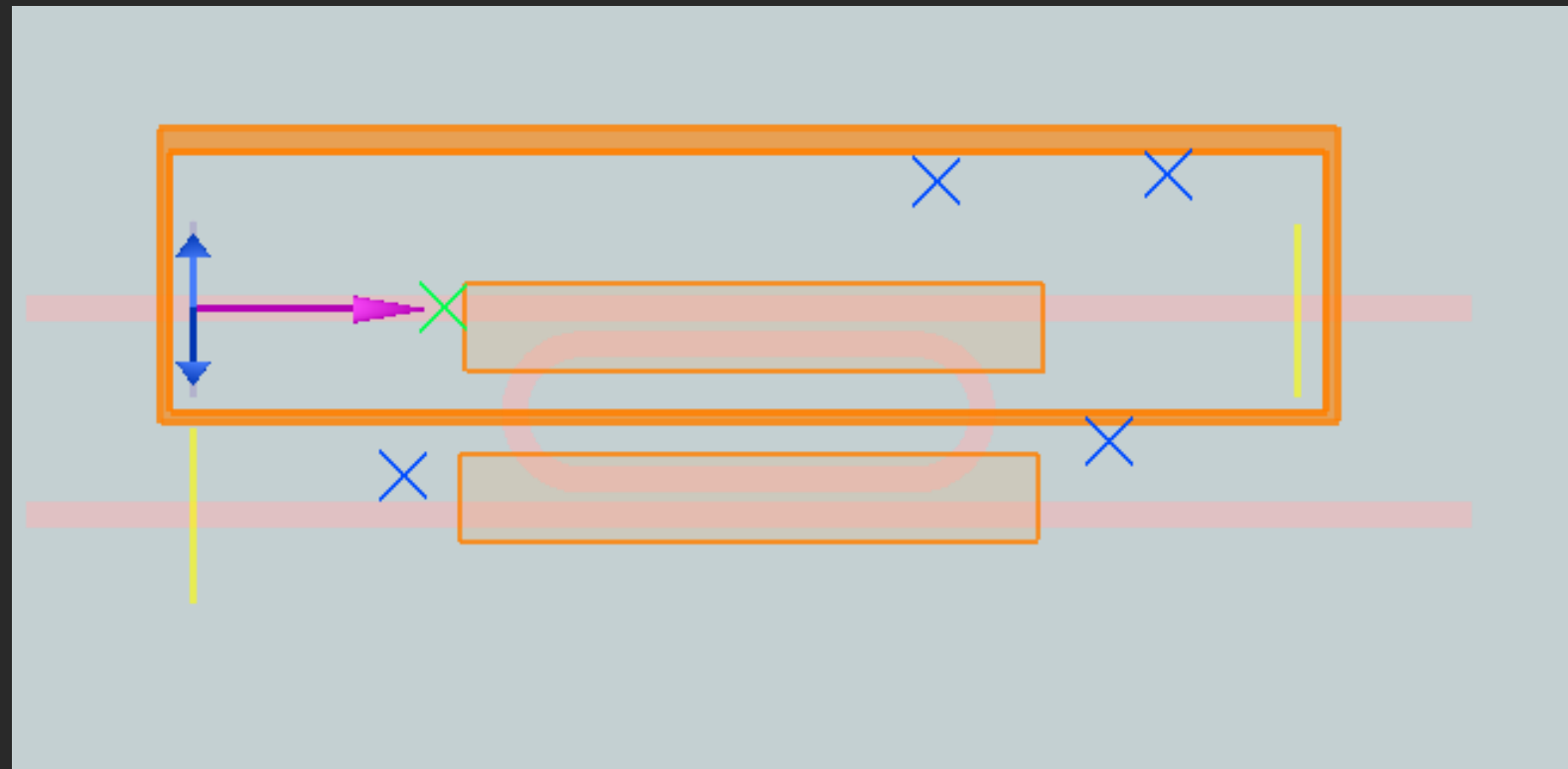
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



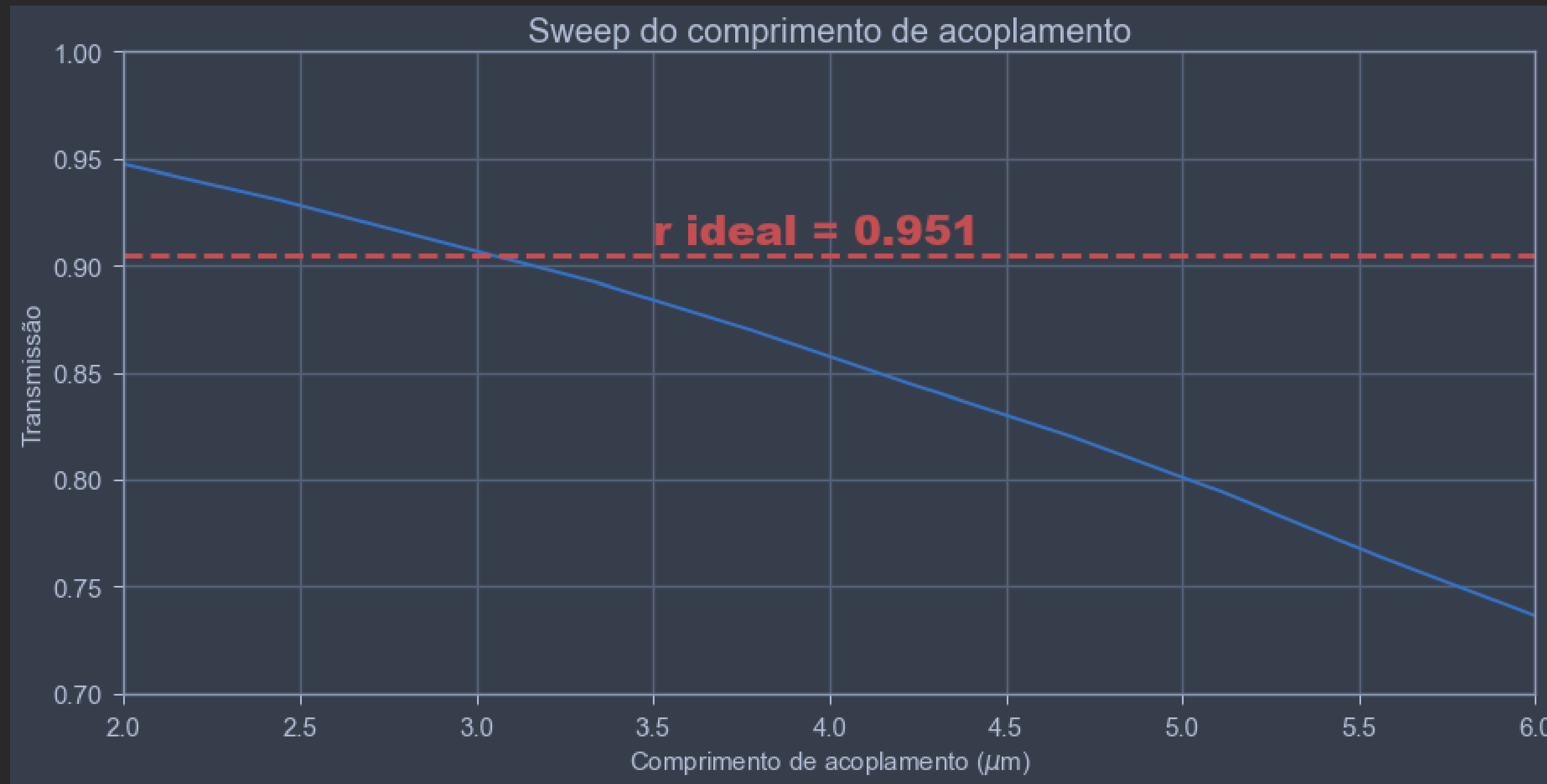
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Sweep comprimento de acoplamento



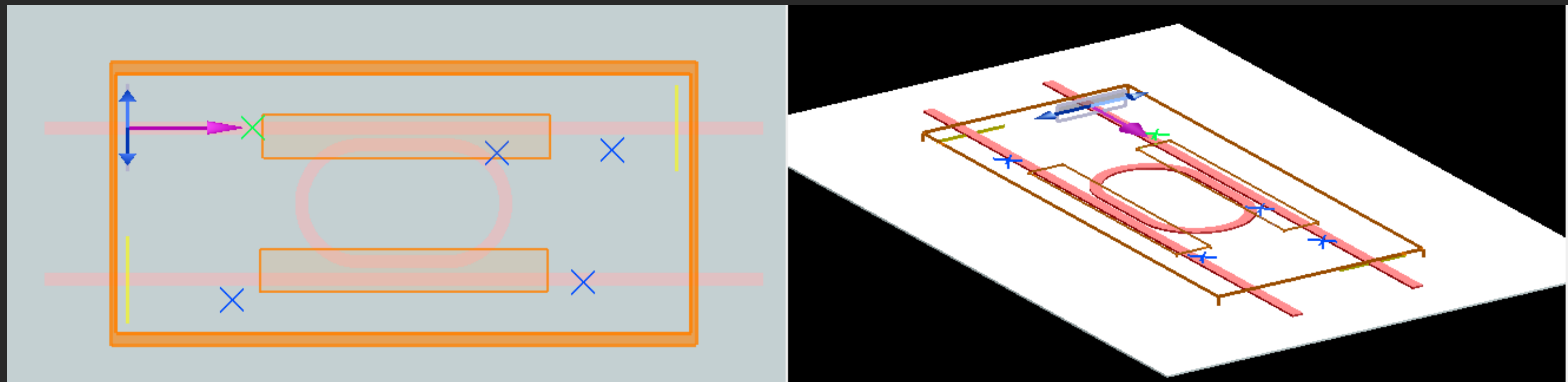
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Sweep comprimento de acoplamento



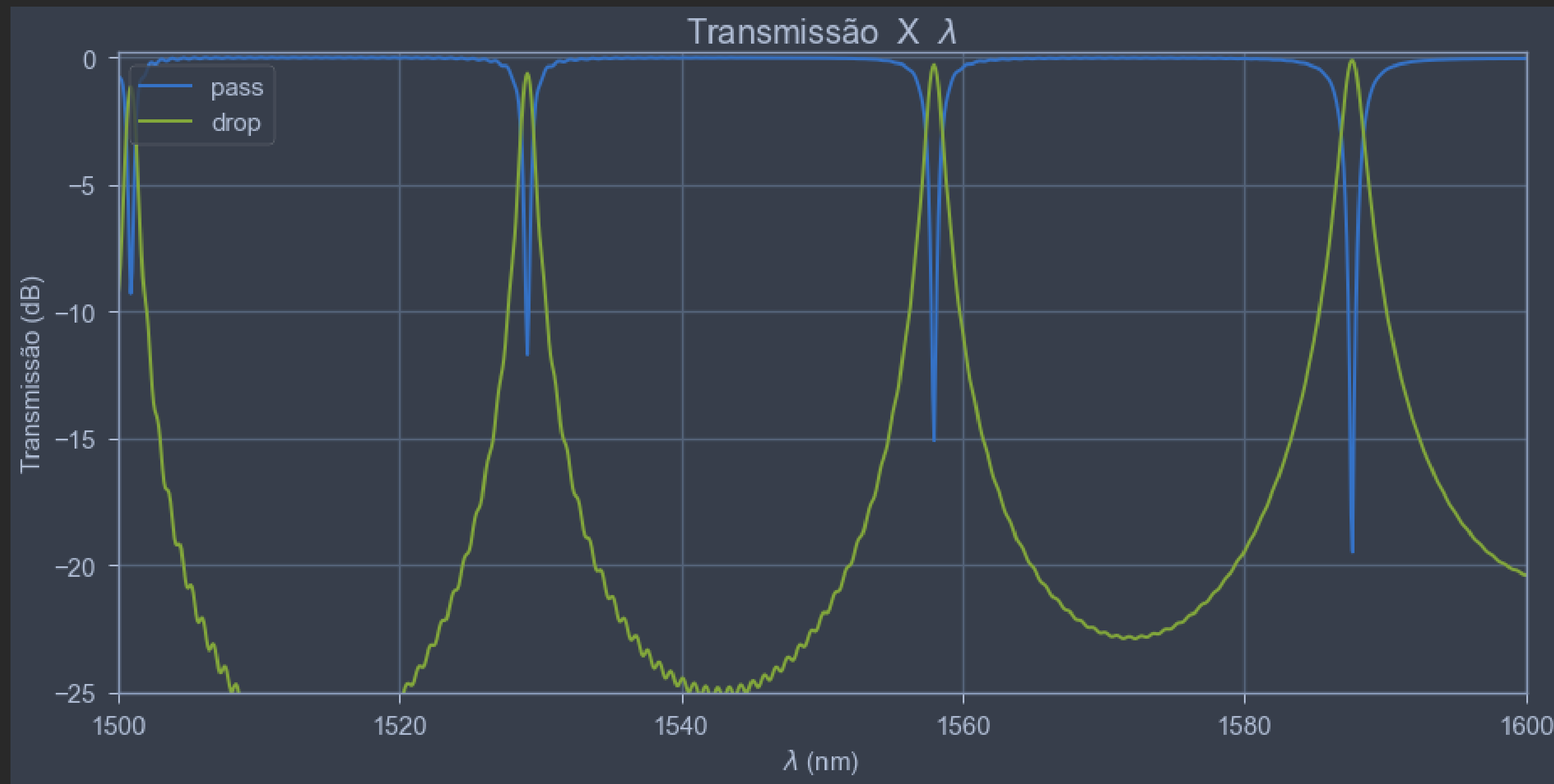
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Usando $L_{\text{acoplamento}} = 3.0.5 \text{ } \mu\text{m}$



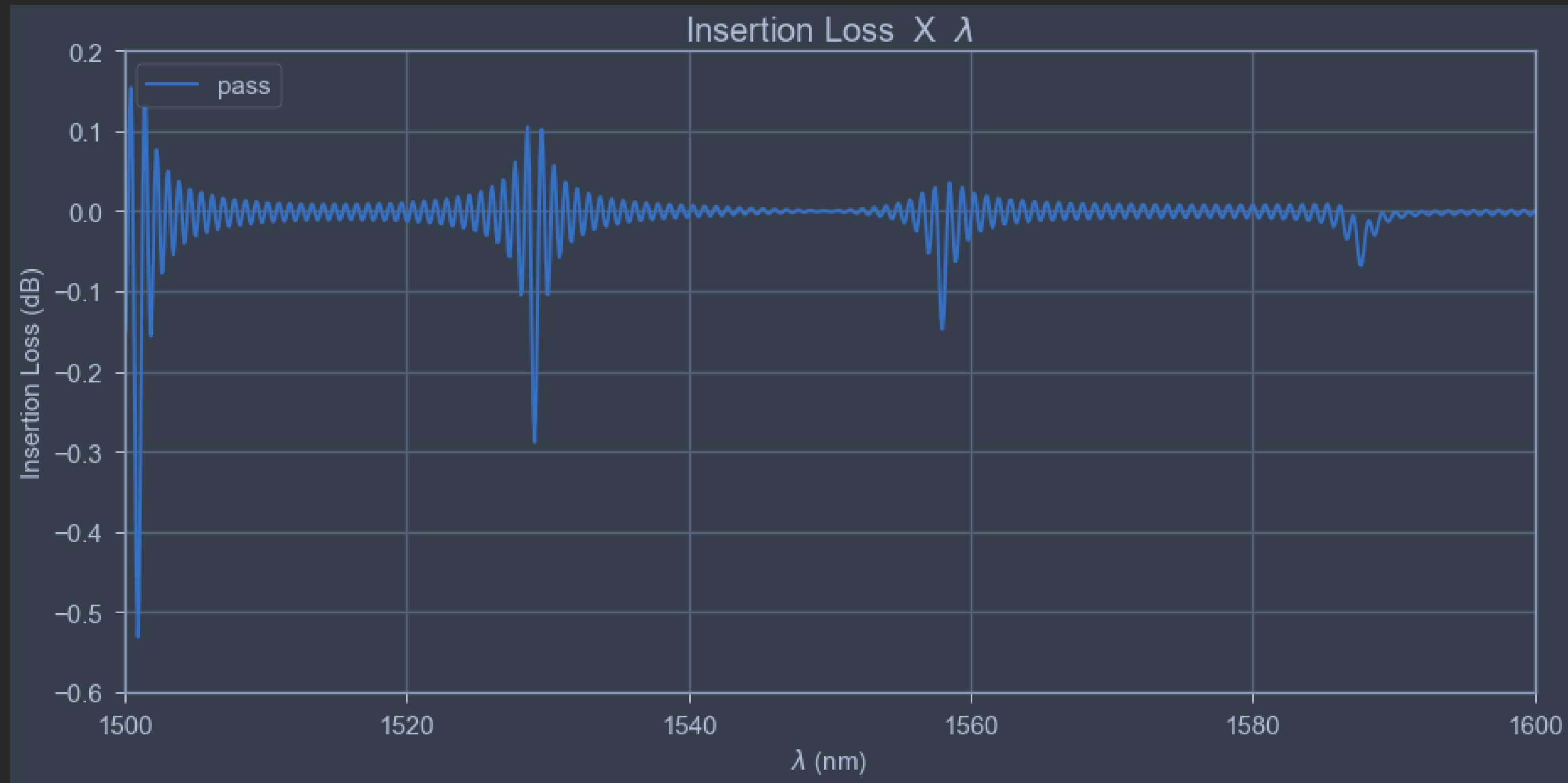
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

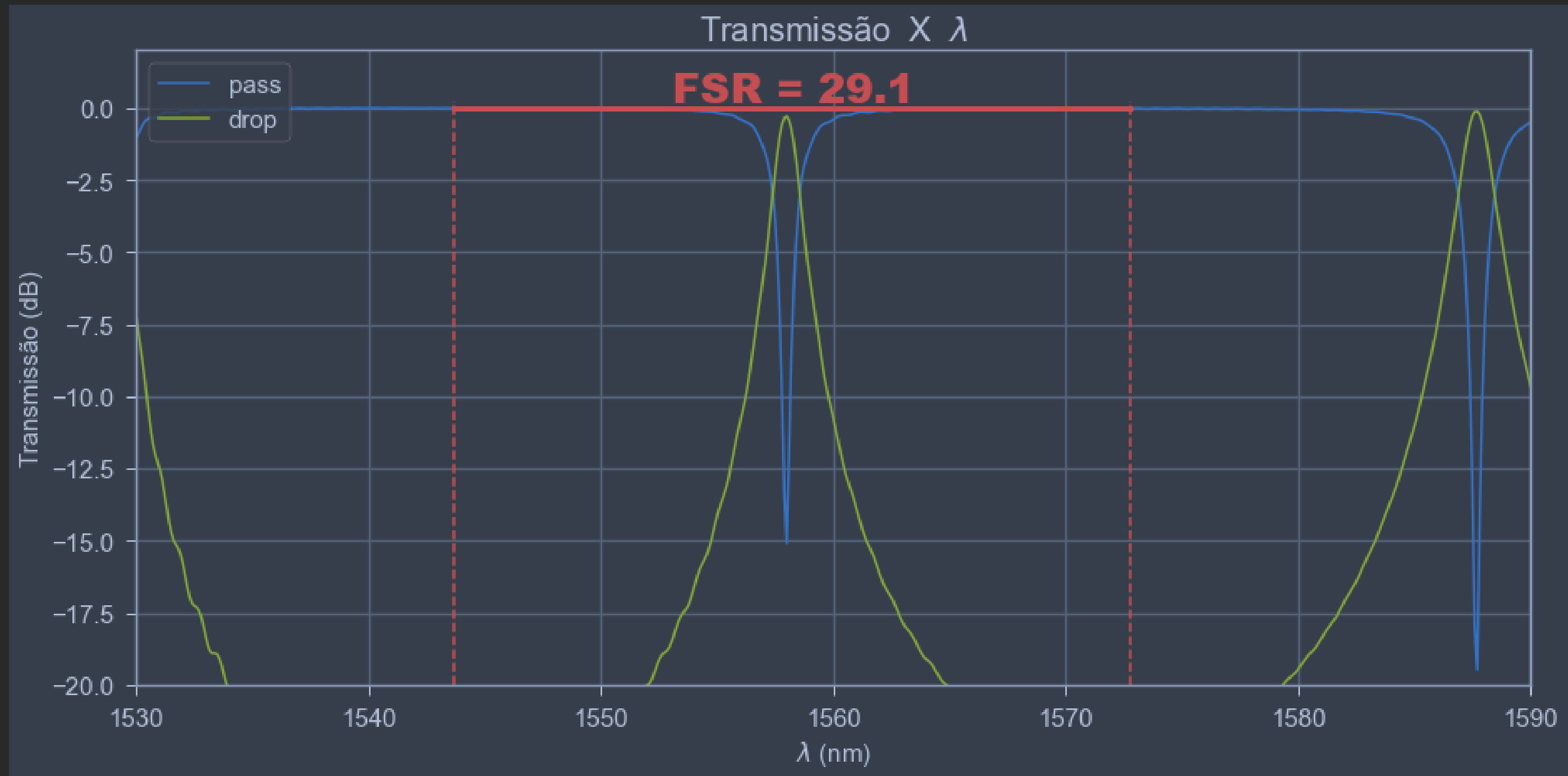
## Resultados





# 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

MWHW = 0.2 nm

SOI in SiO<sub>2</sub>

Guia: 0.45/0.22  $\mu\text{m}$

gap = 150 nm

## Valores Teóricos

Comprimento total = 650.82  $\mu\text{m}$

Comprimento de acoplamento = 15.13  $\mu\text{m}$

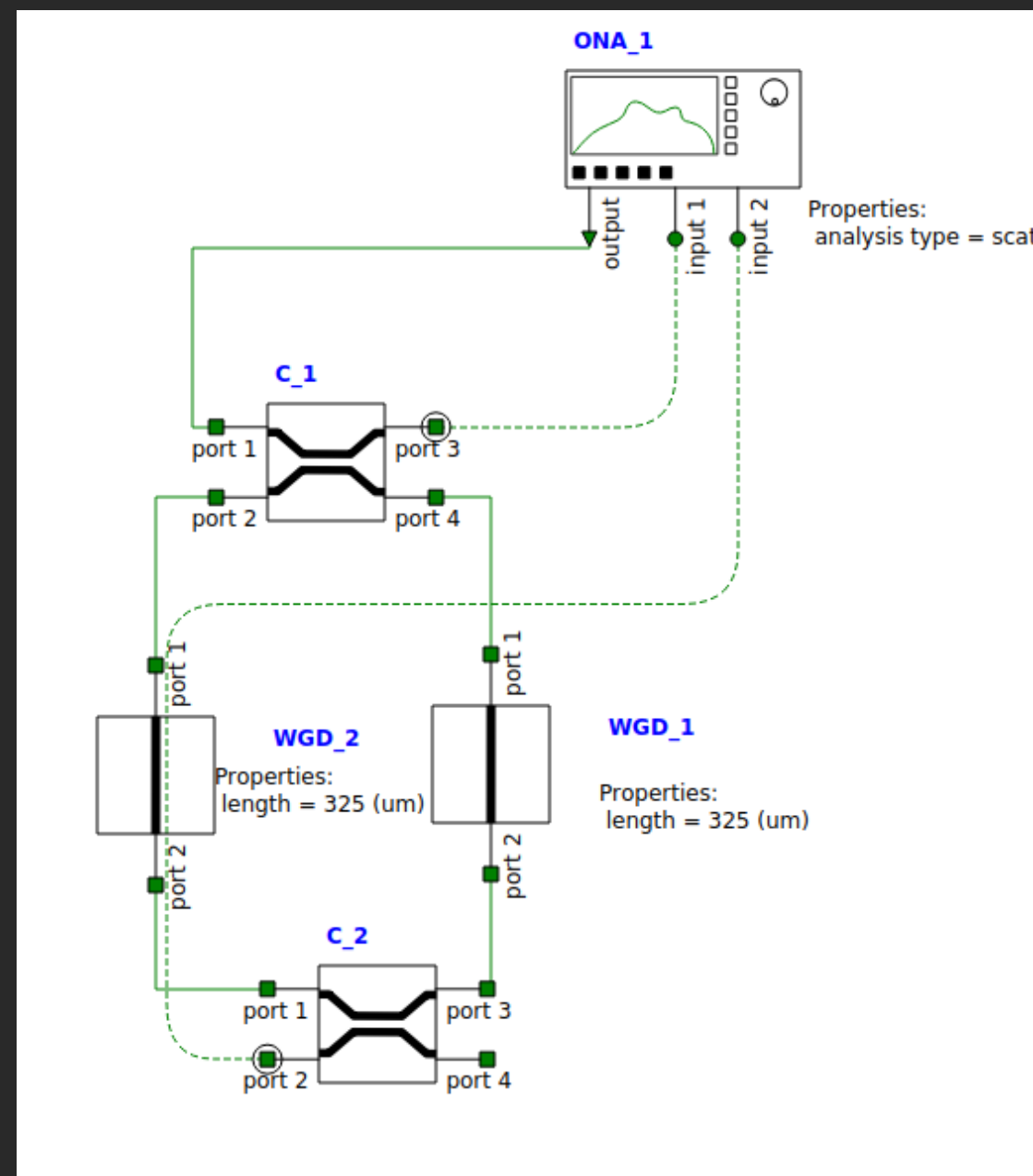
Raio = 98.76  $\mu\text{m}$

Q factor = 7749

Finesse = 4

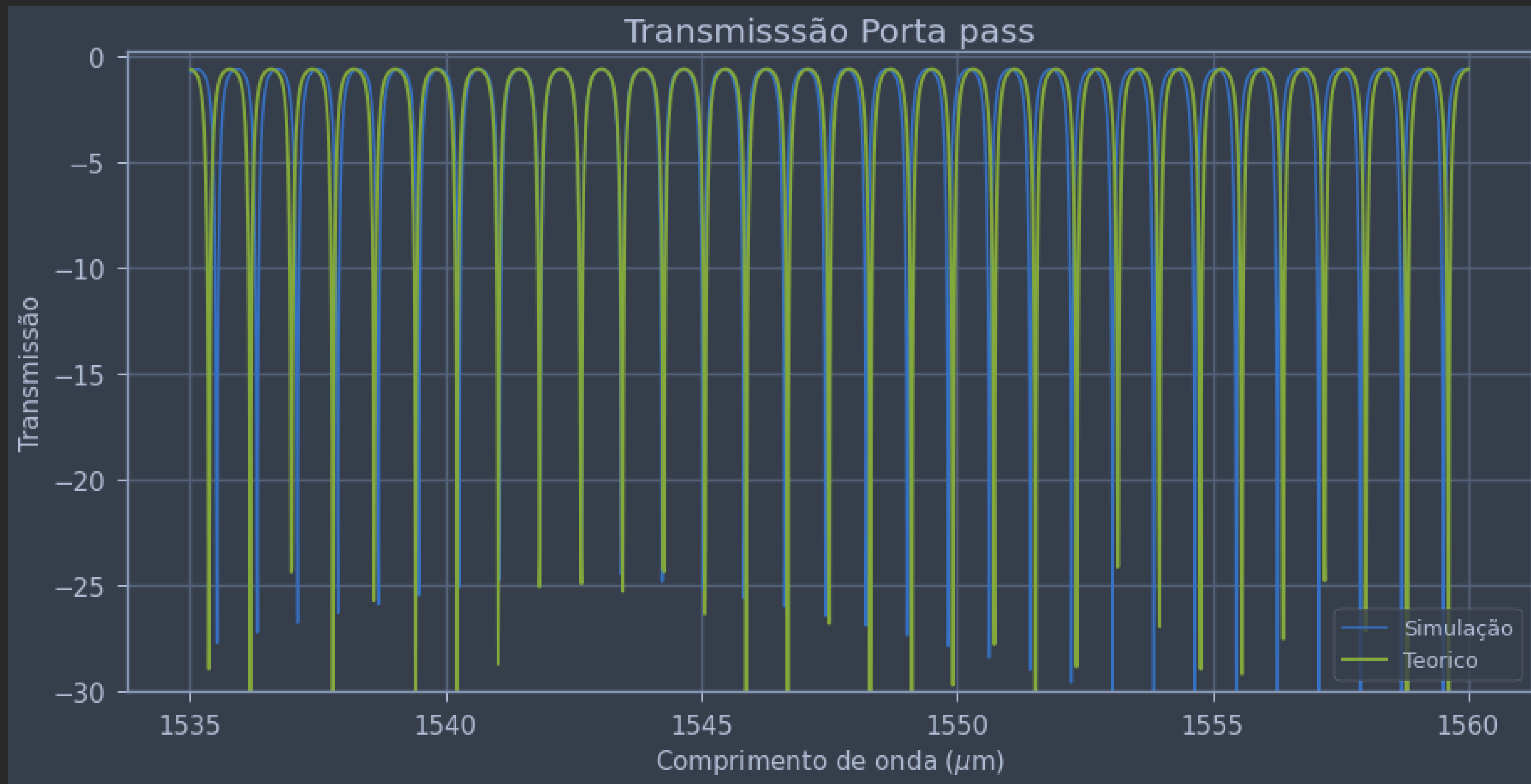
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação no Interconnect



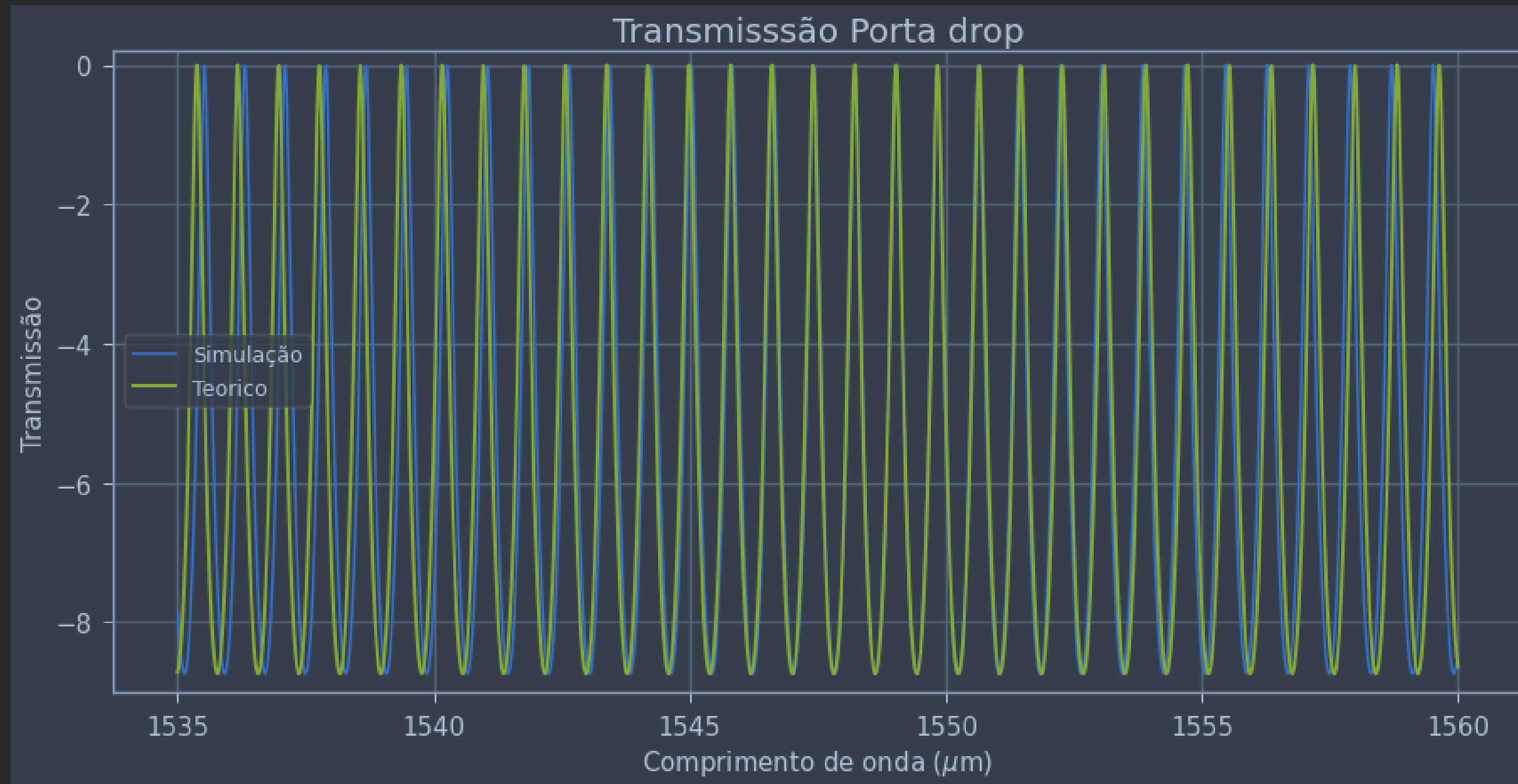
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



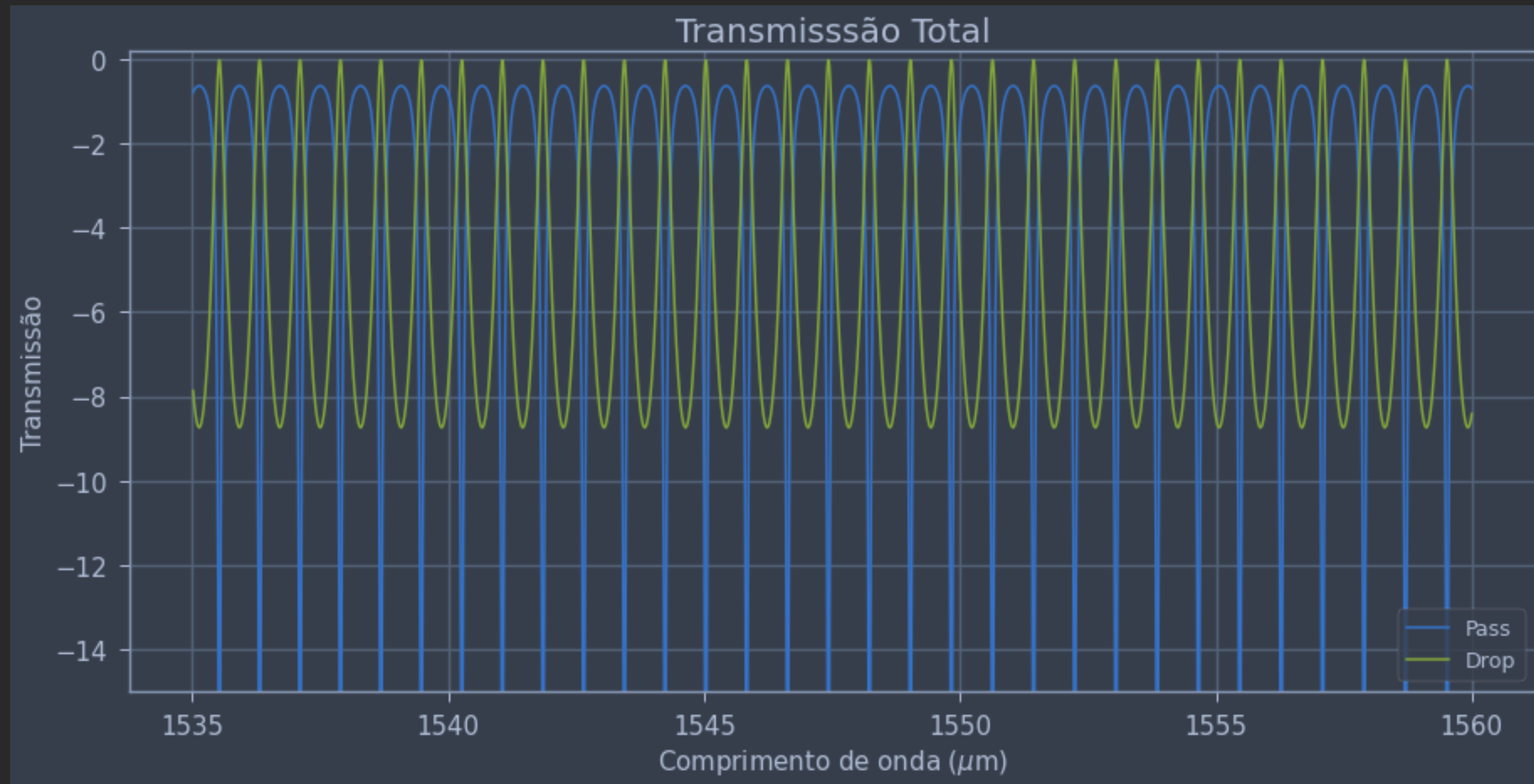
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

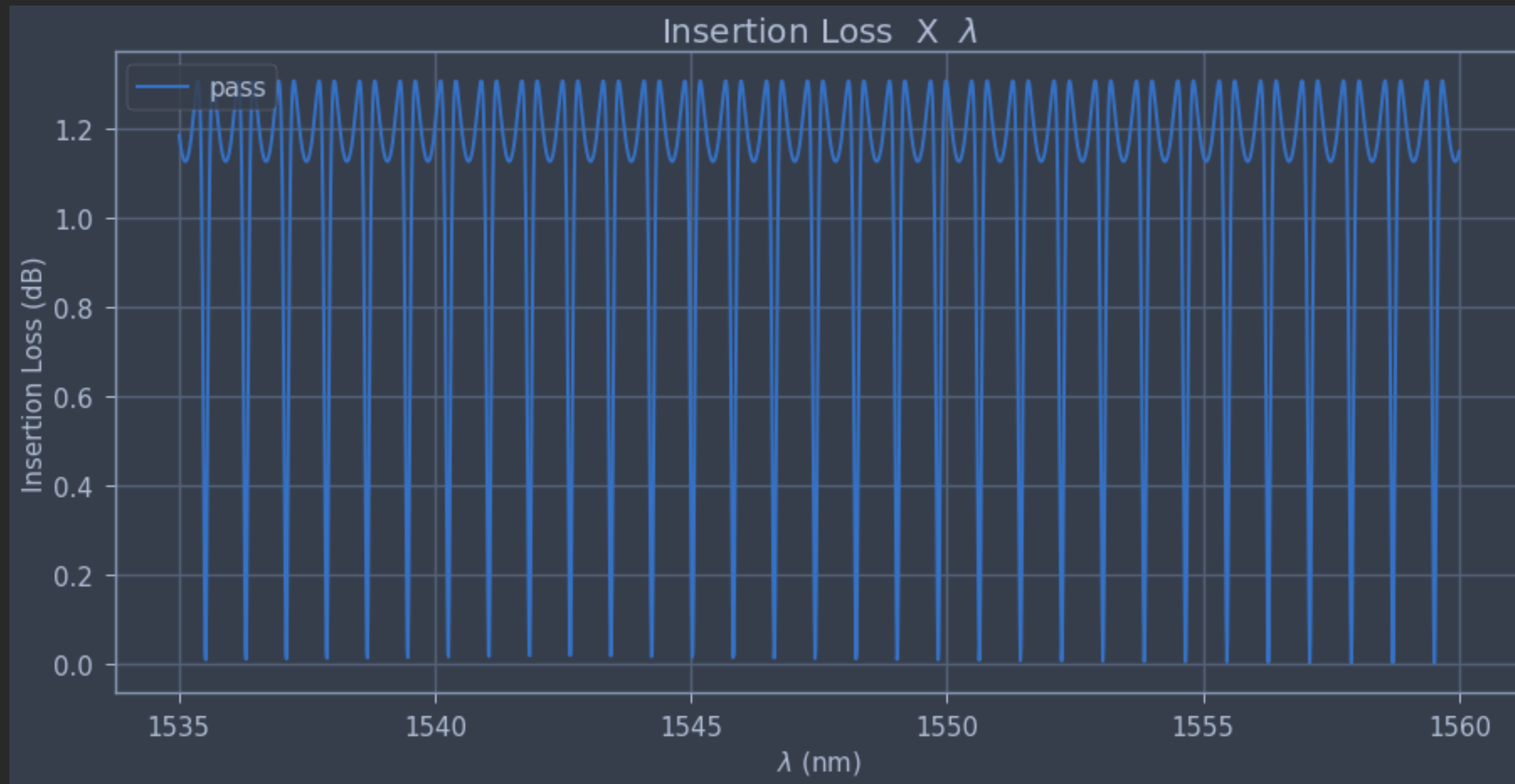
## Resultados





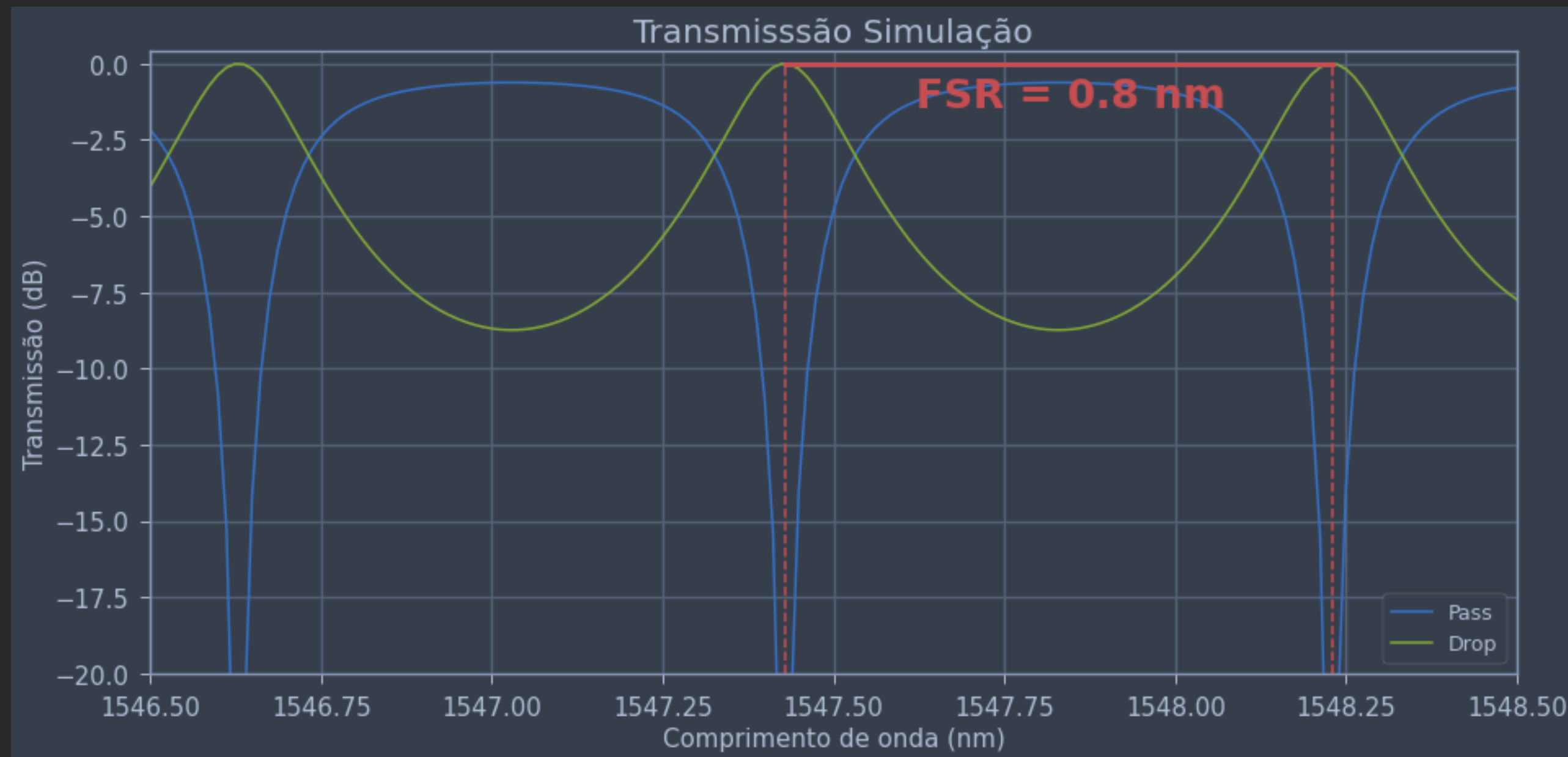
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



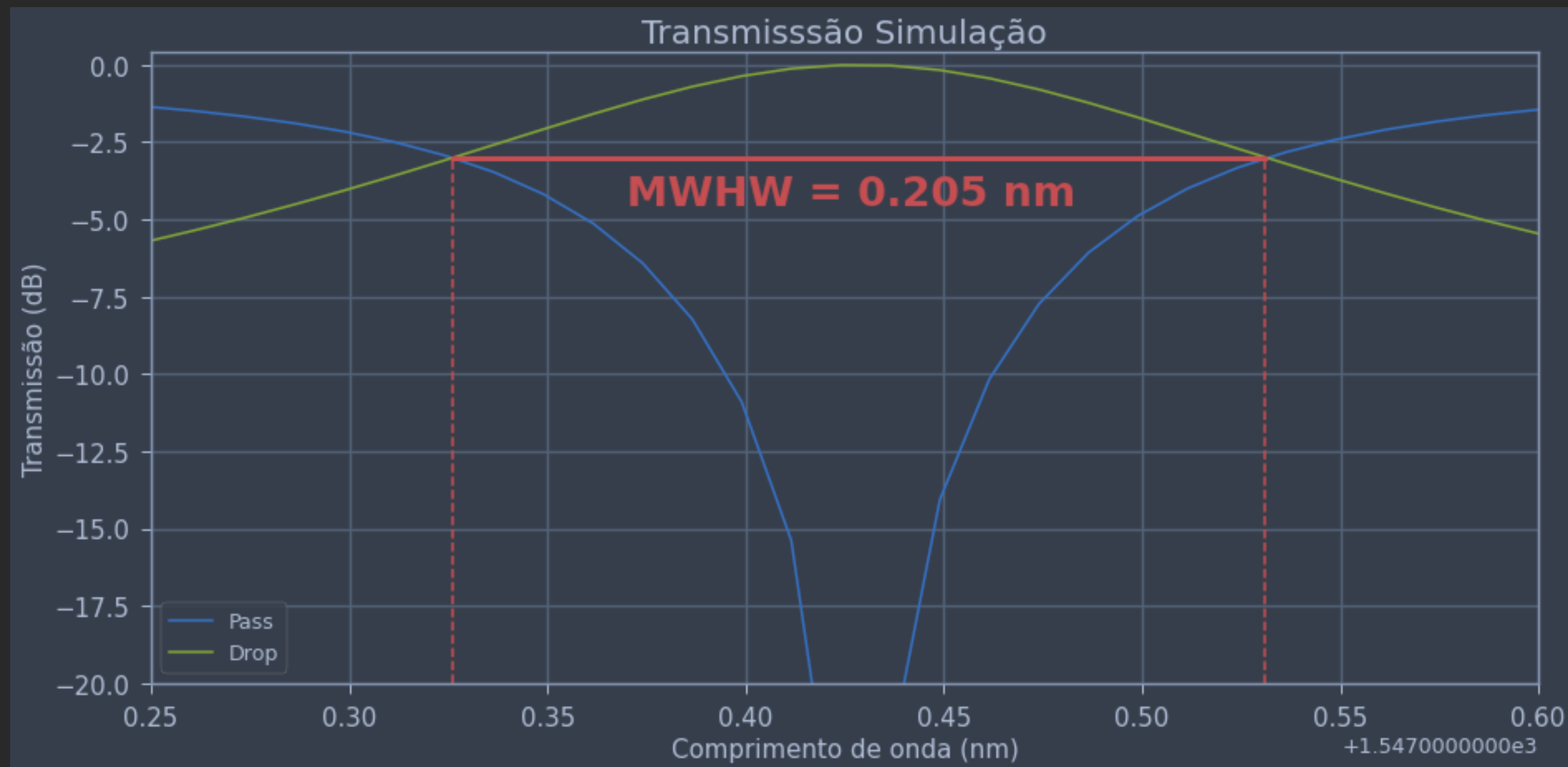
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



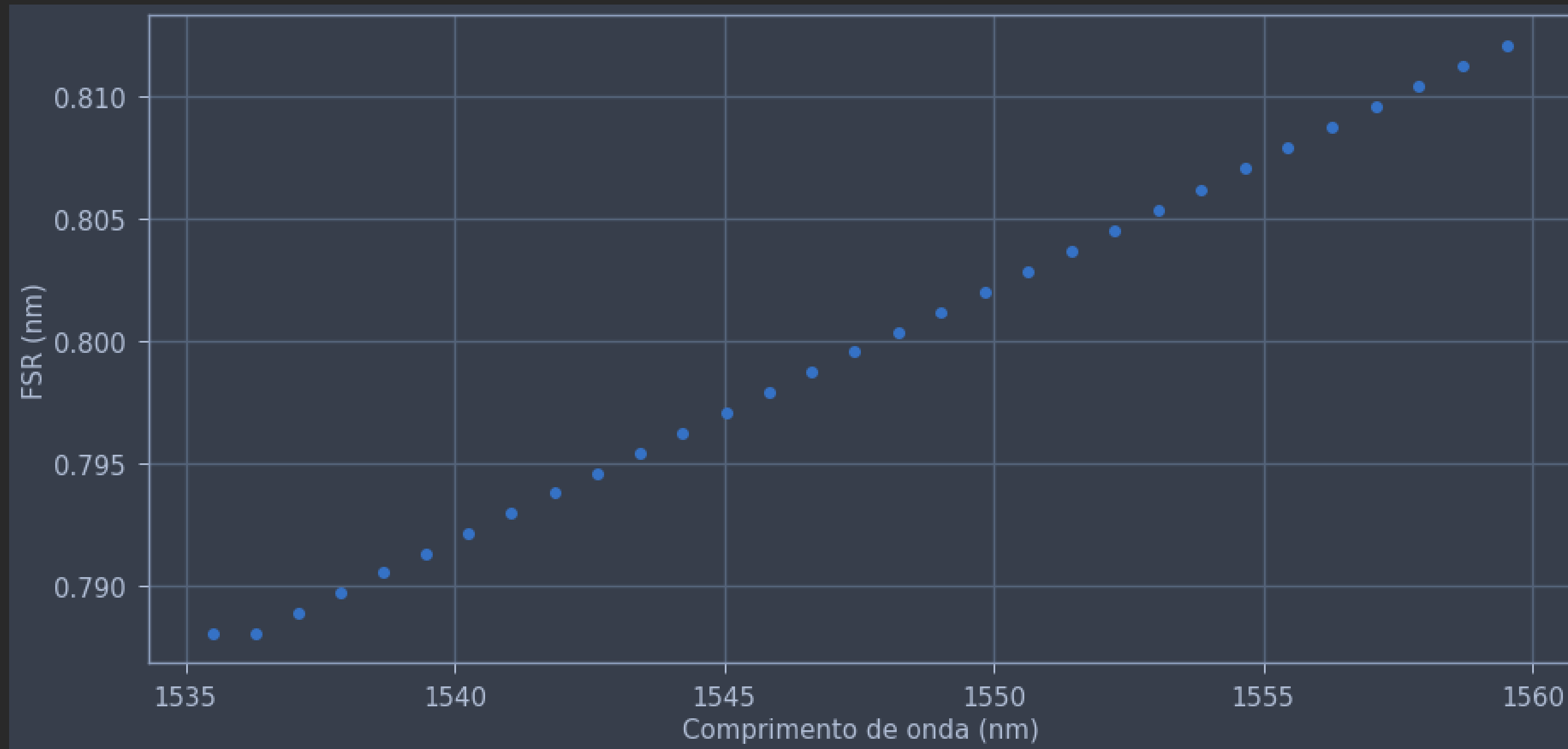
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



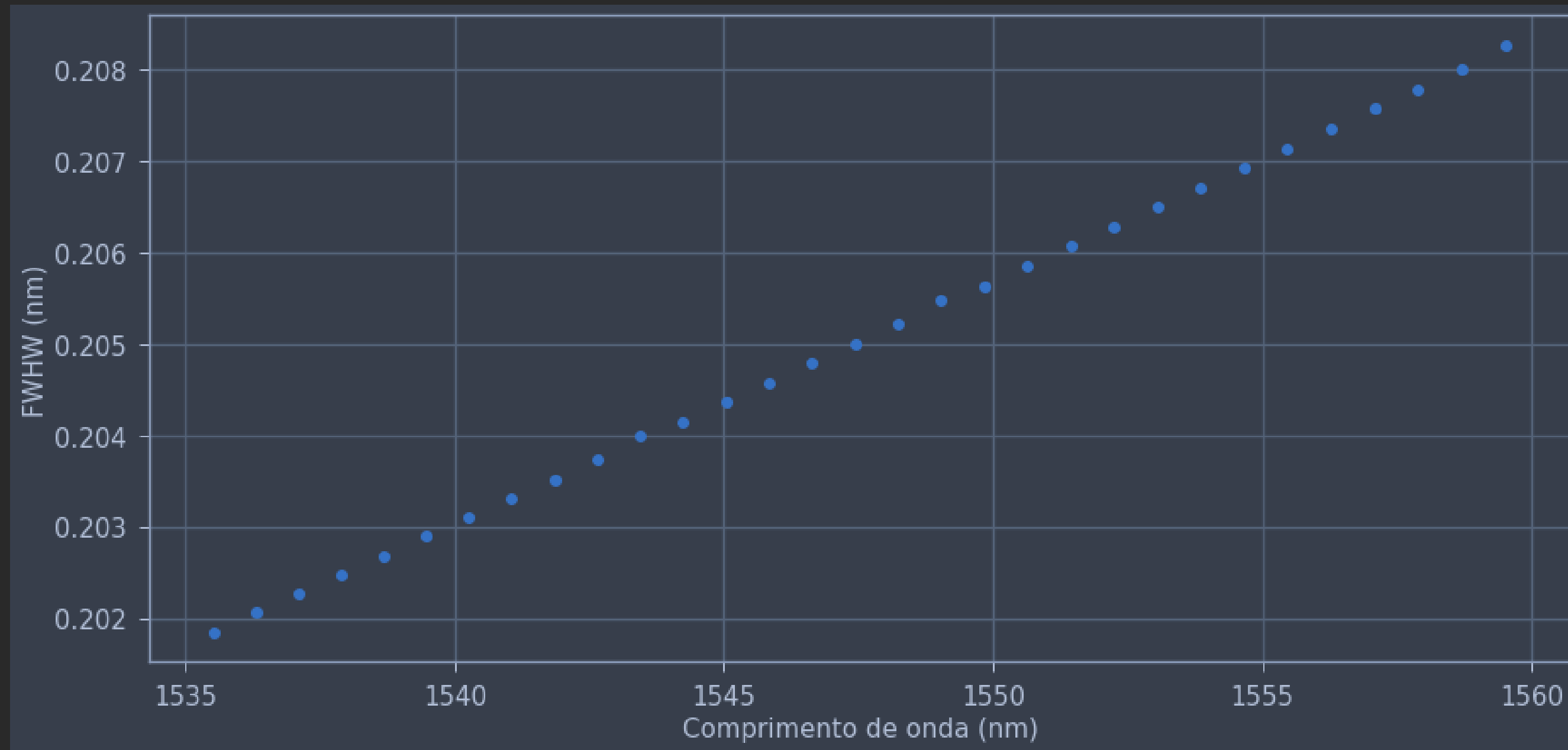
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



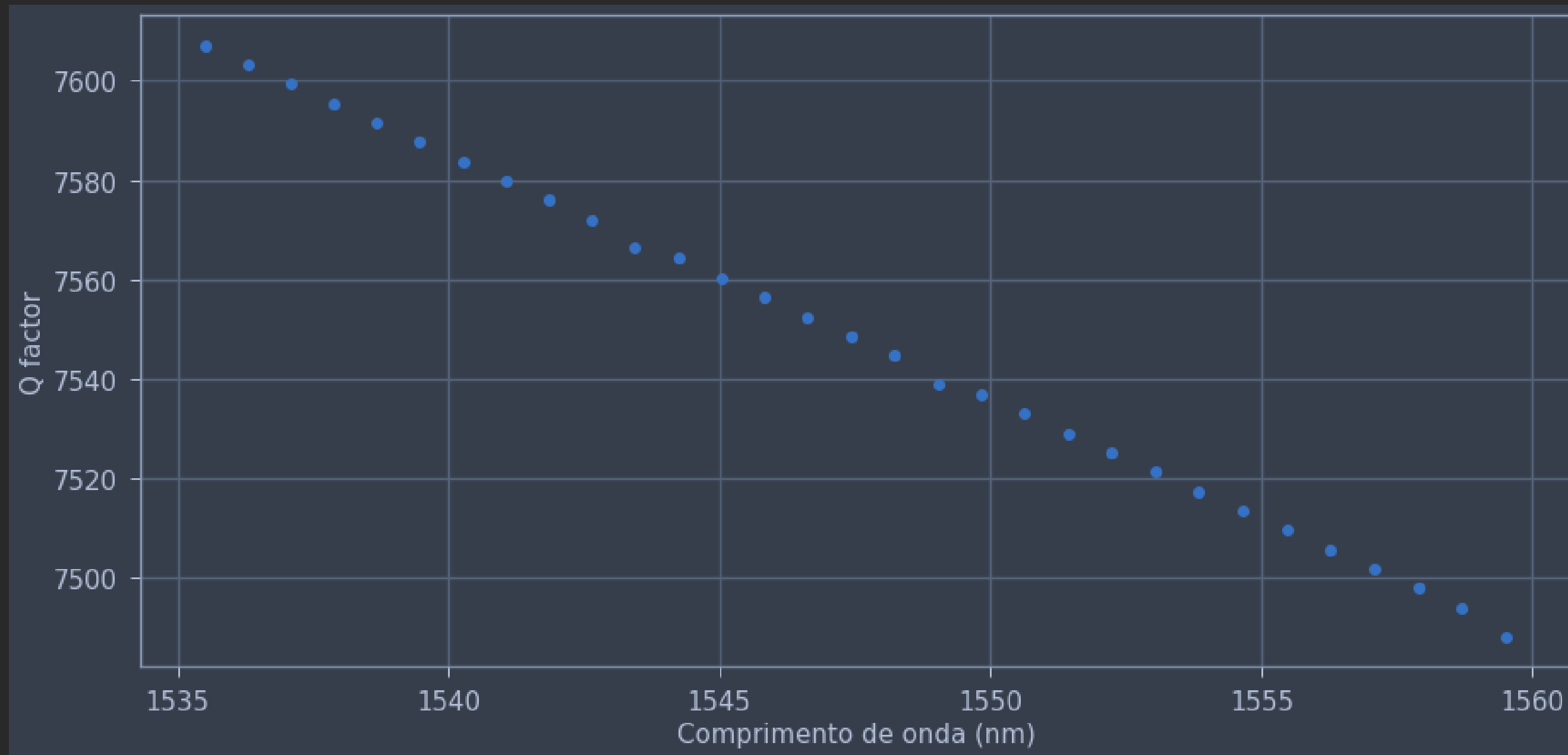
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



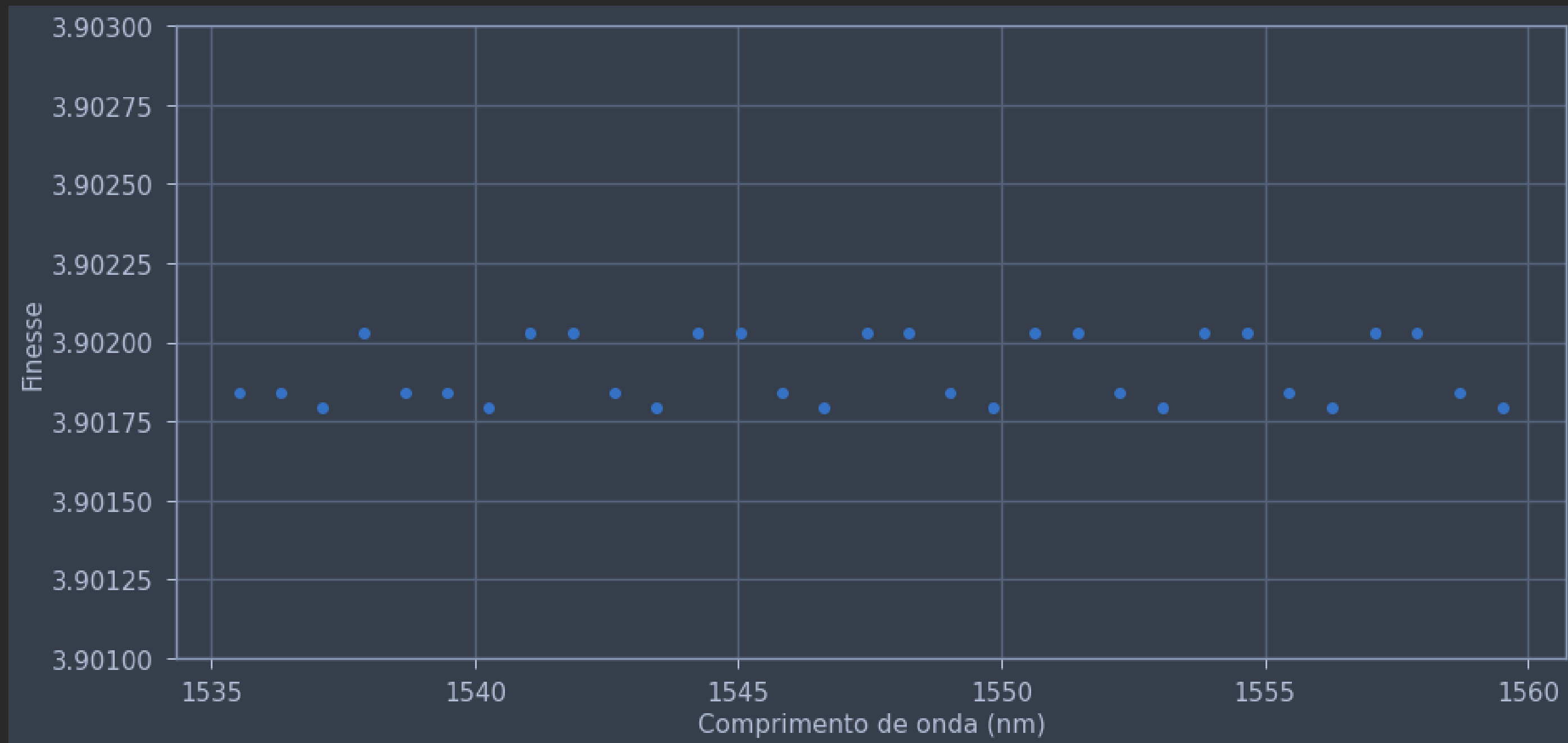
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

Analise do acoplamento

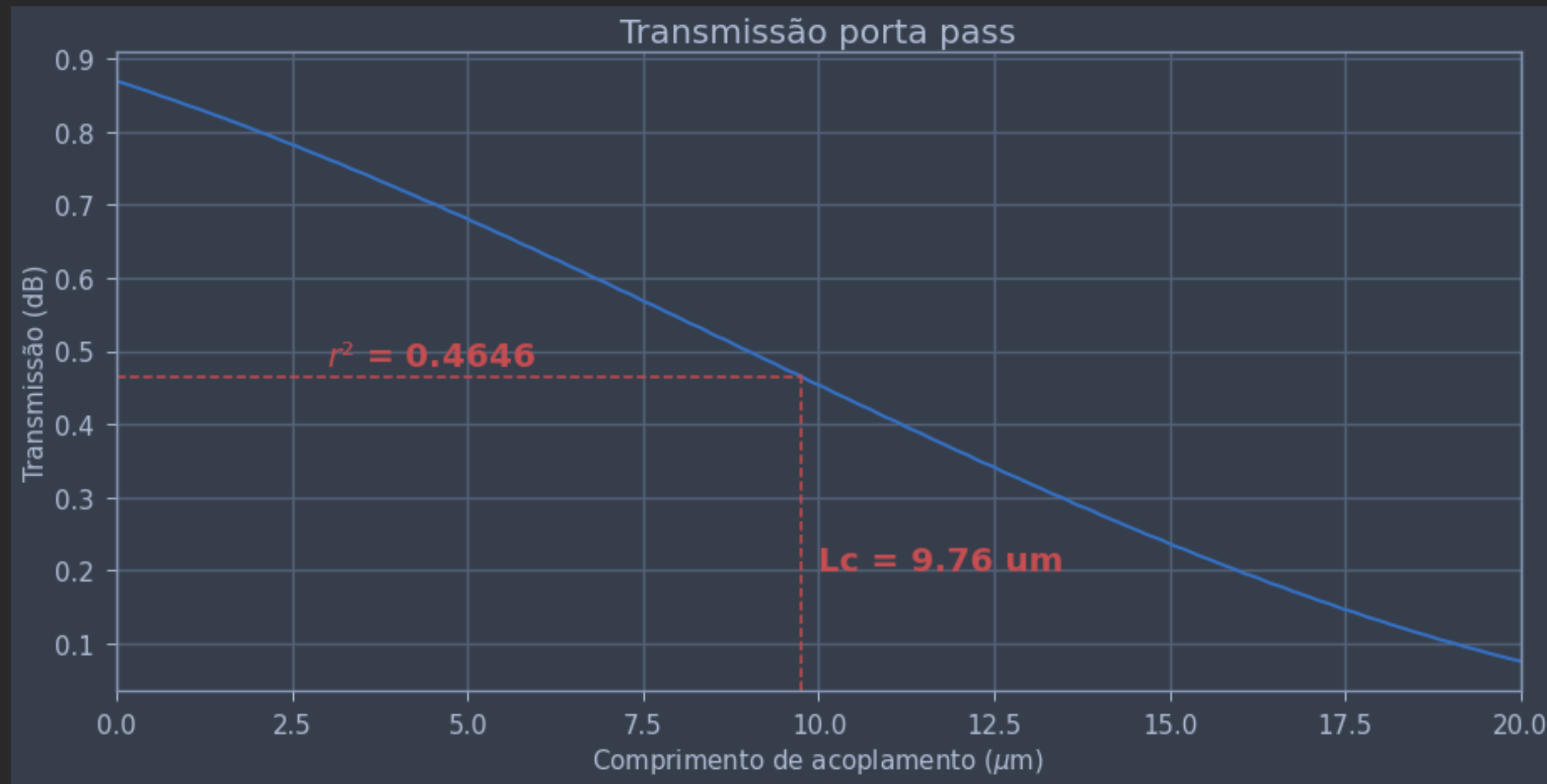
Solver usado: EME





# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# SEMANA 4

## Simulações no FDTD

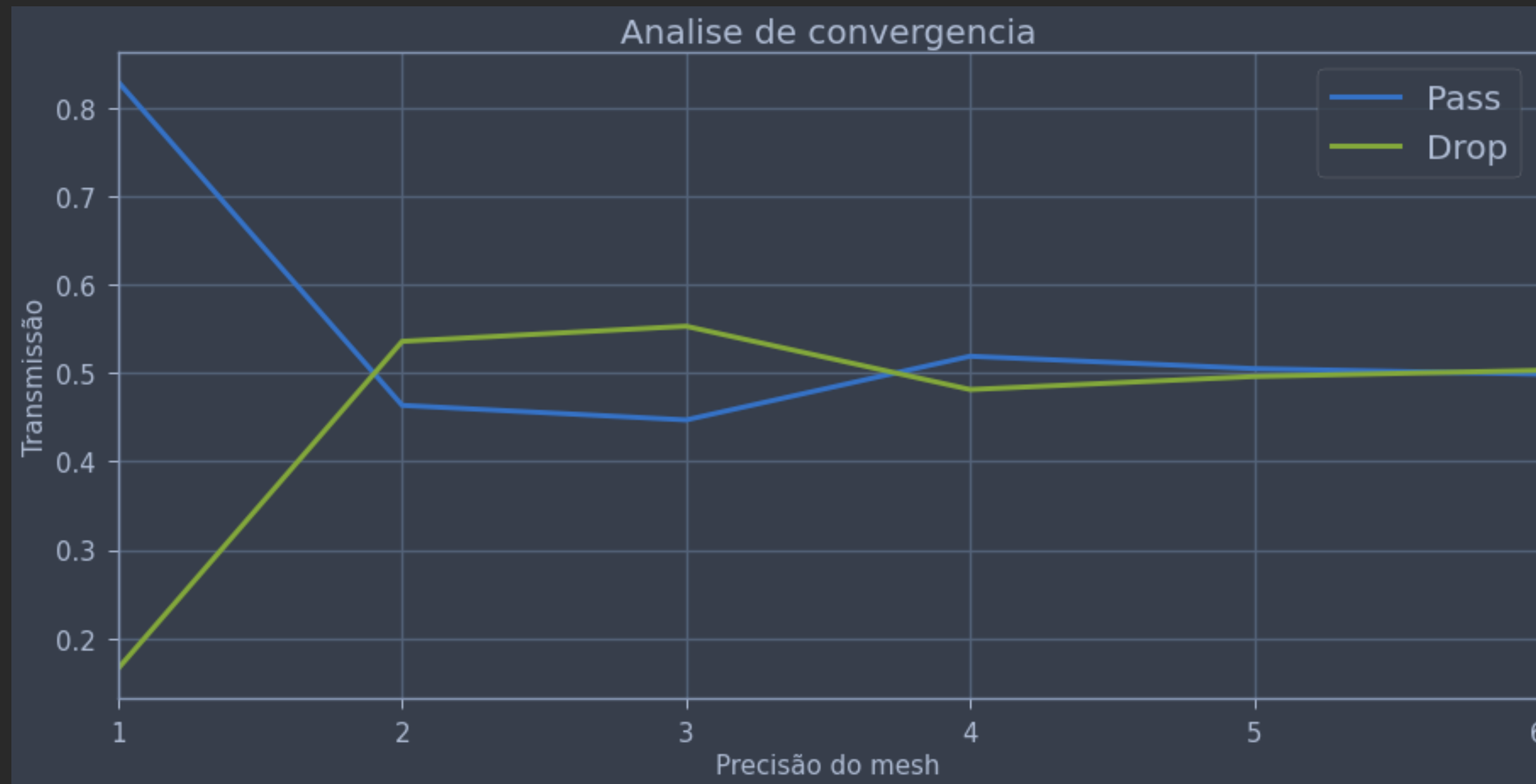
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação dos componentes



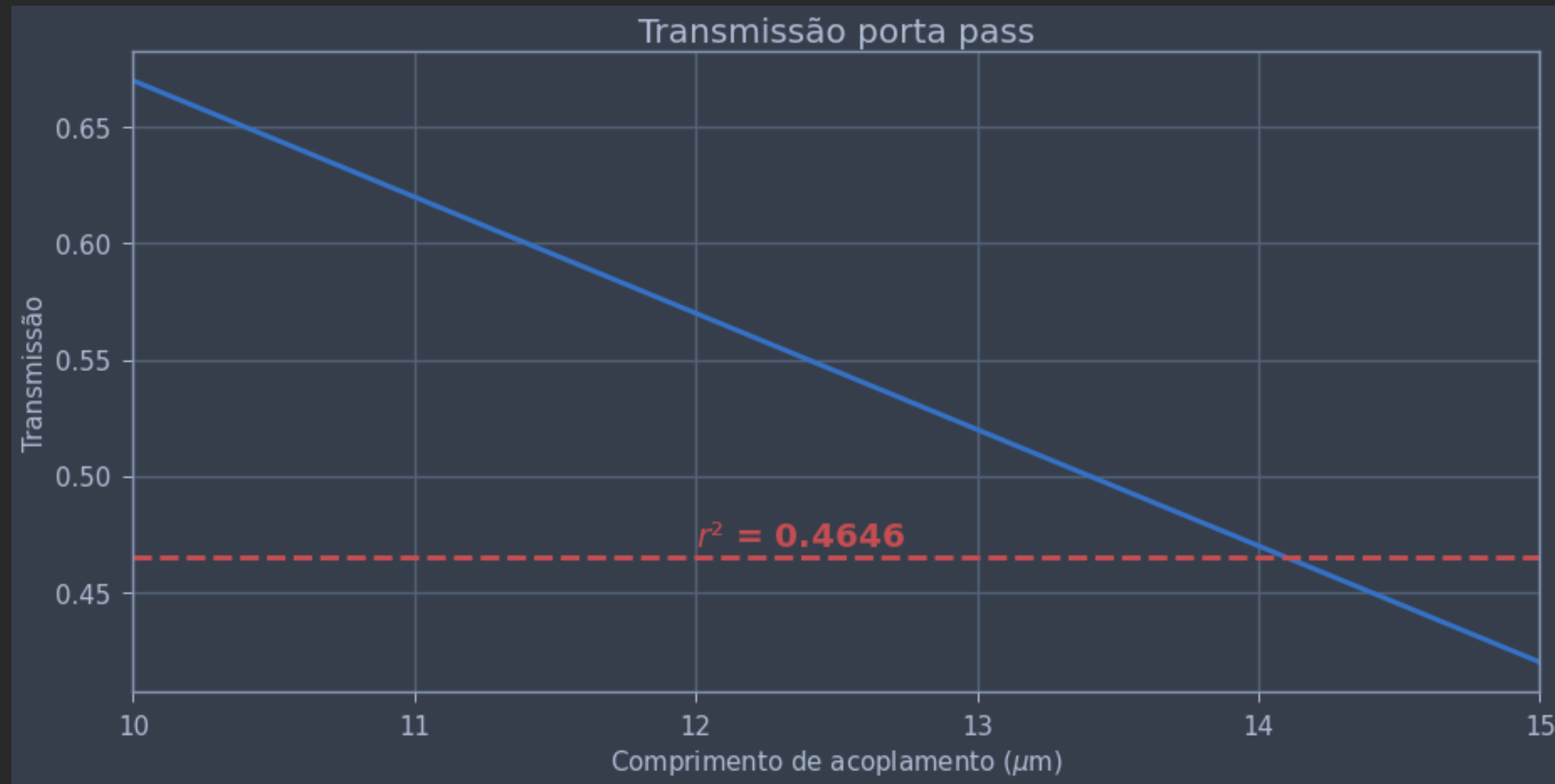
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Analise de convergência



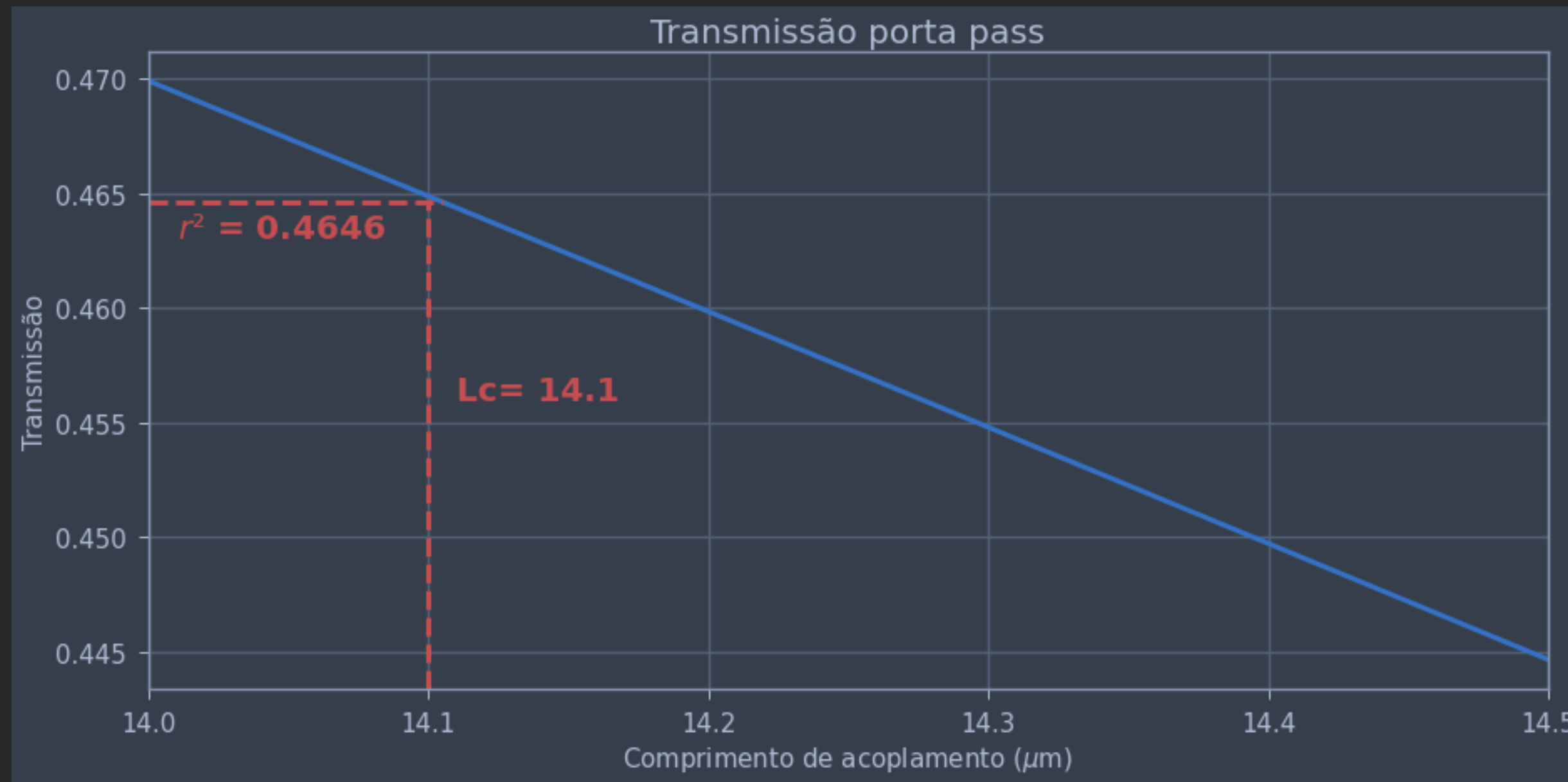
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Analise do acoplamento



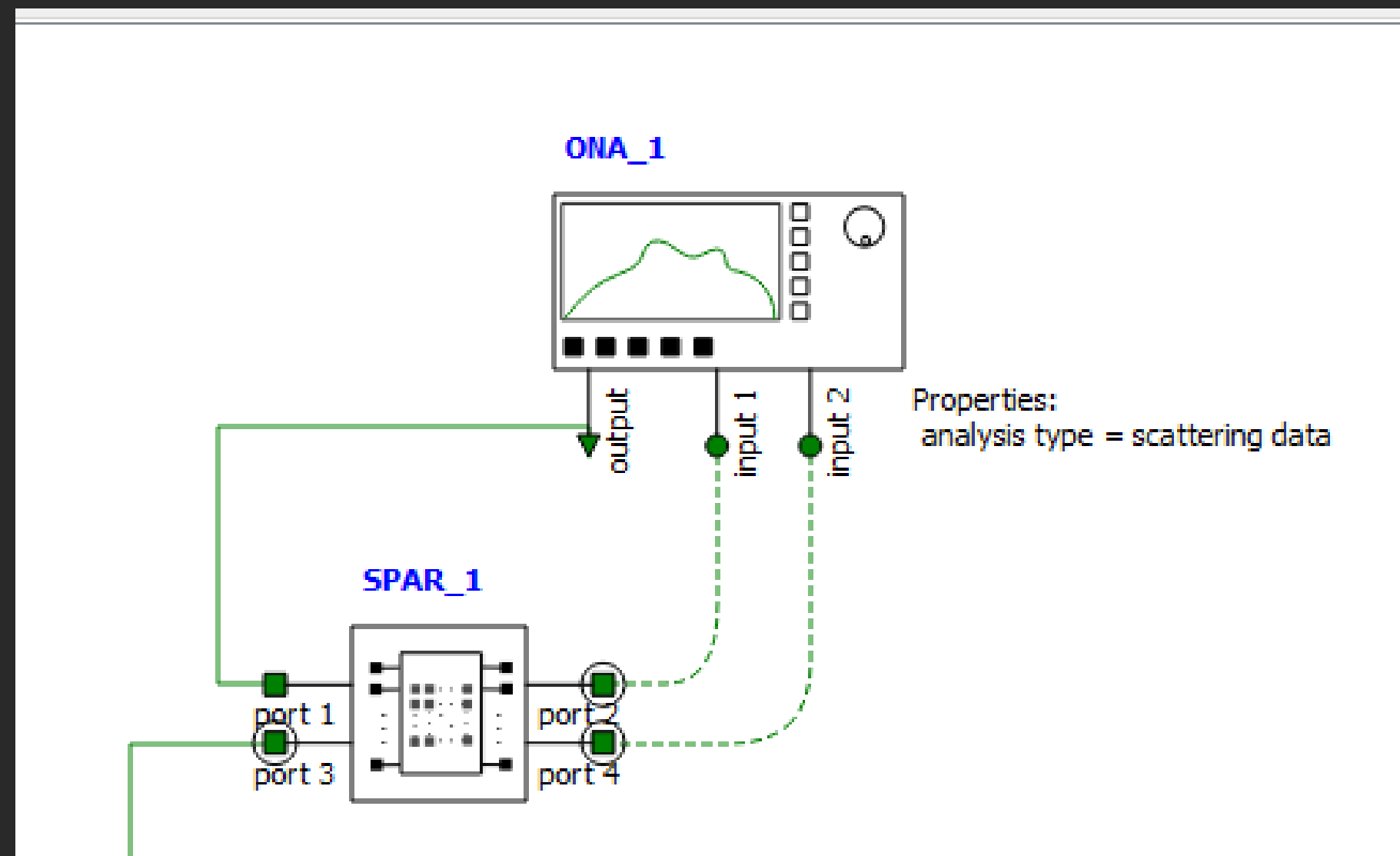
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Analise do acoplamento



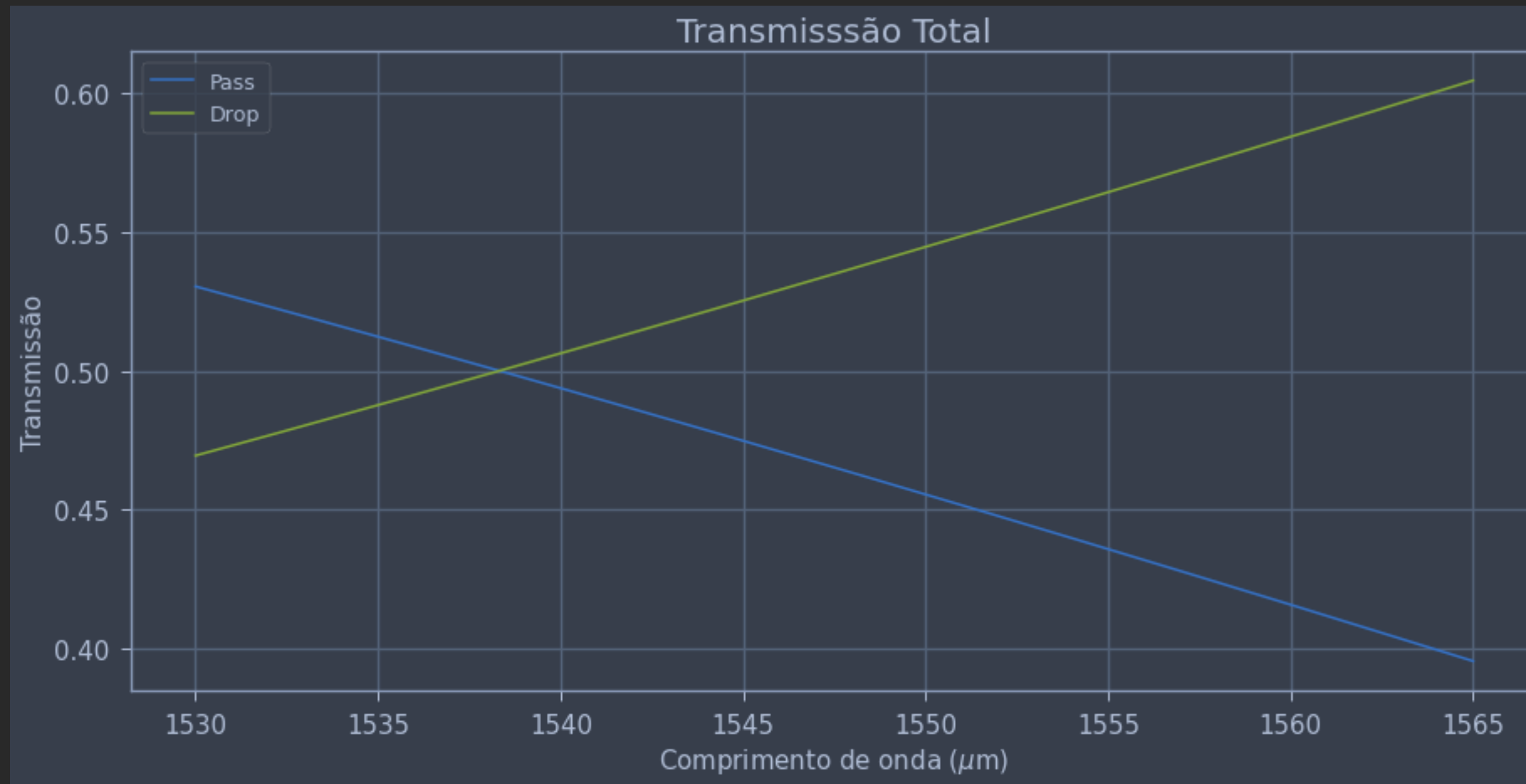
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



# DESIGN DE UM ANEL DE RESSONÂNCIA

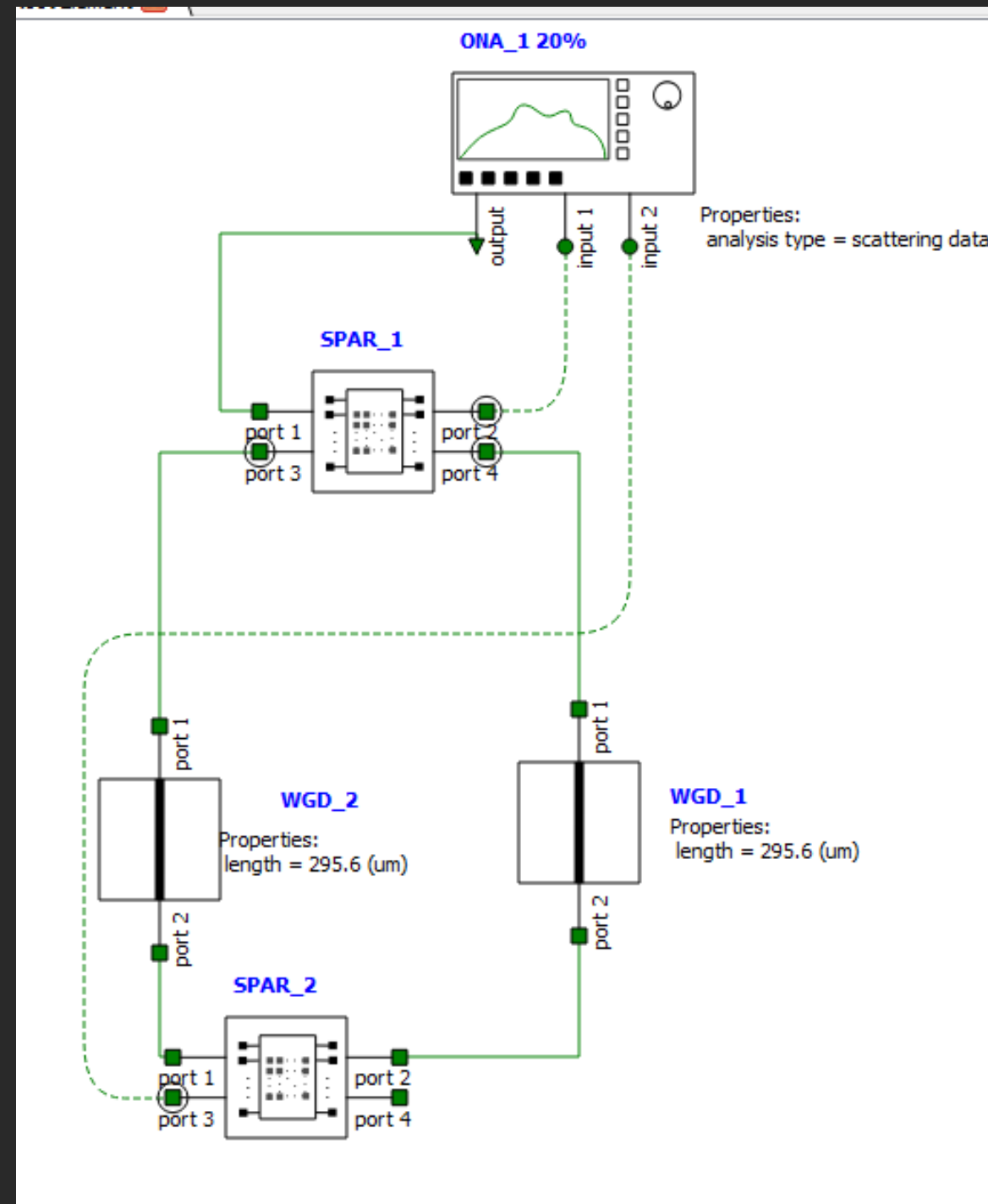
## Resultado Interconnect





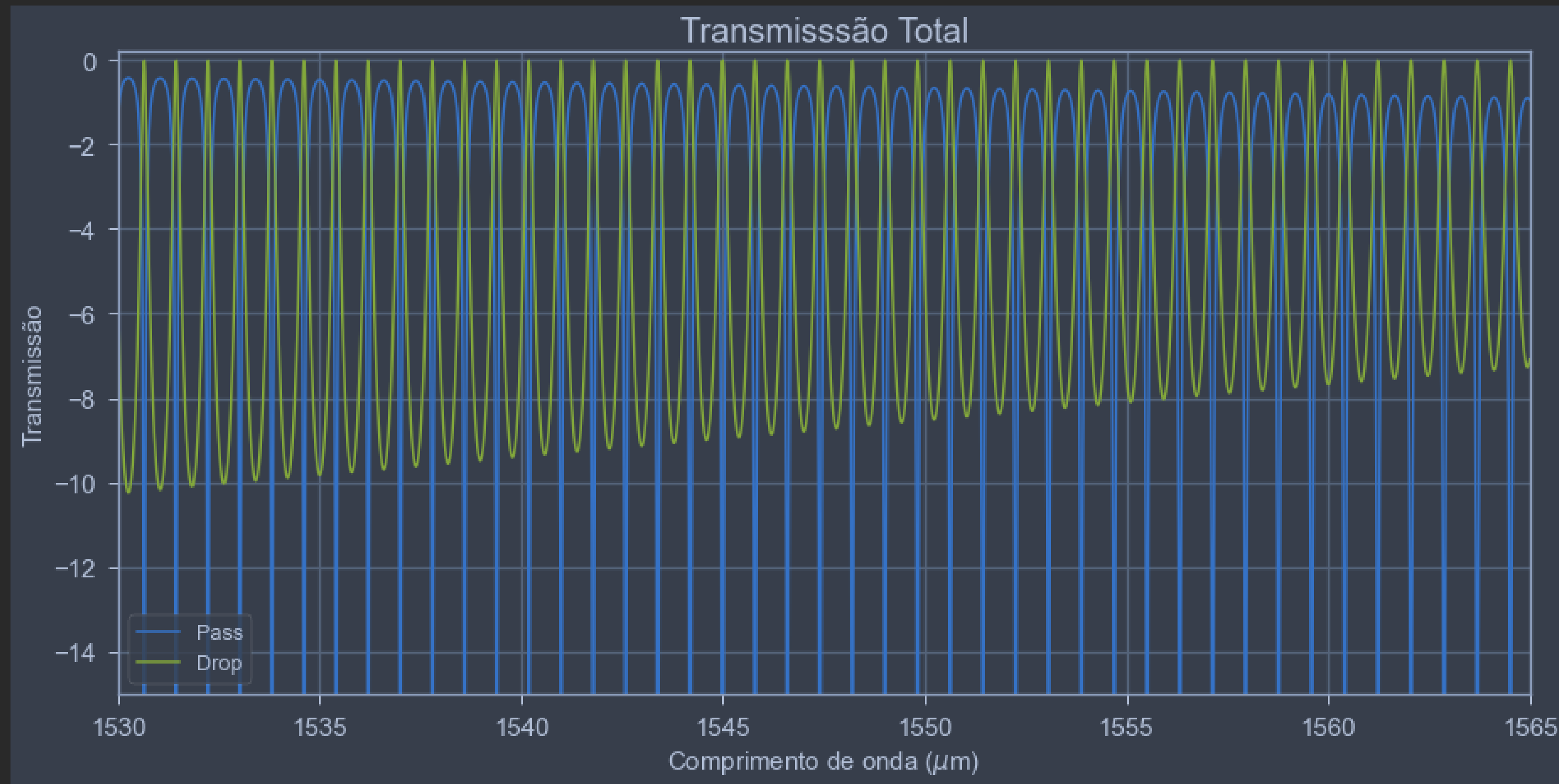
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Circuito final



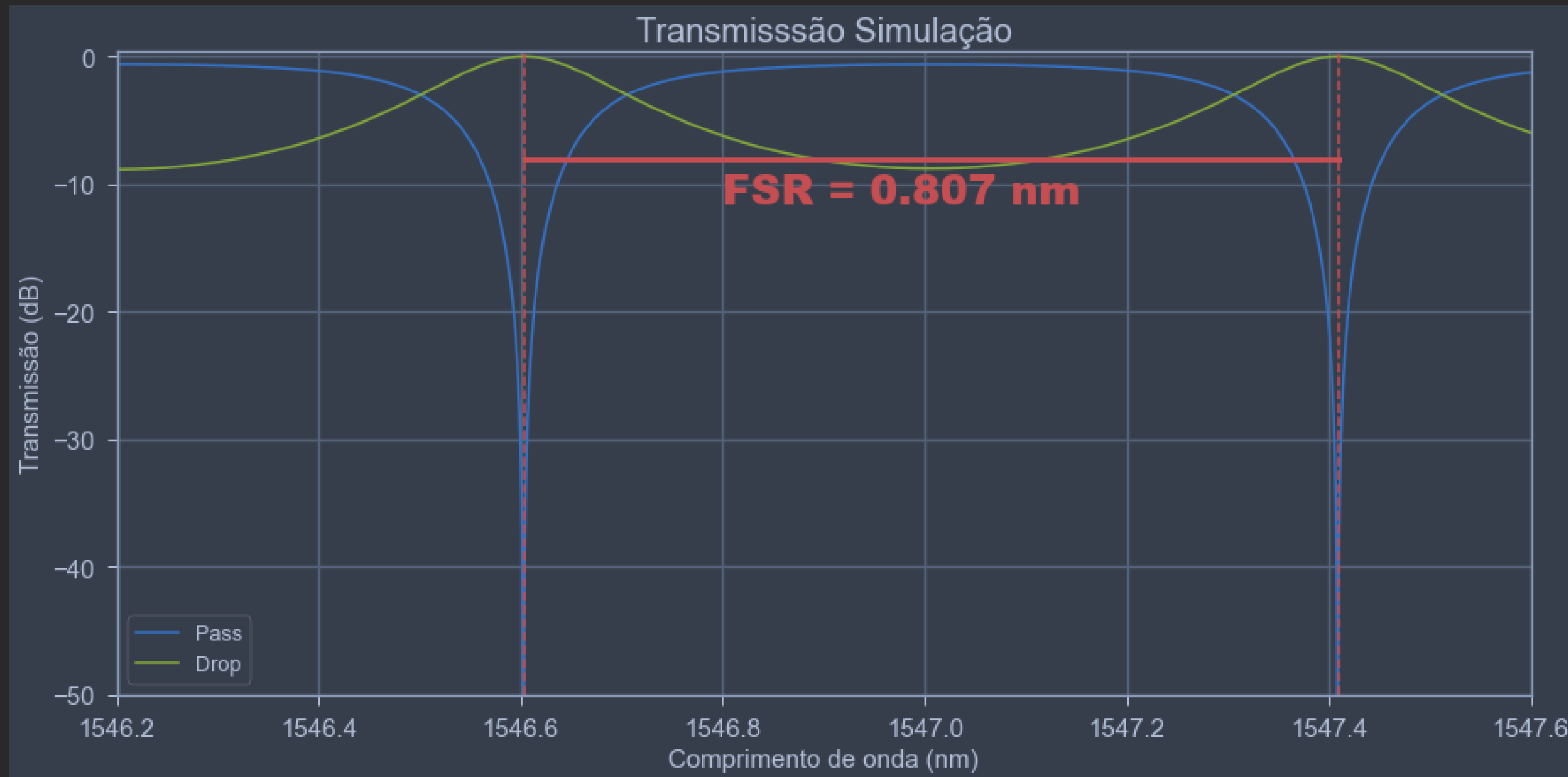
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



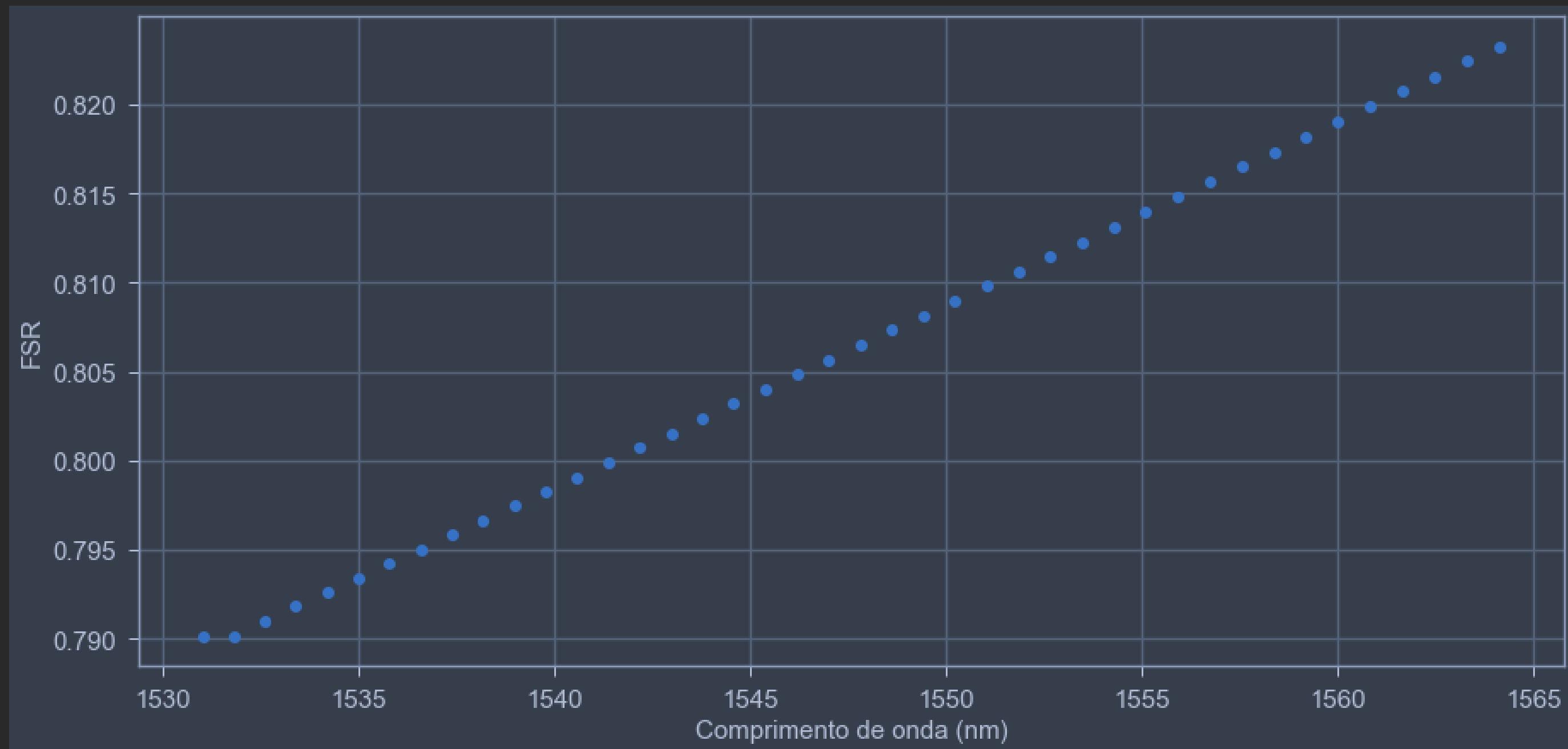
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



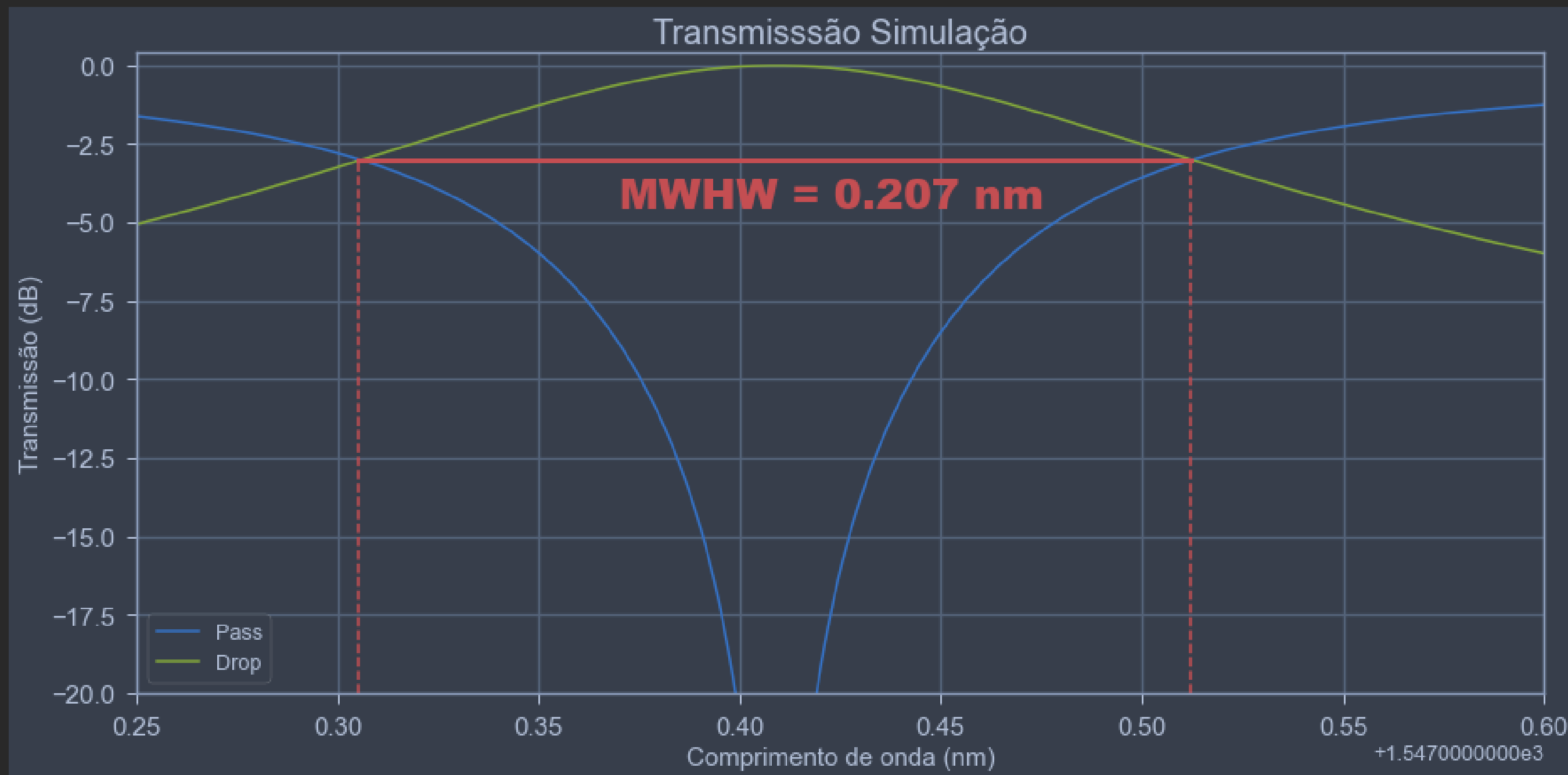
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



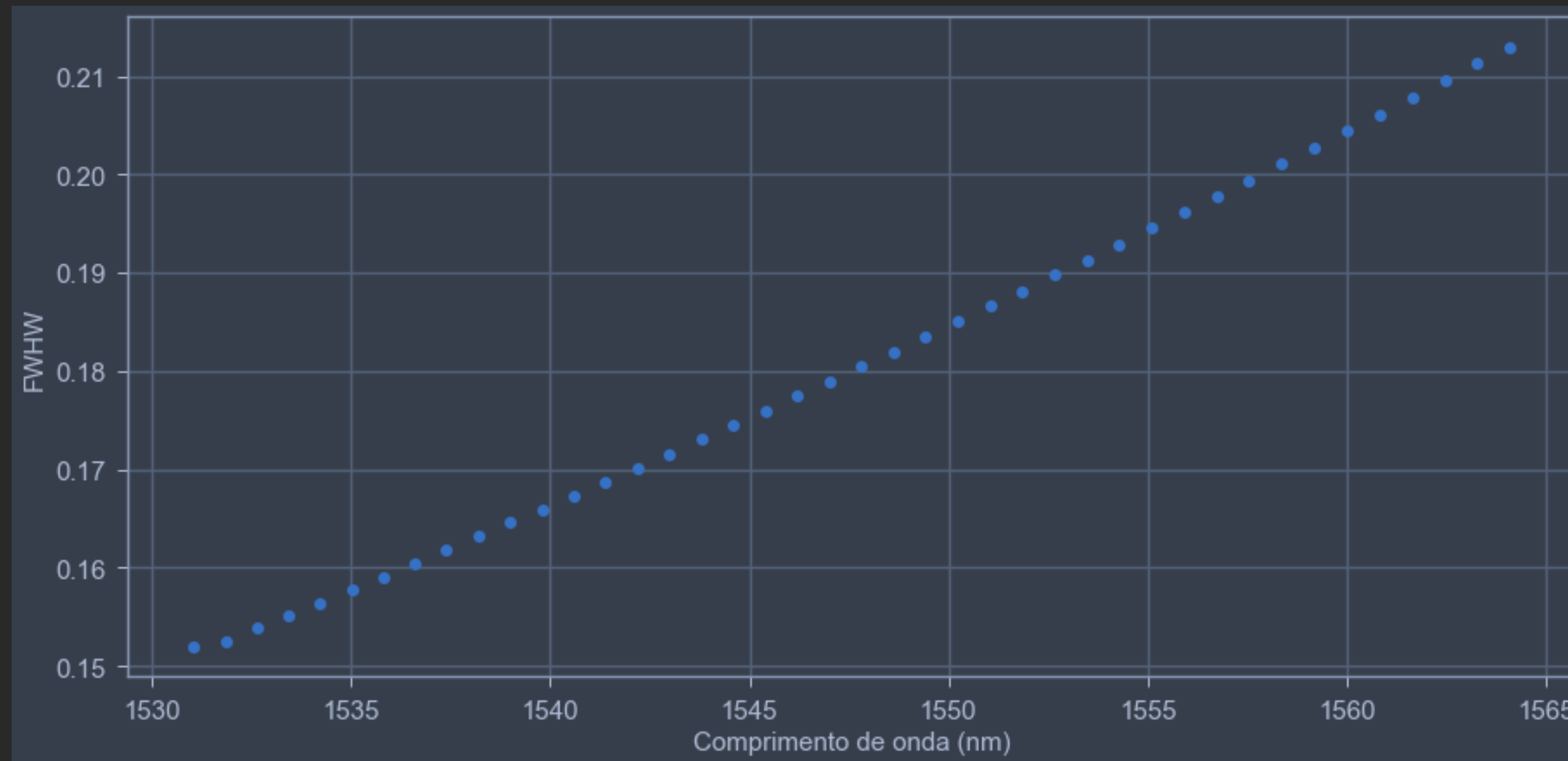
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



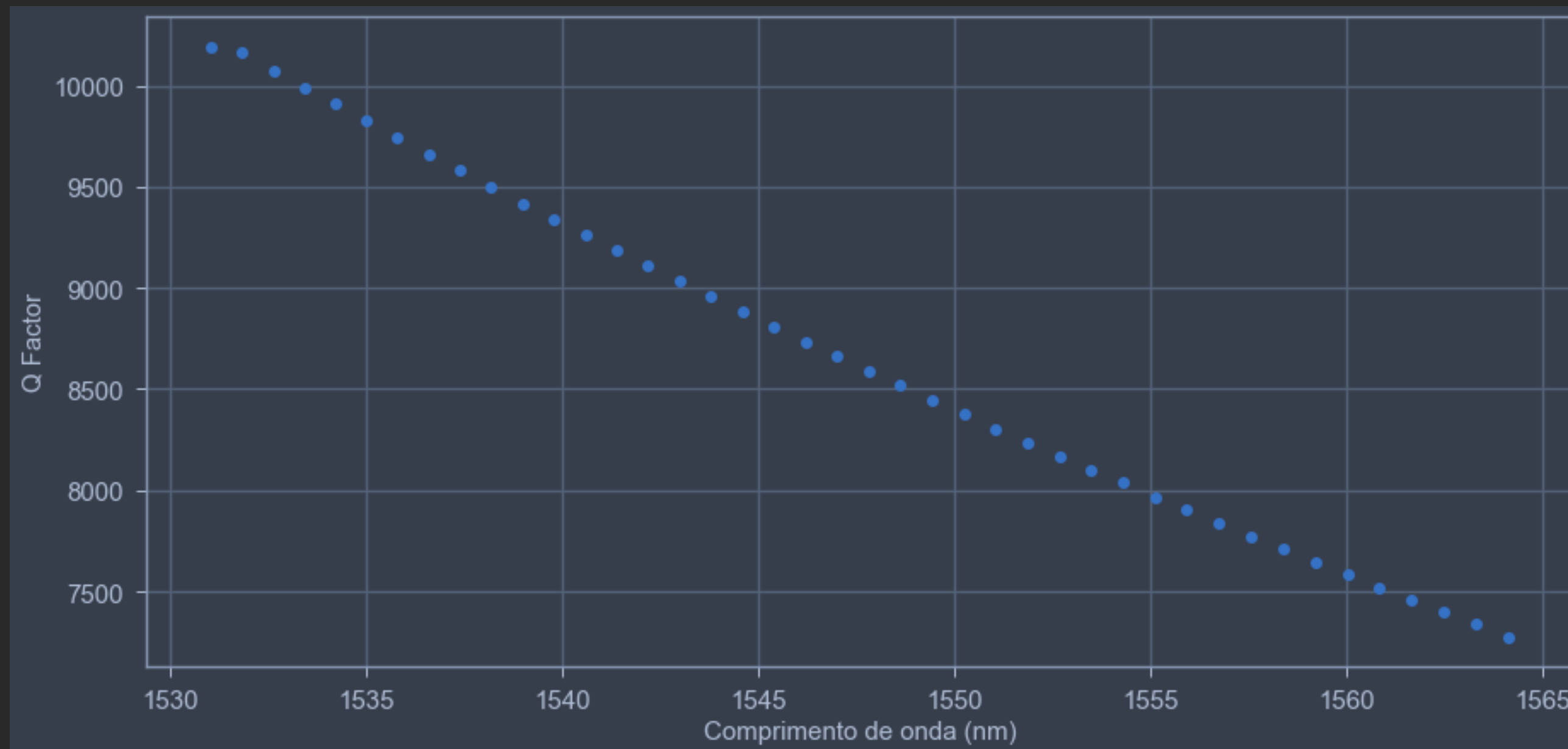
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



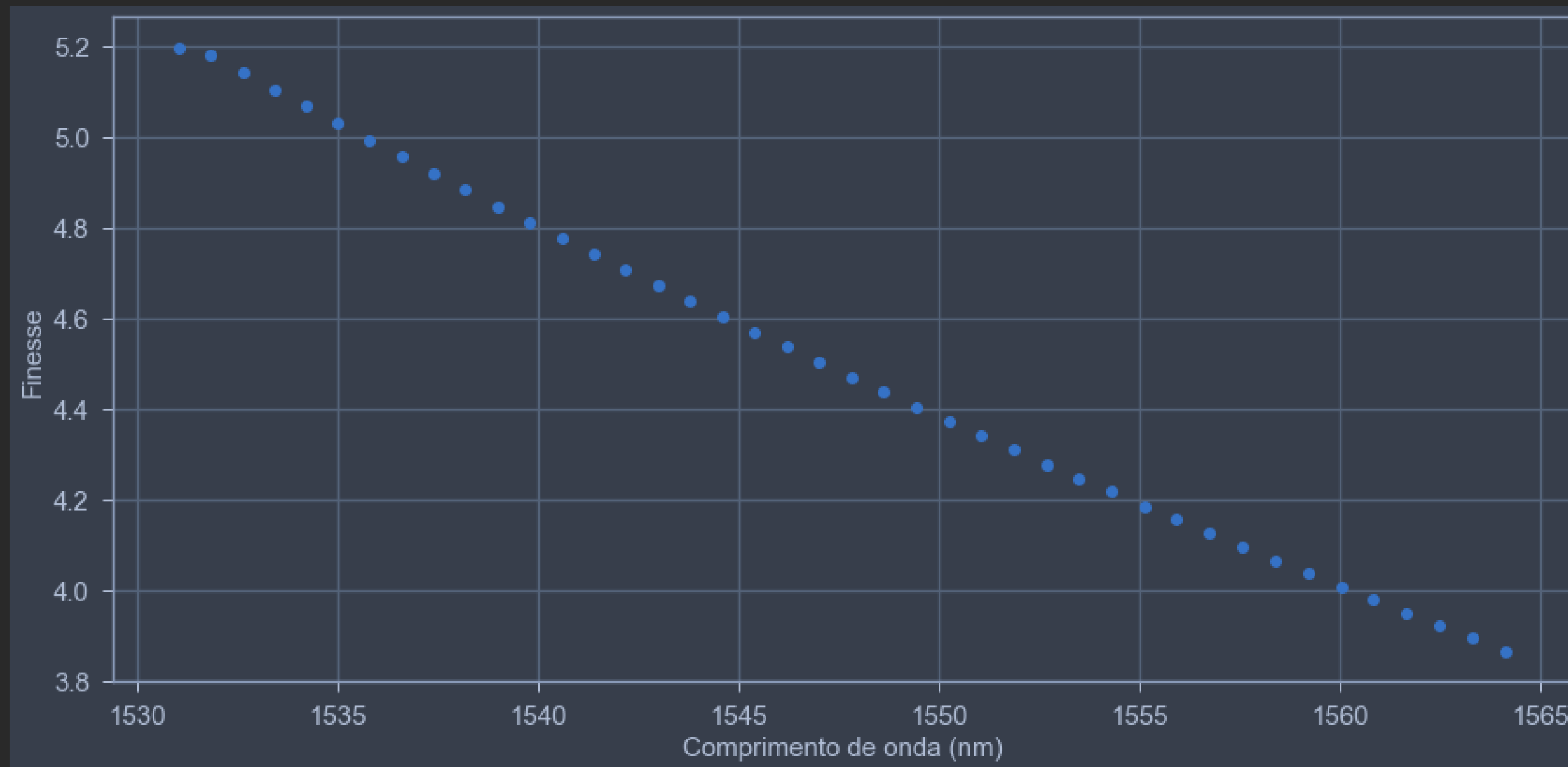
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultado Interconnect





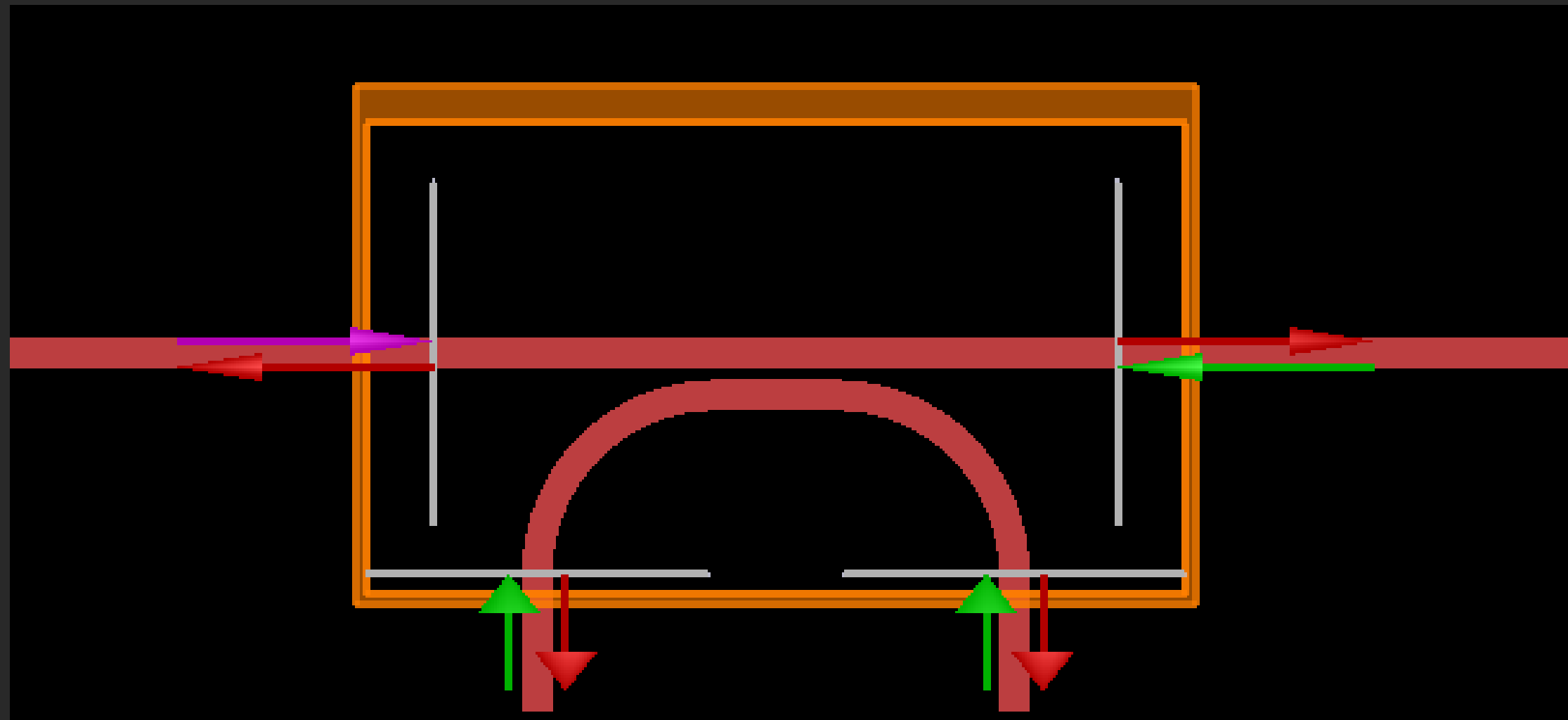
# SEMANA 5

## Otimização do 1º modelo

# DESIGN DE UM ANEL DE RESSONÂNCIA

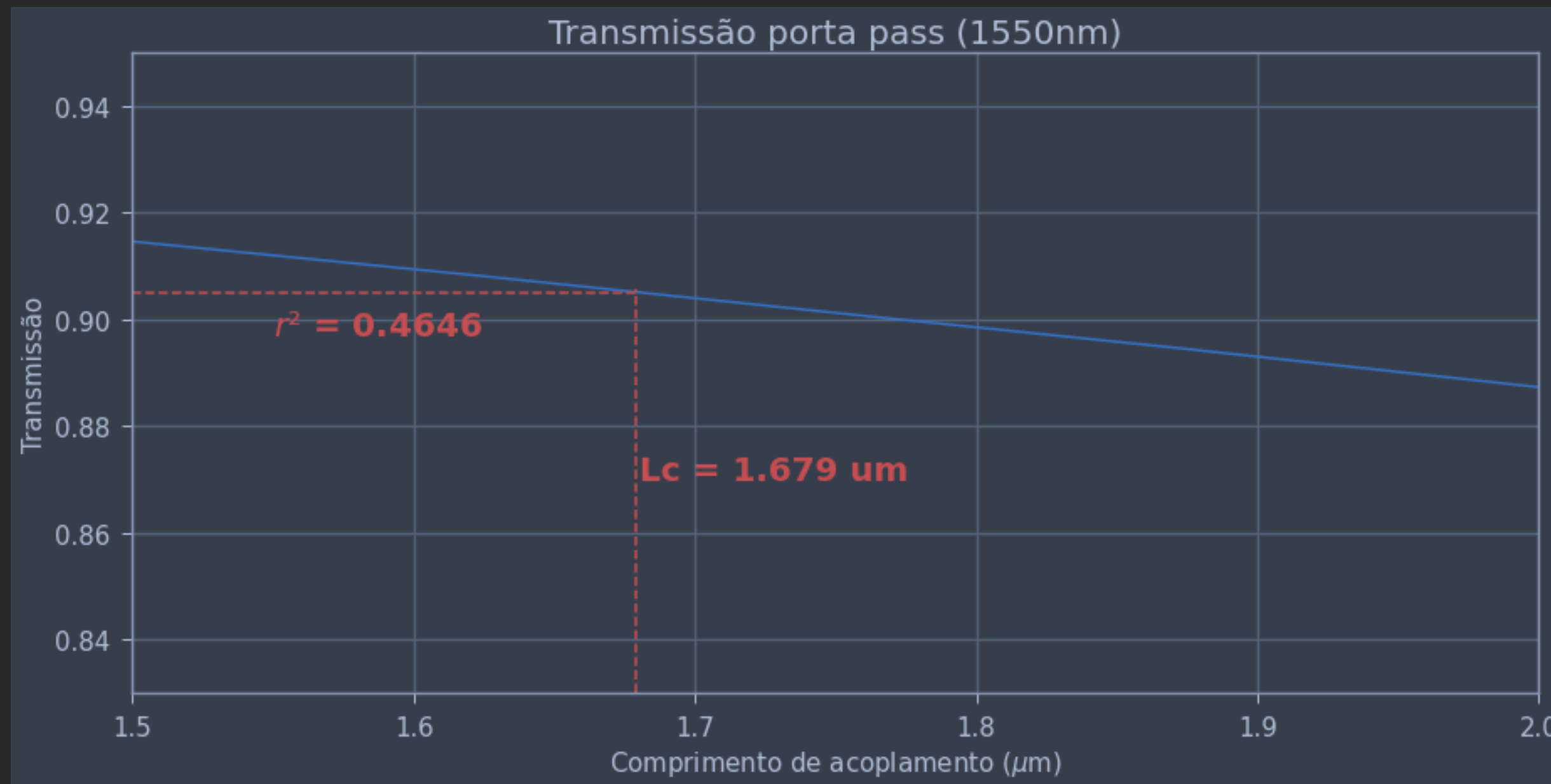
## Segunda otimização

### Chip buried



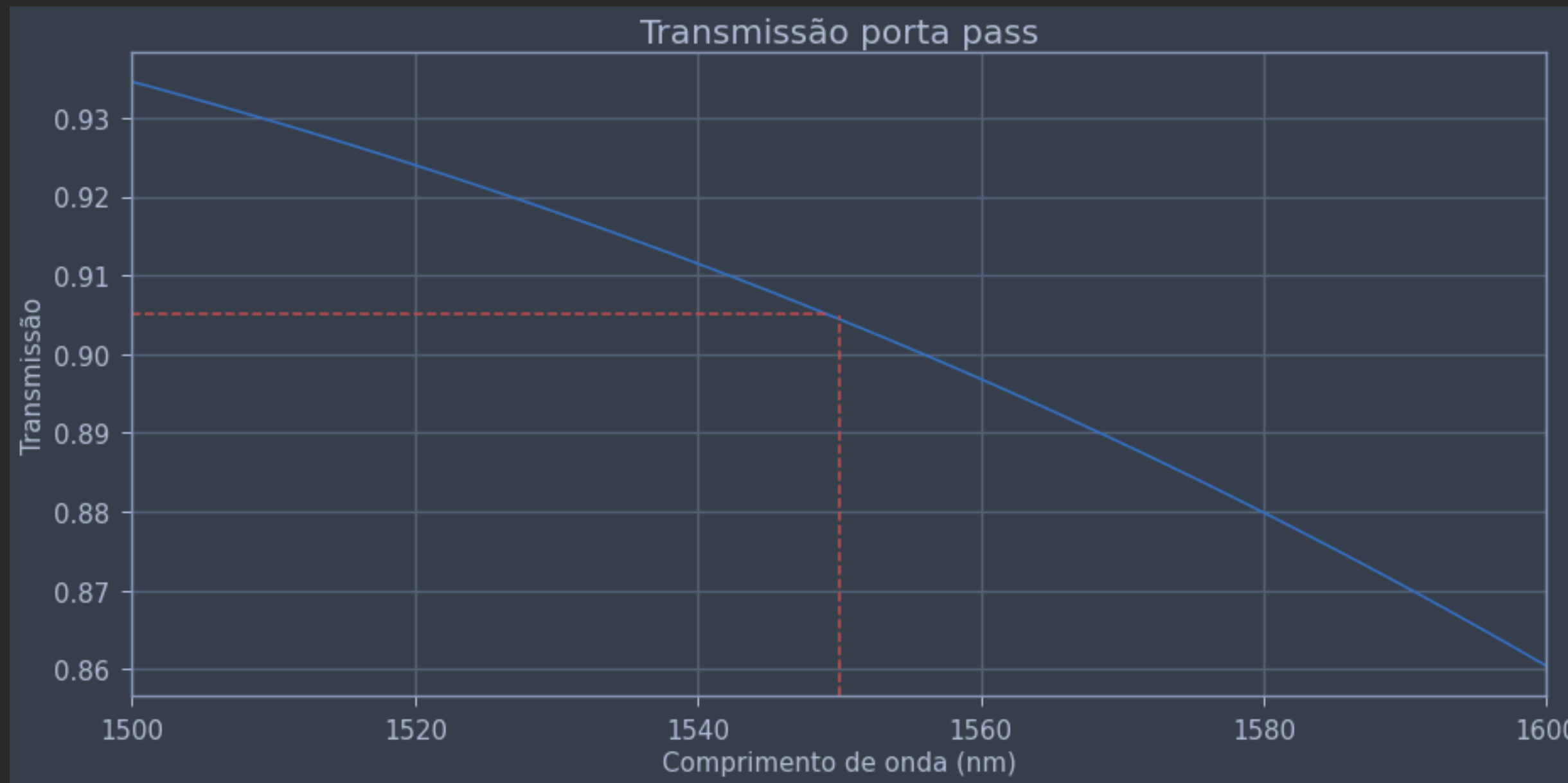
# DESIGN DE UM ANEL DE RESSONÂNCIA

## resultados sweep



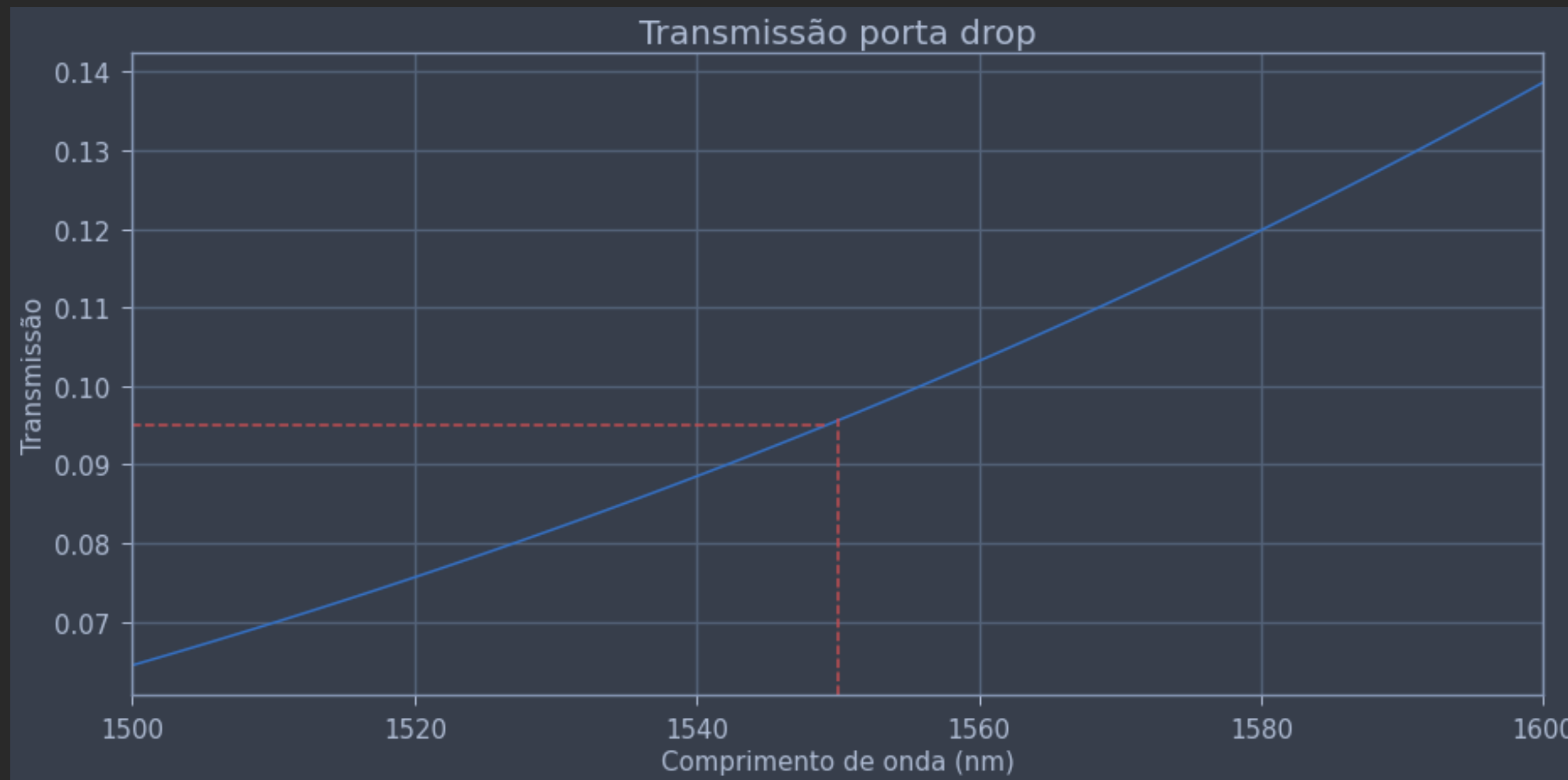
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação FDTD otimizada



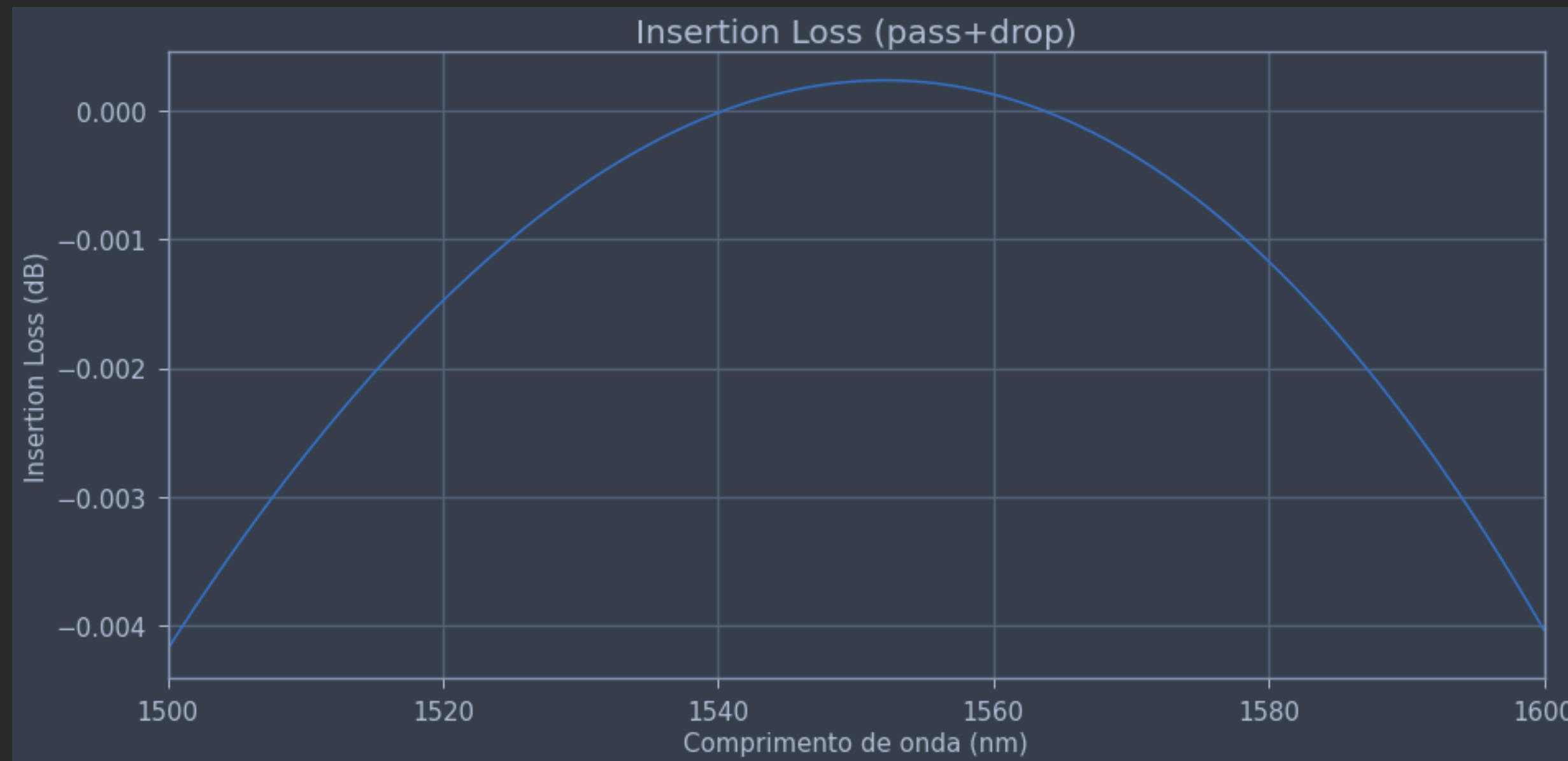
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação FDTD otimizada



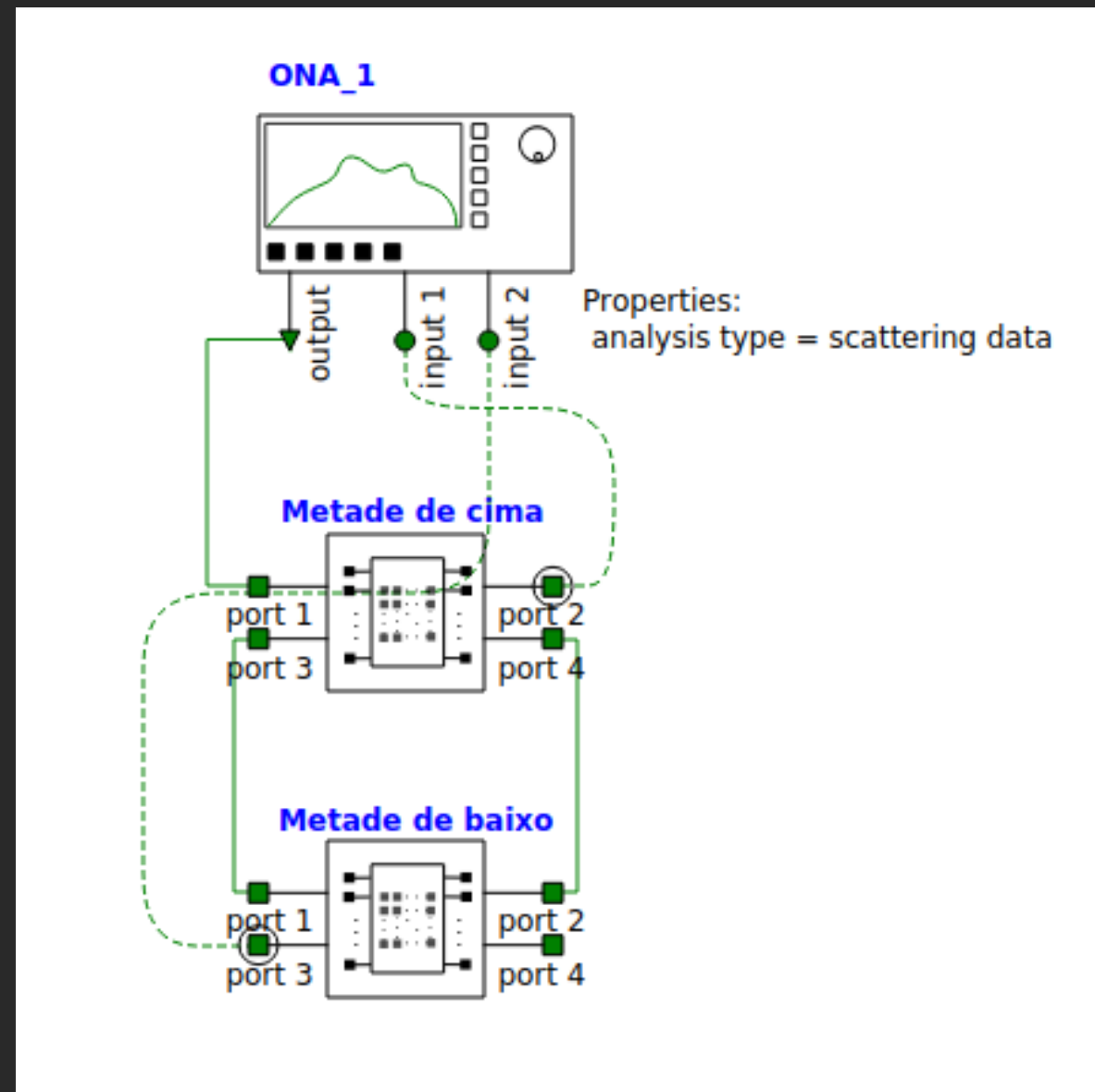
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Simulação FDTD otimizada



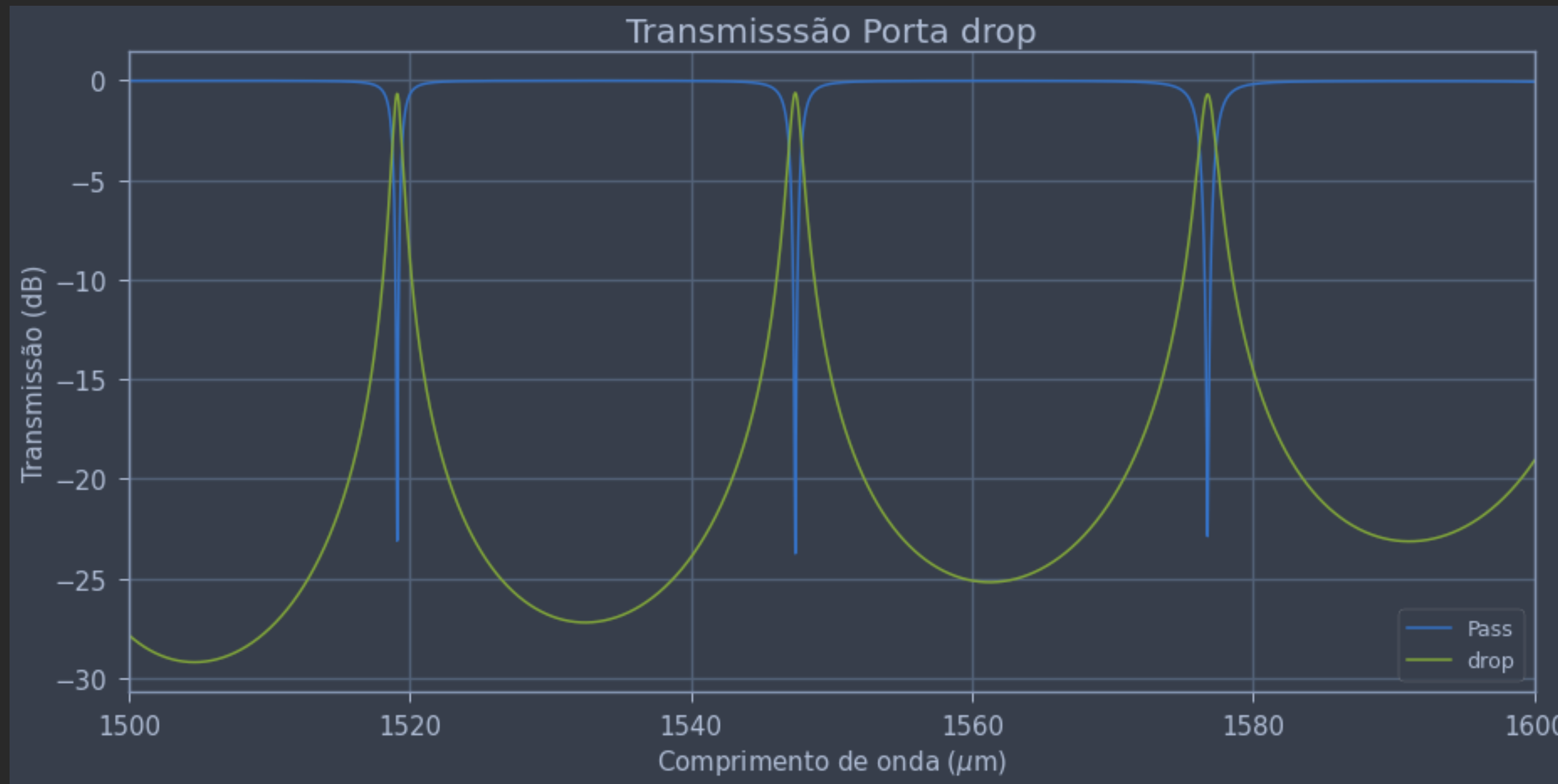
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Export Interconnect



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados





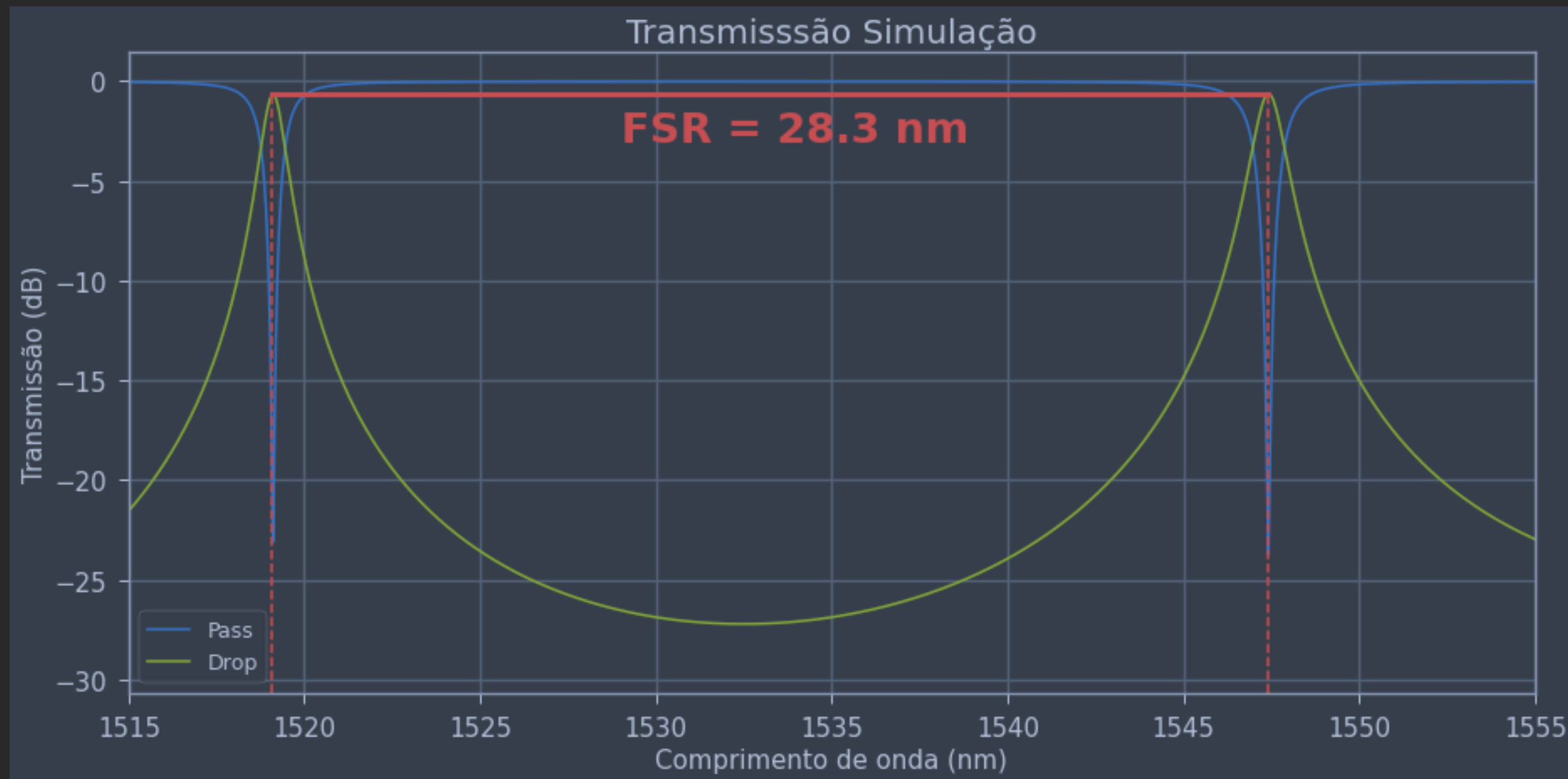
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



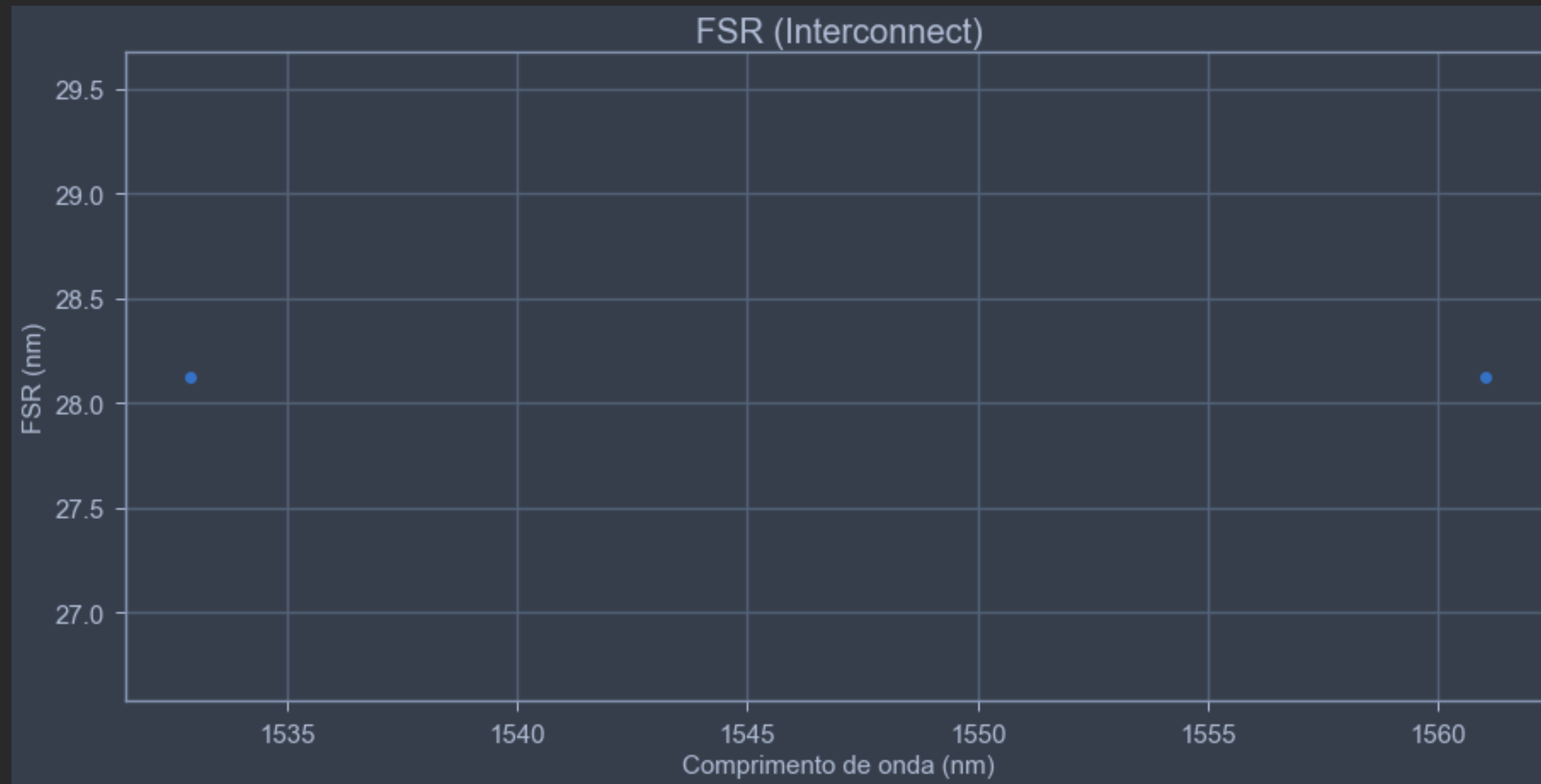
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



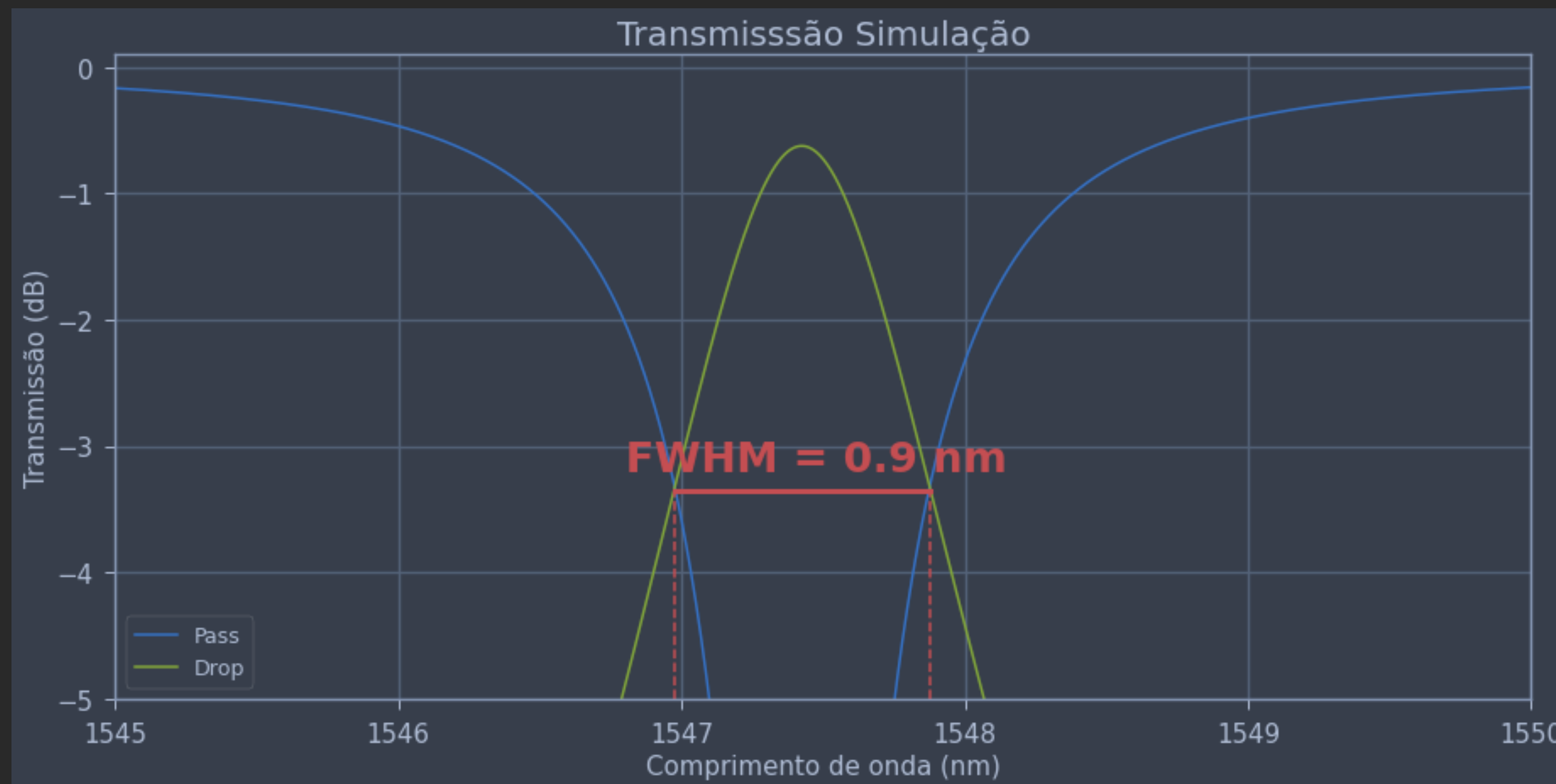
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



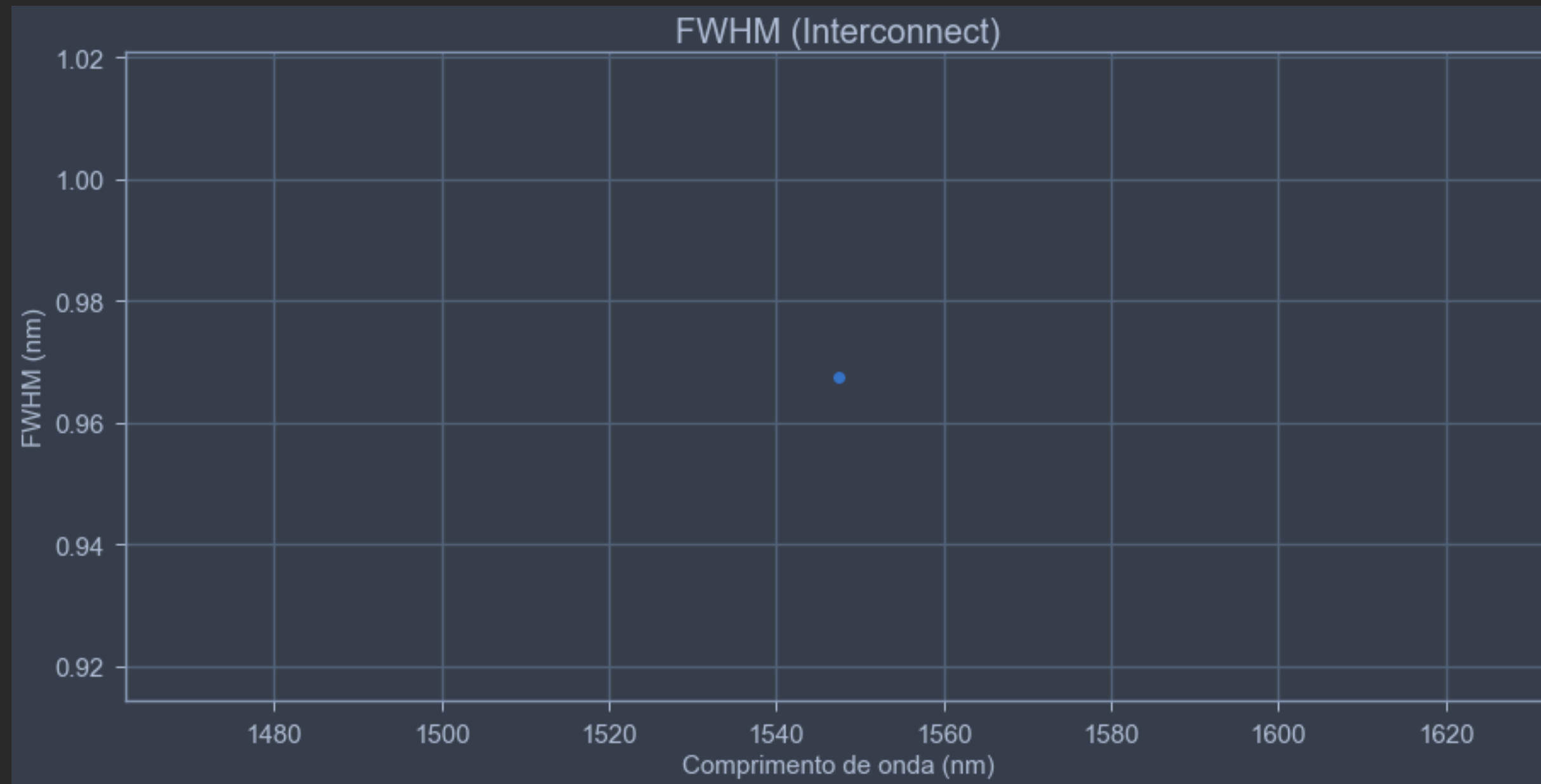
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Resultados finais do modelo 1

### Teorico

**FSR = 27.7 nm**

**MWHW = 0.88 nm**

**Finesse = 31.48**

**Q factor = 1761**

**SOI in SiO<sub>2</sub>**

### Obtido

**FSR = 28.3 nm**

**MWHW = 0.9 nm**

**Finesse = 31.44**

**Q factor = 1722**

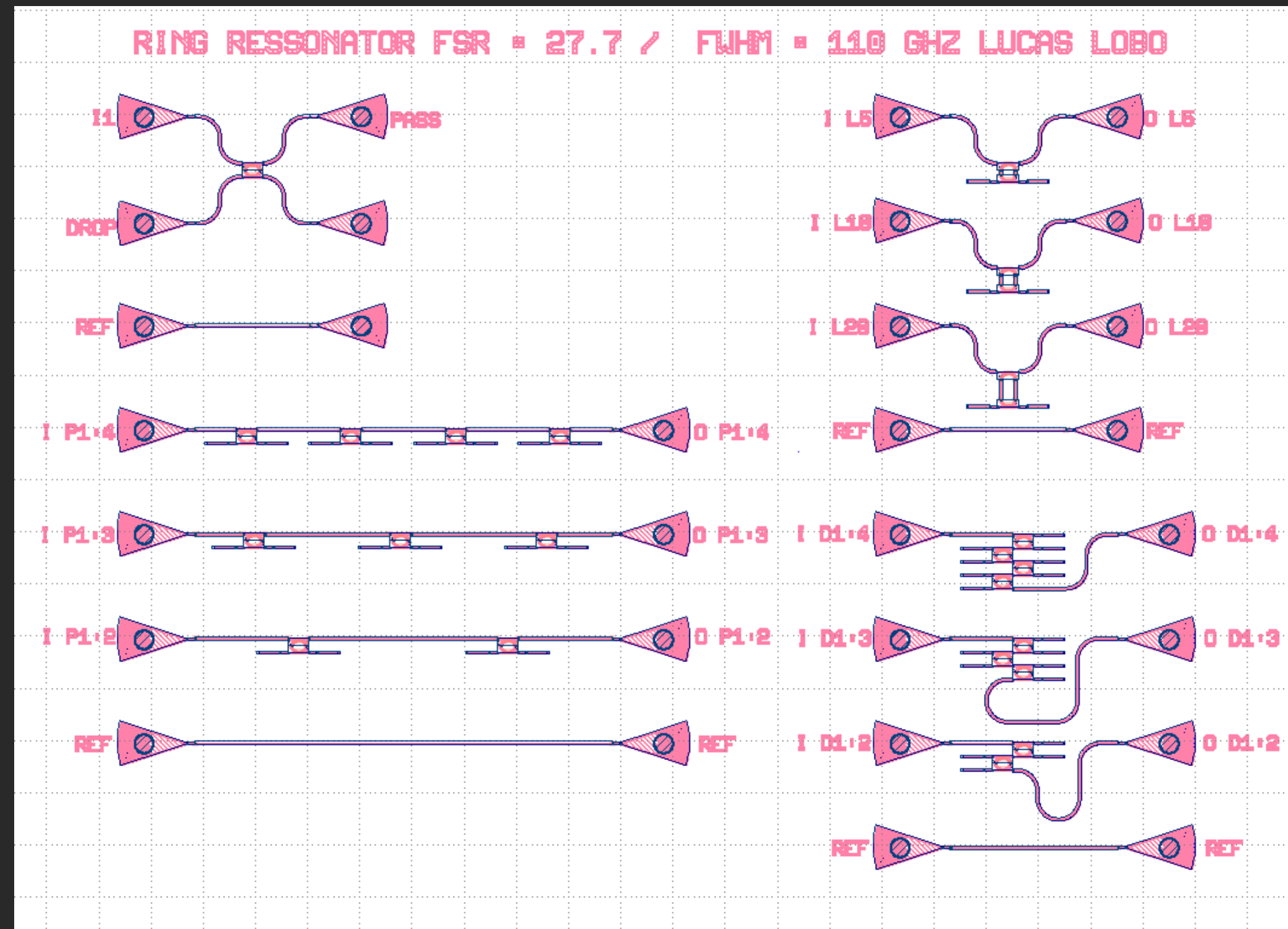
**Buried in SiO<sub>2</sub>**

# SEMANA 6

## Design do chip

# DESIGN DE UM ANEL DE RESSONÂNCIA

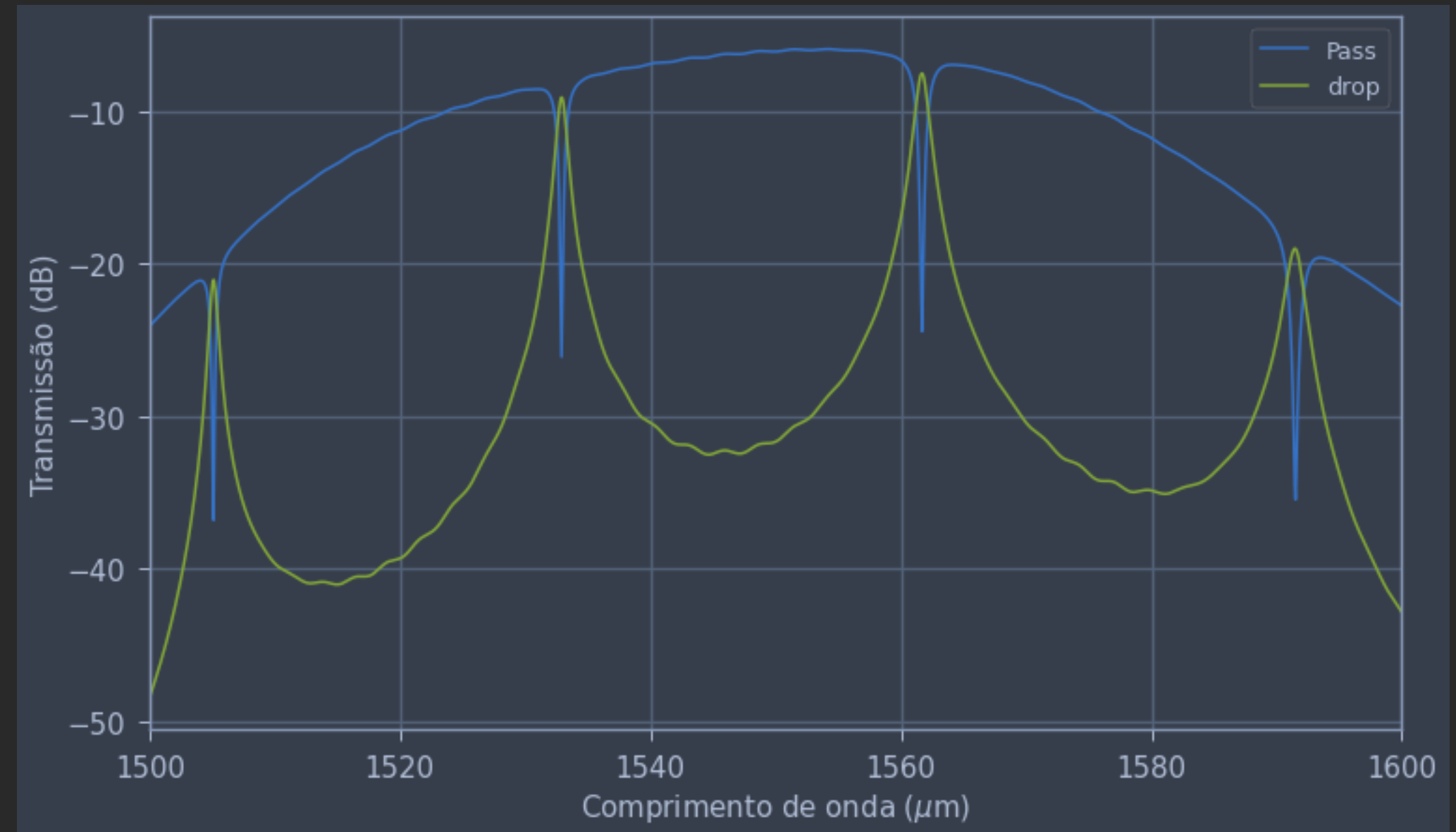
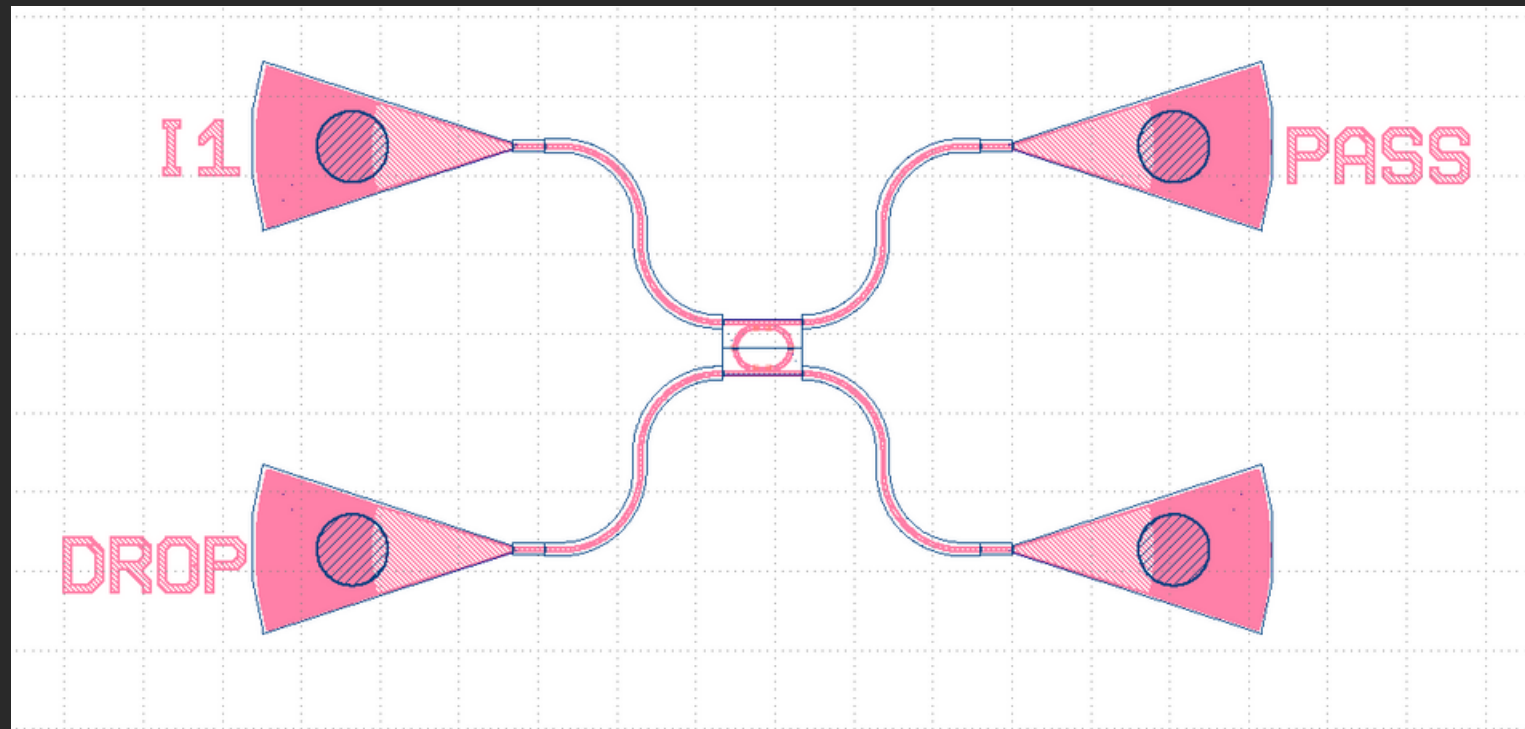
## Chip completo





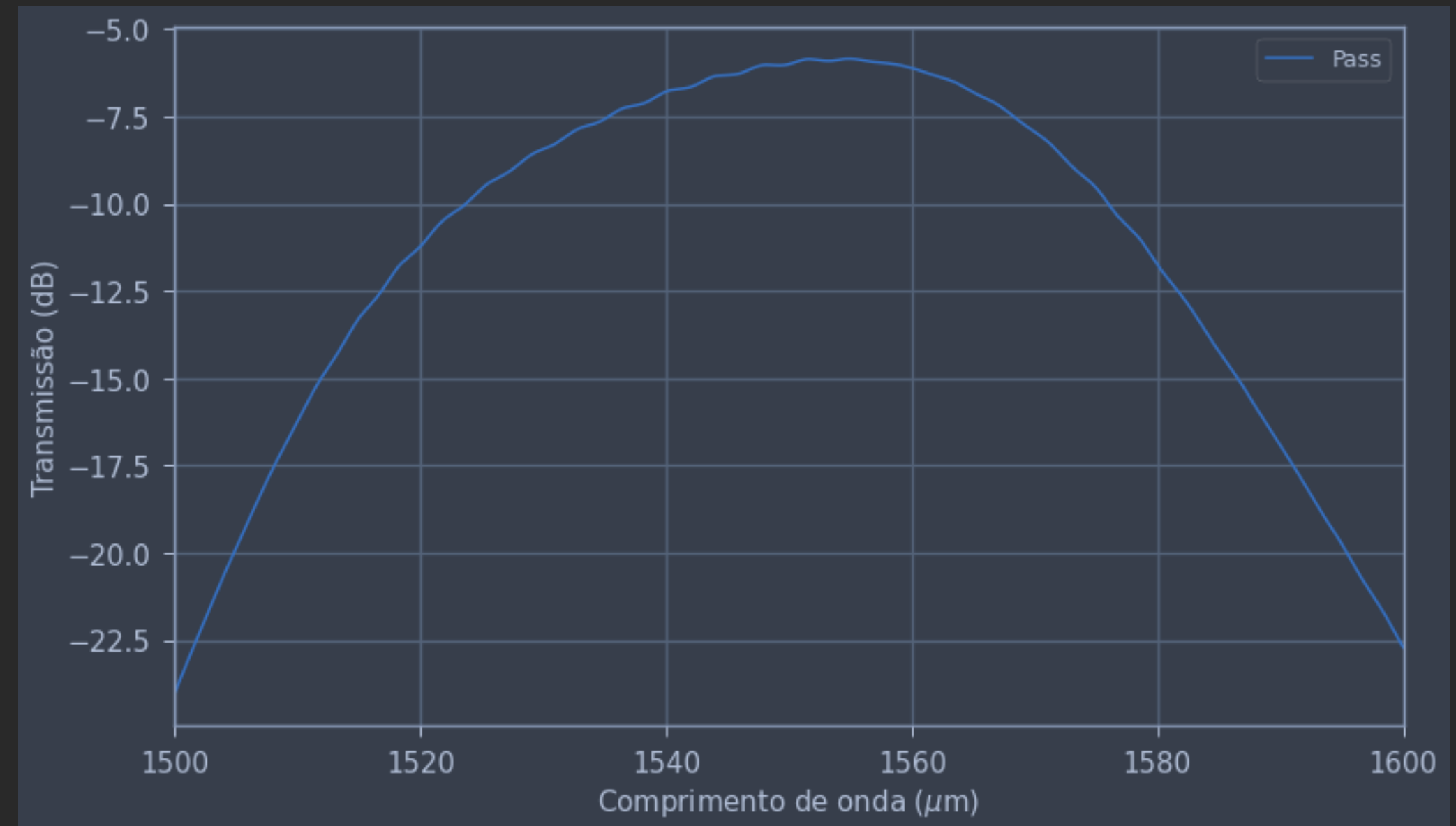
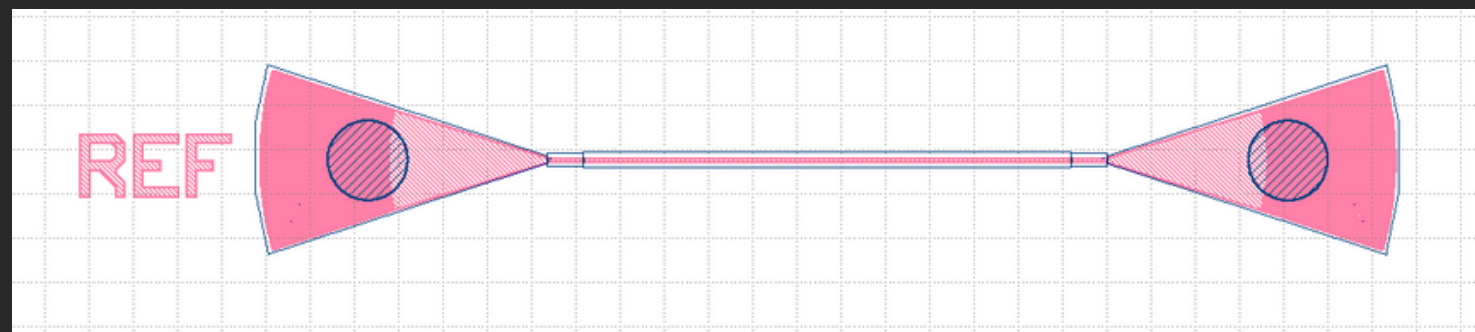
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Circuito basico



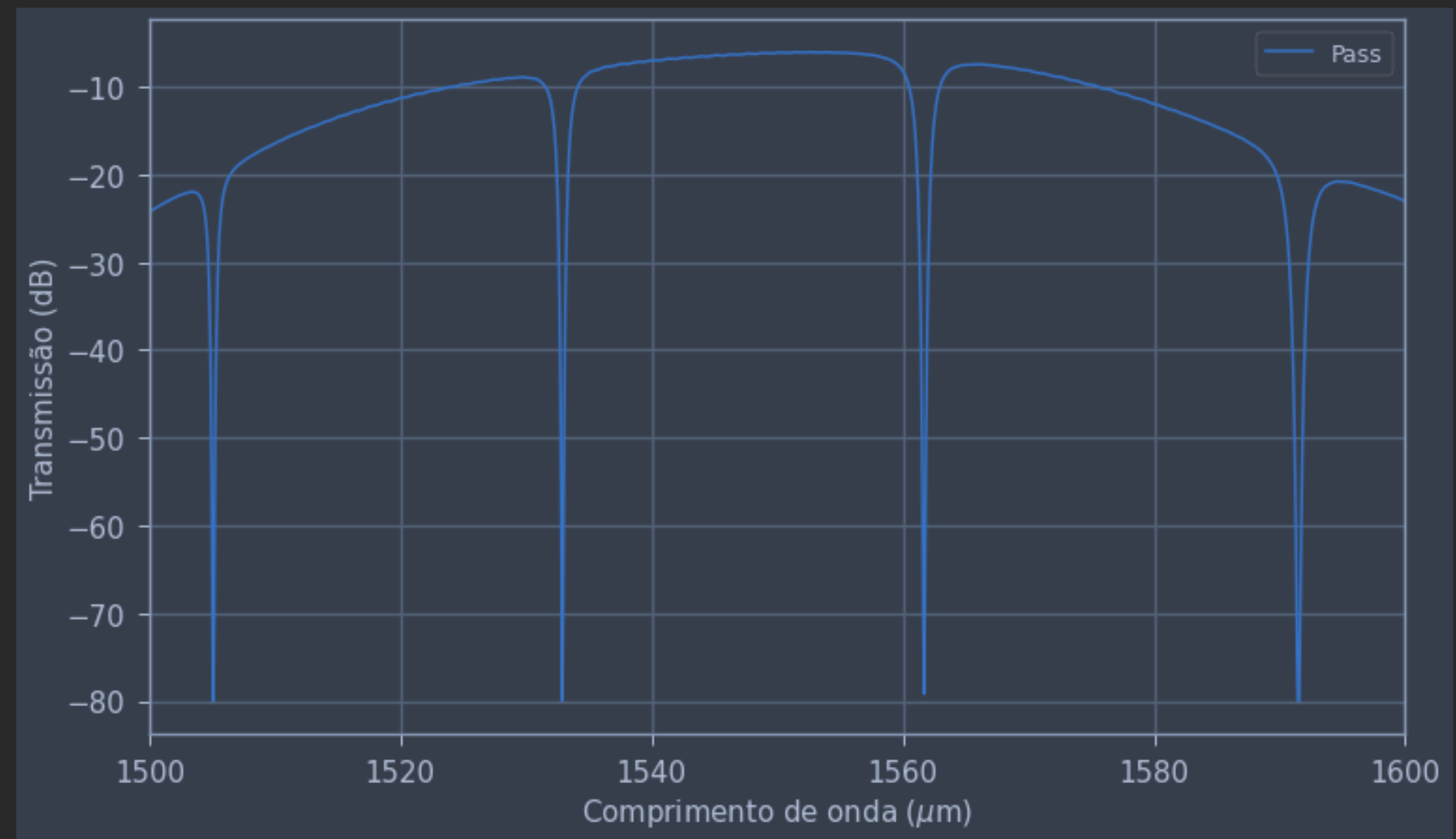
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Circuito basico



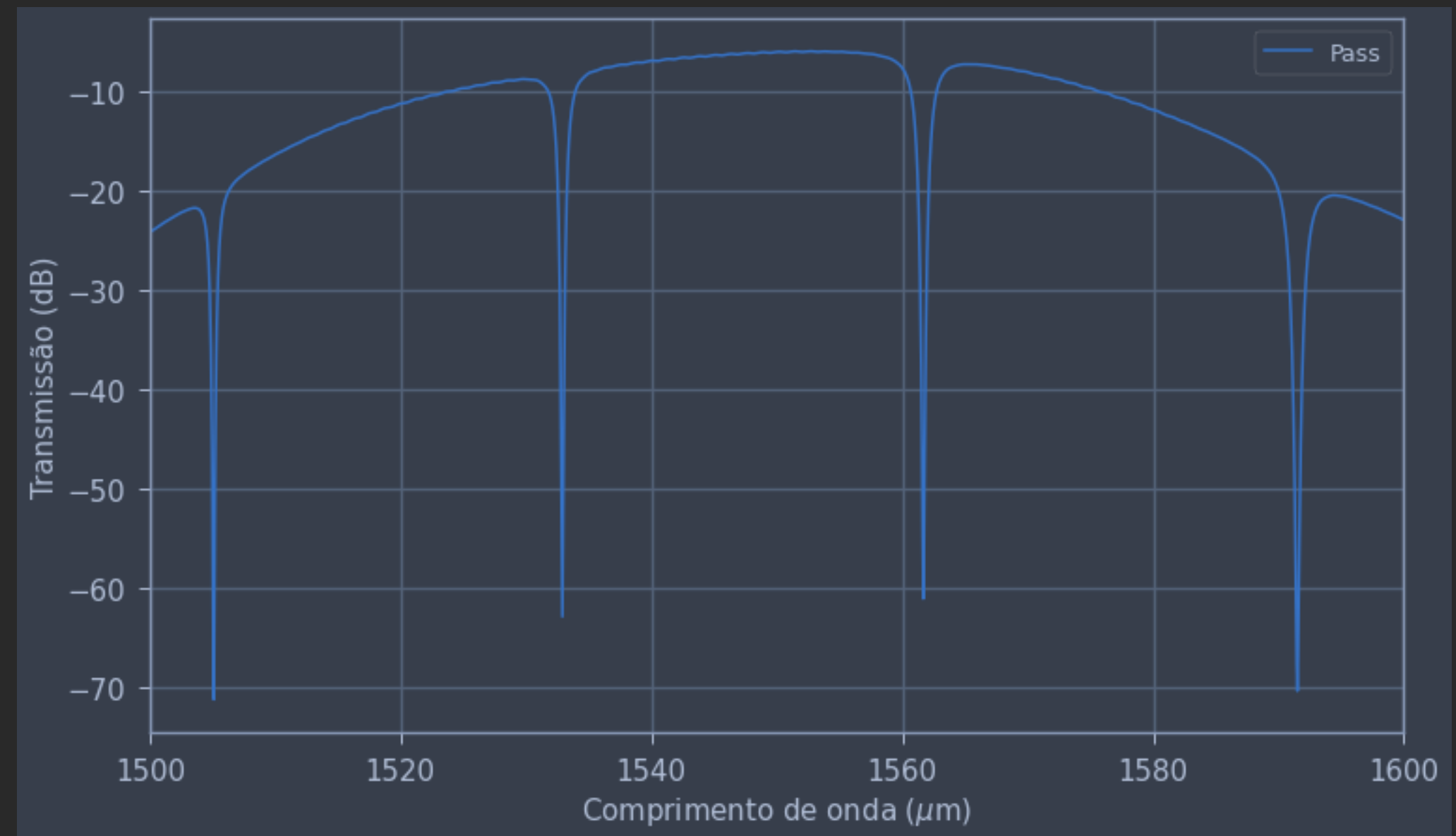
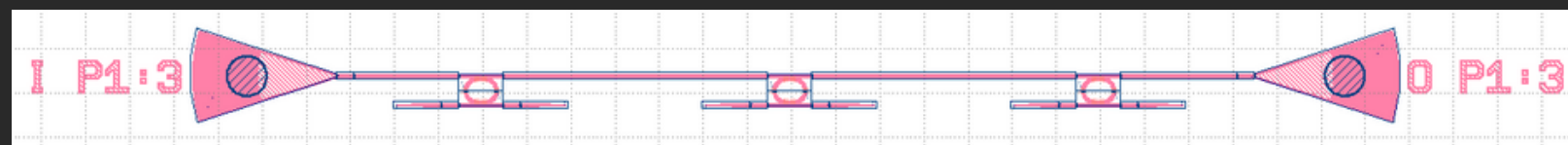
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Pass em cascata



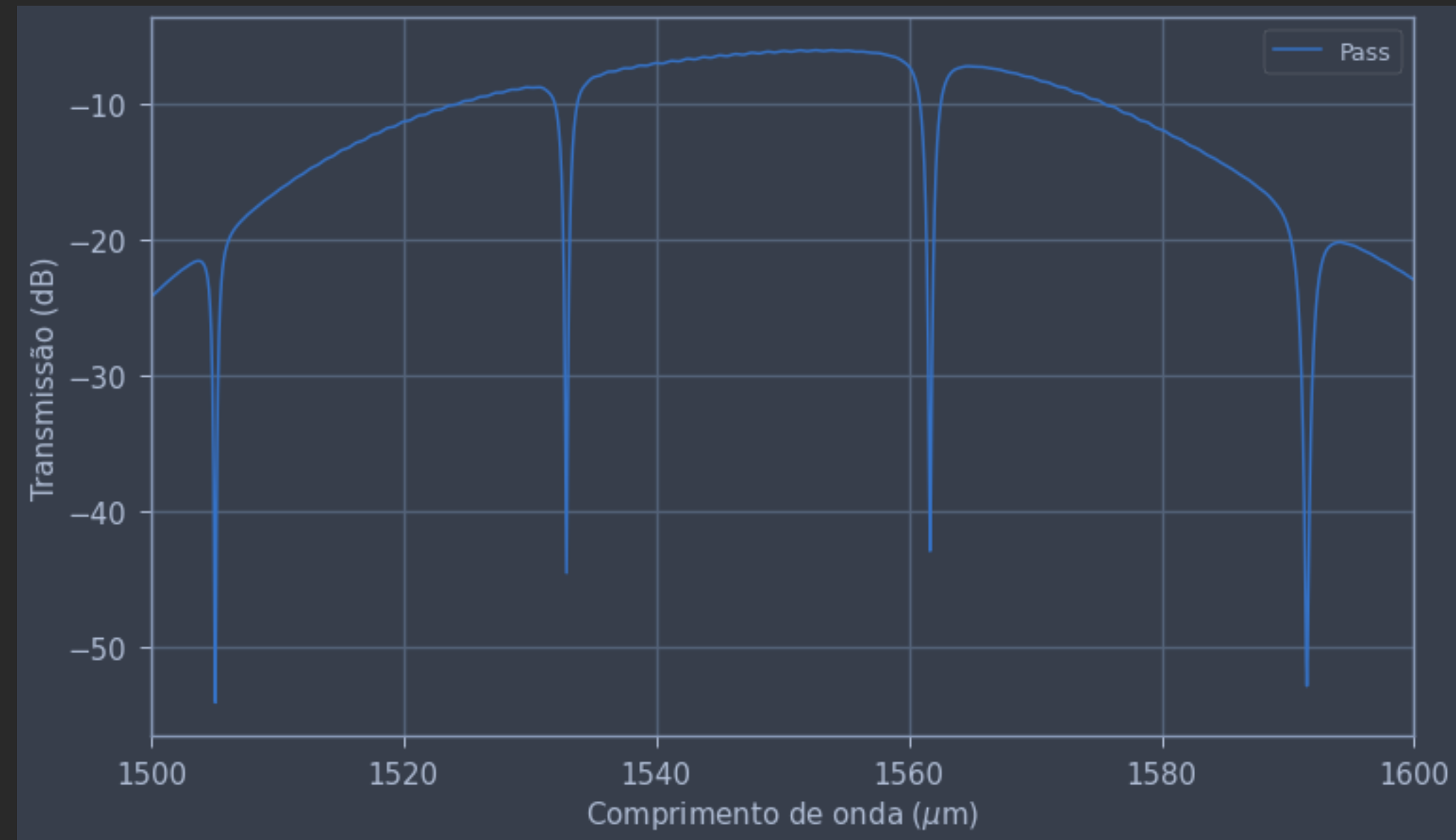
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Pass em cascata



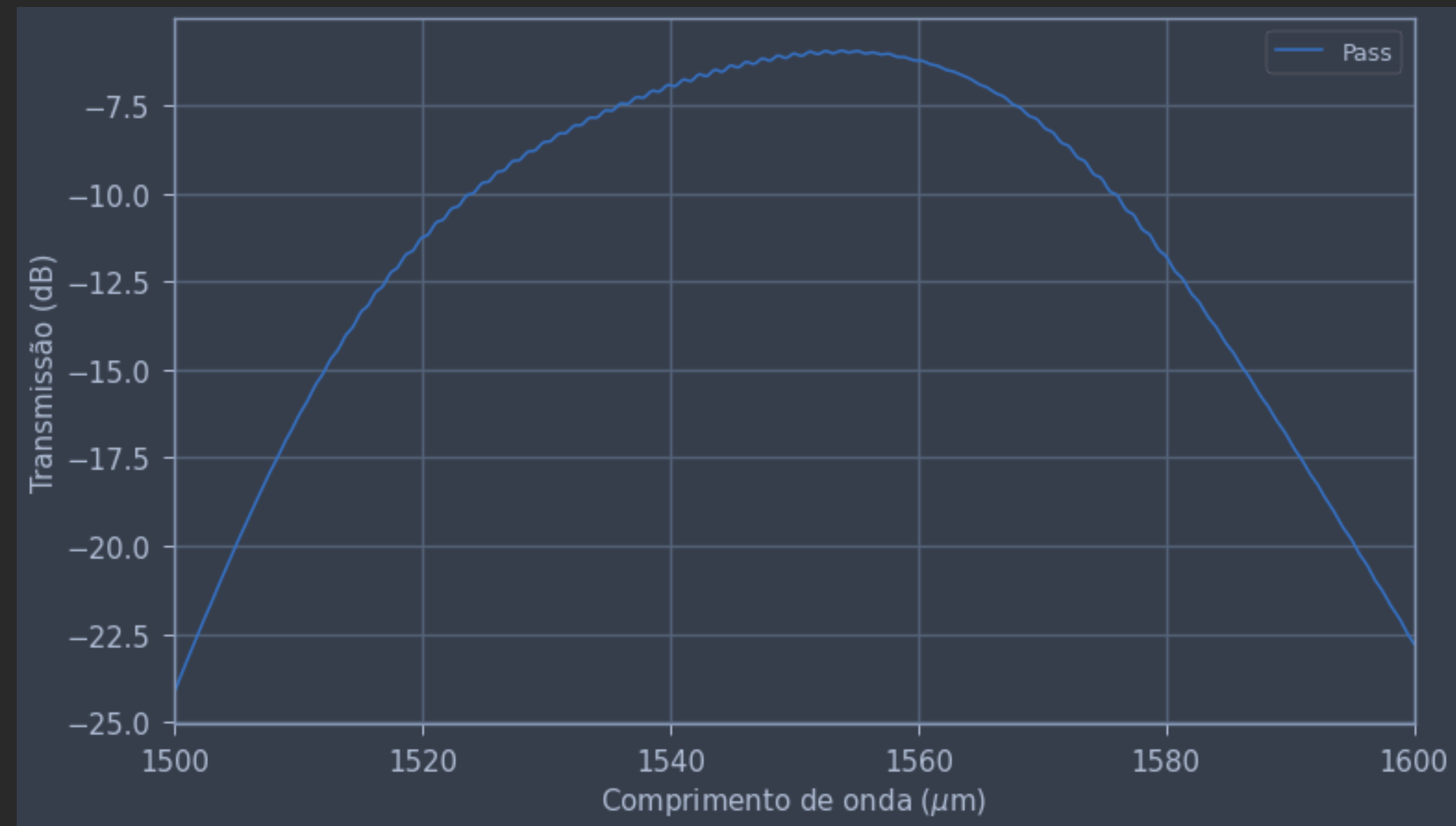
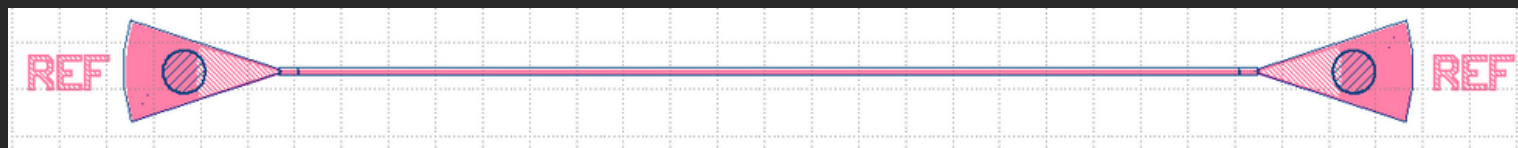
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Pass em cascata



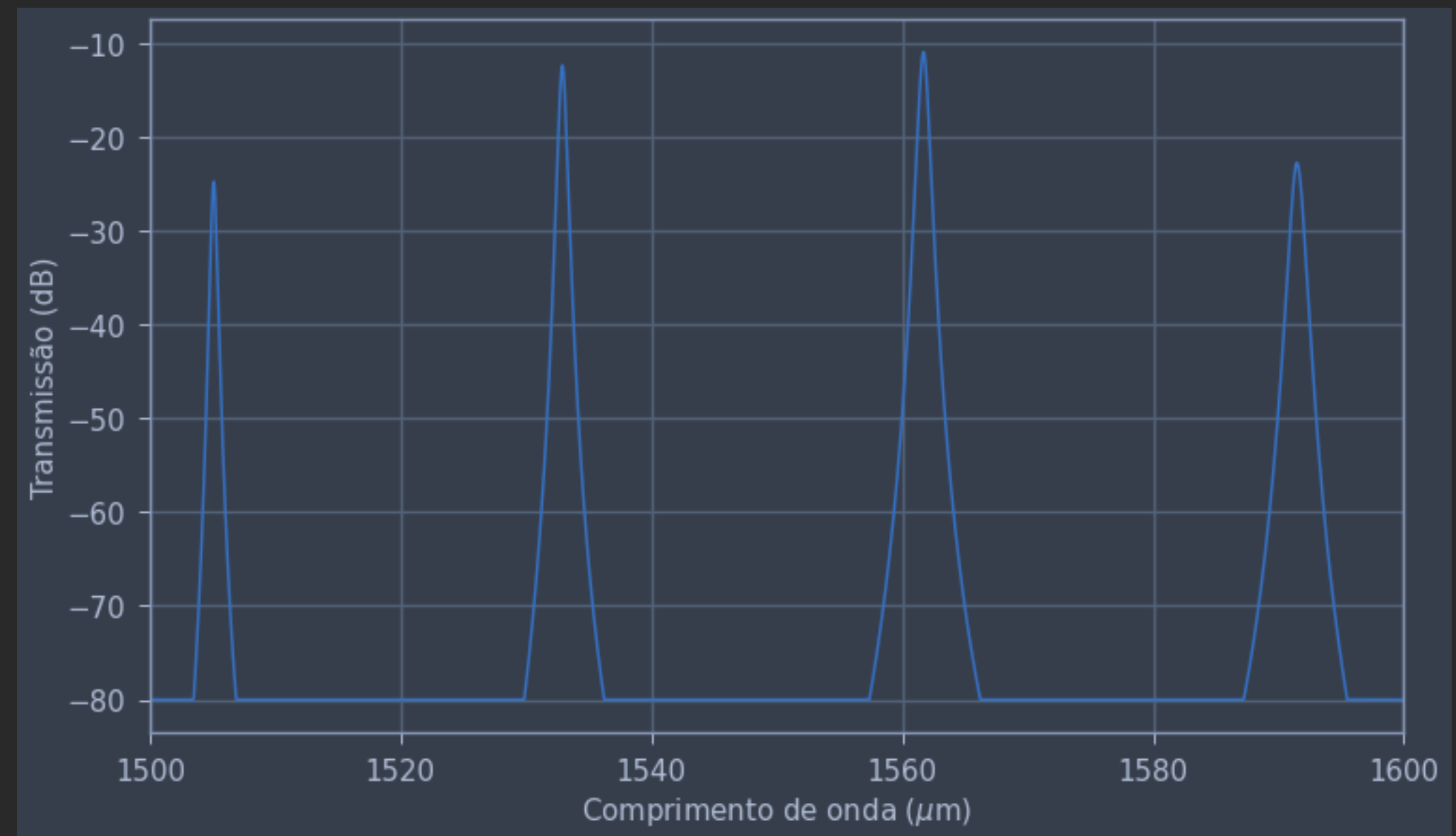
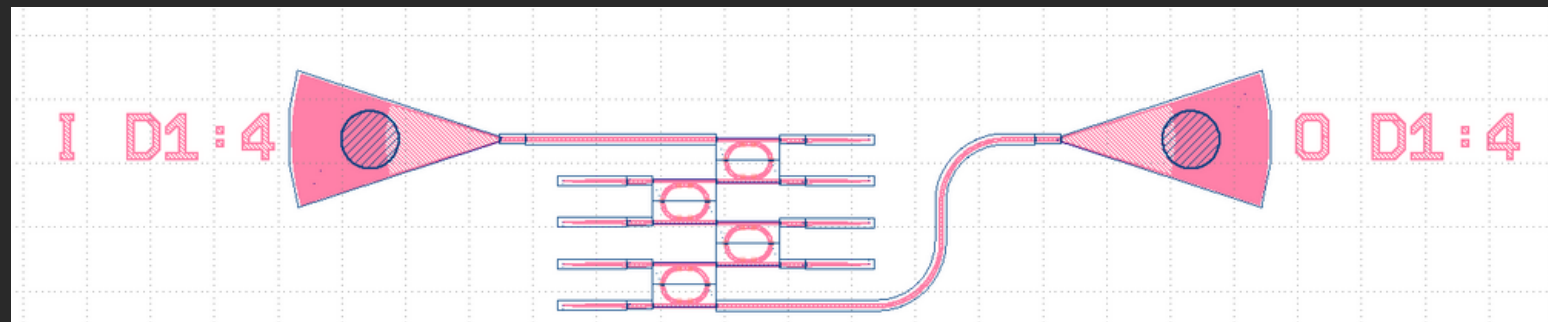
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Pass em cascata



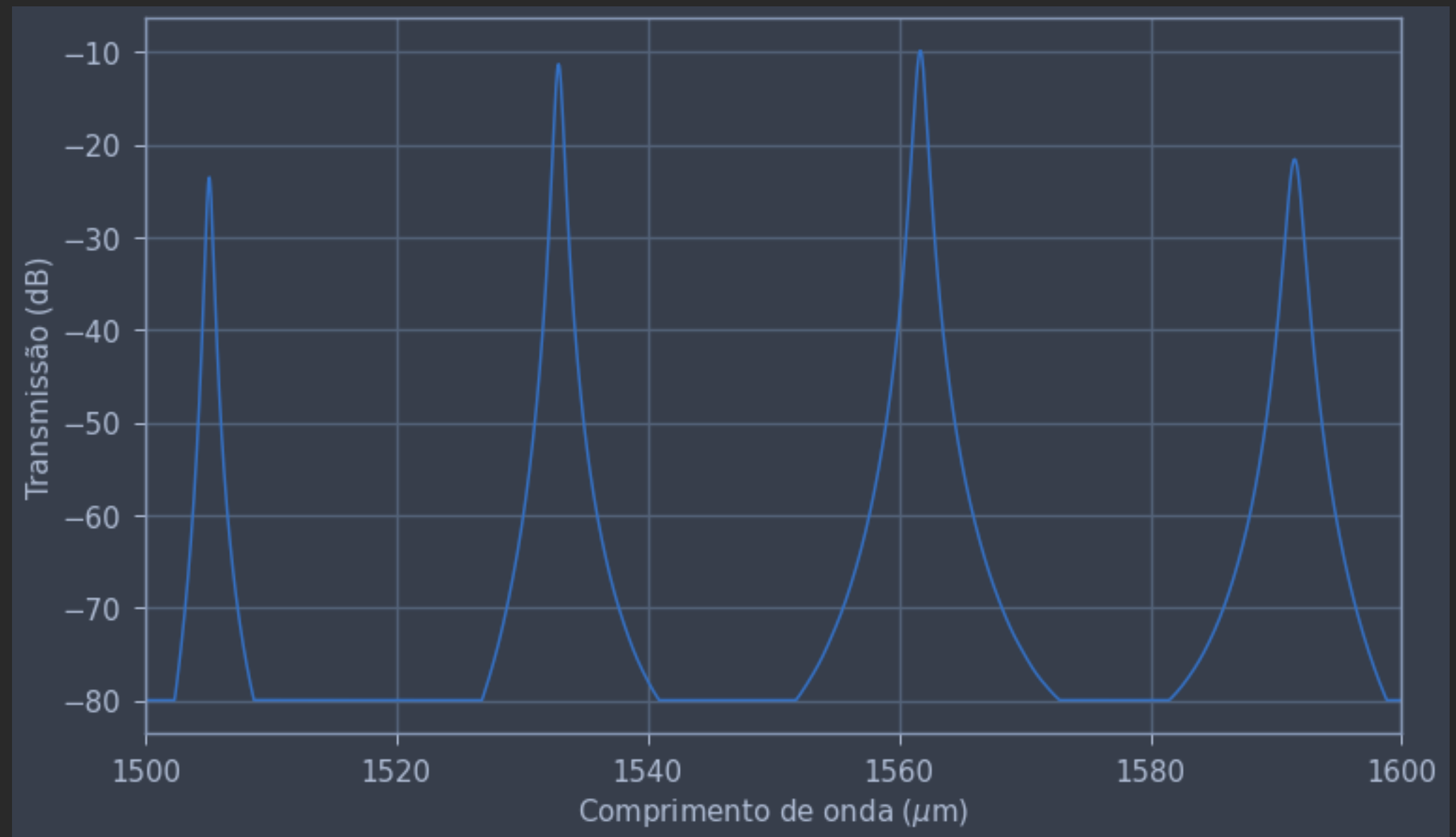
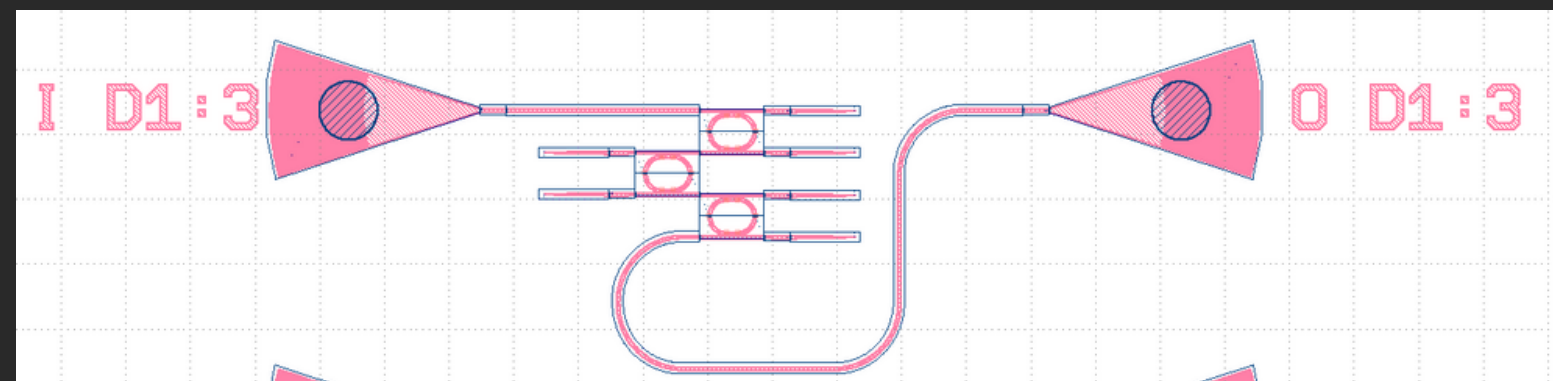
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Drop em cascata



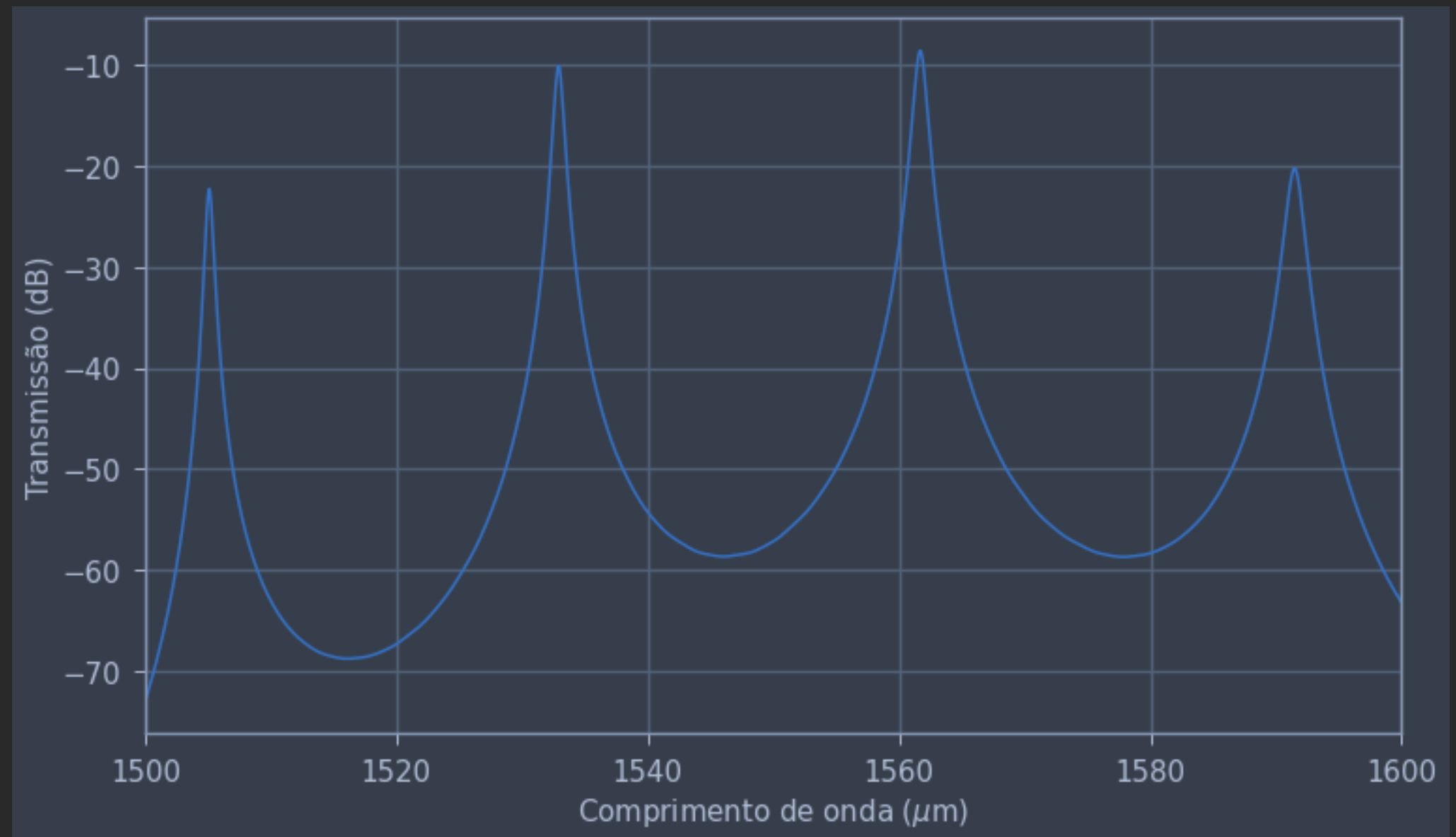
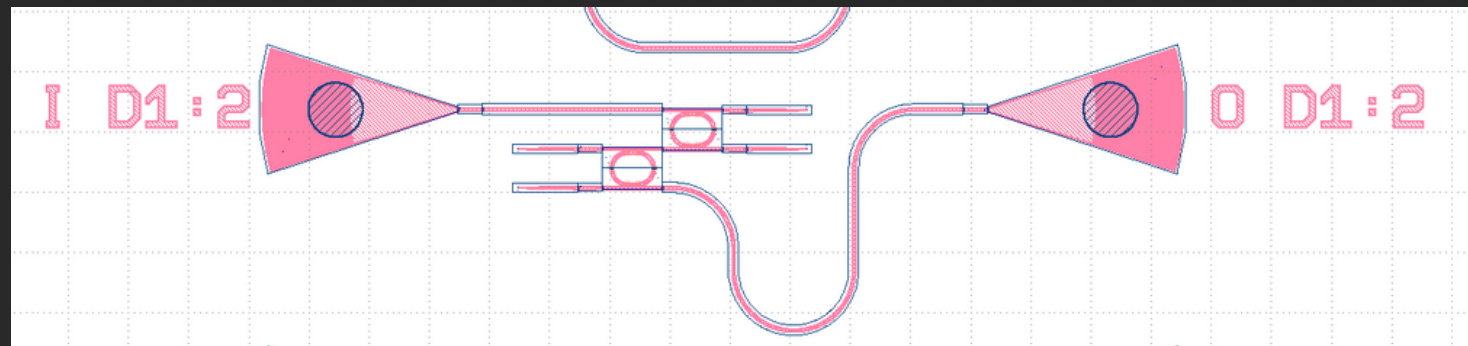


# DESIGN DE UM ANEL DE RESSONÂNCIA porta Drop em cascata



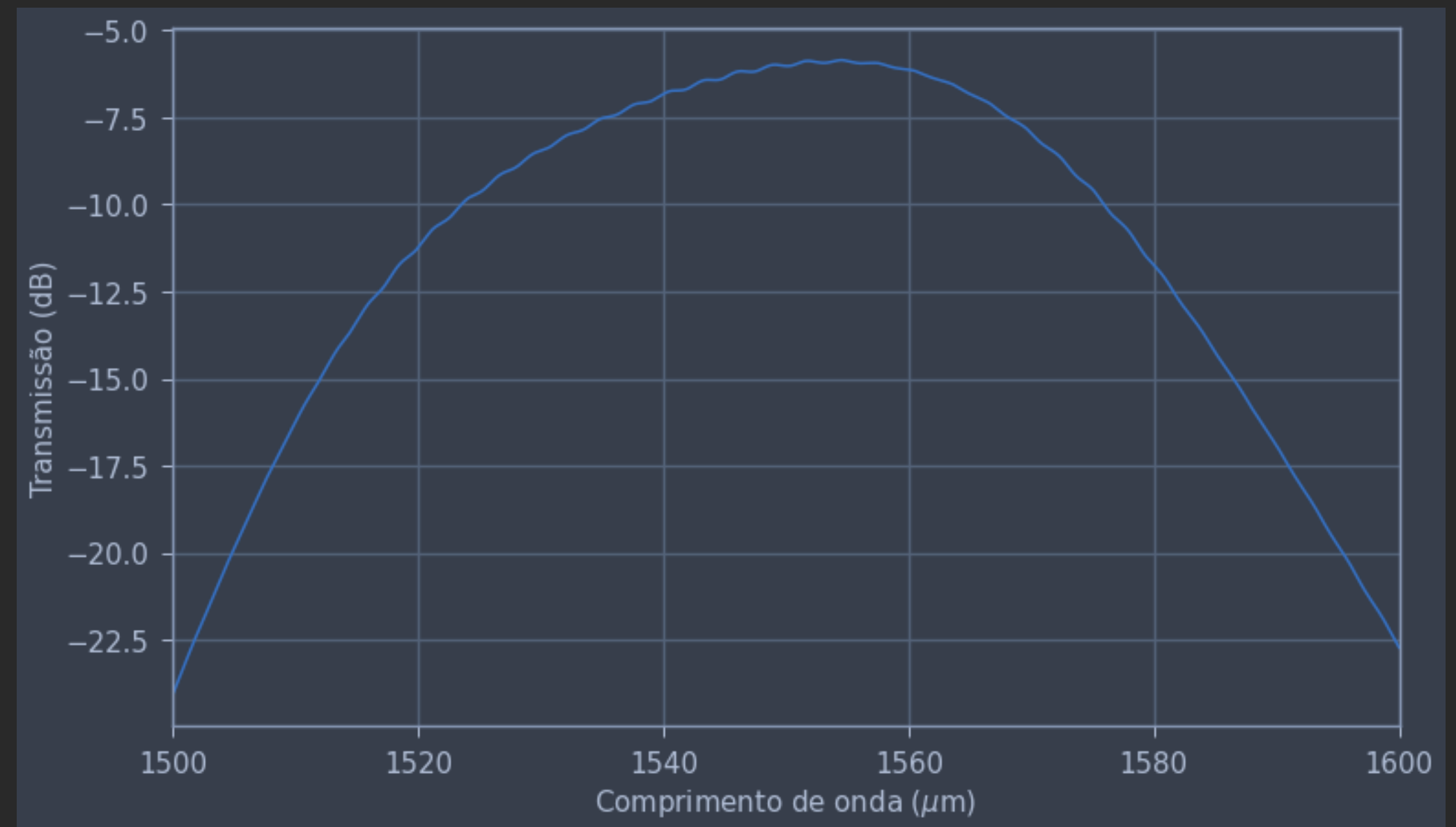
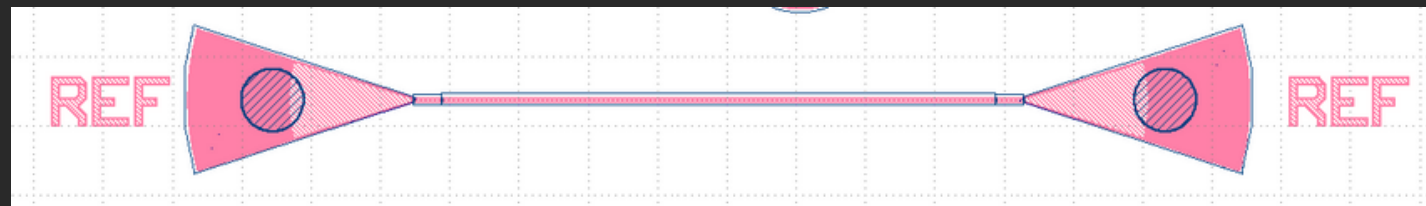


# DESIGN DE UM ANEL DE RESSONÂNCIA porta Drop em cascata



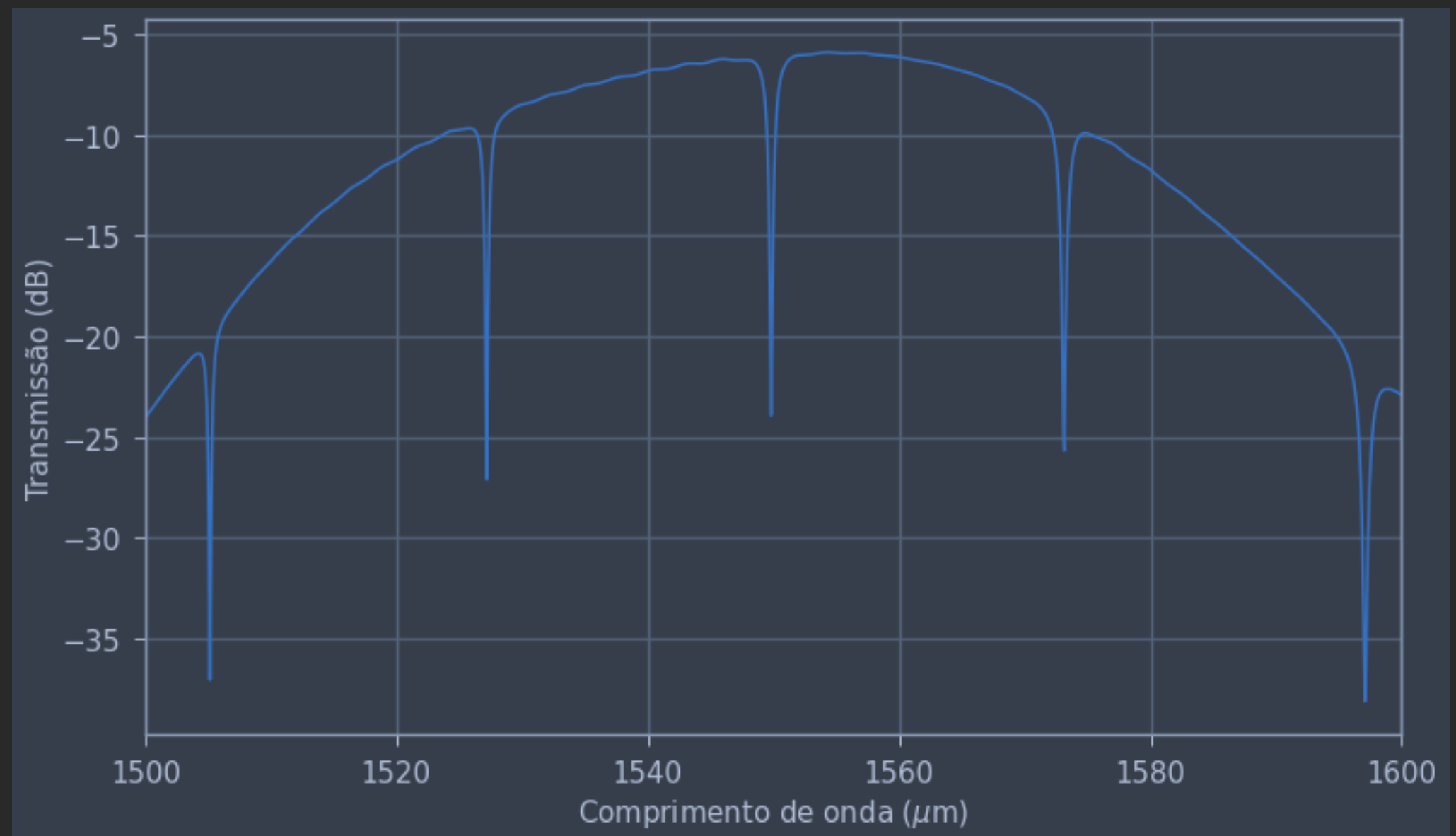
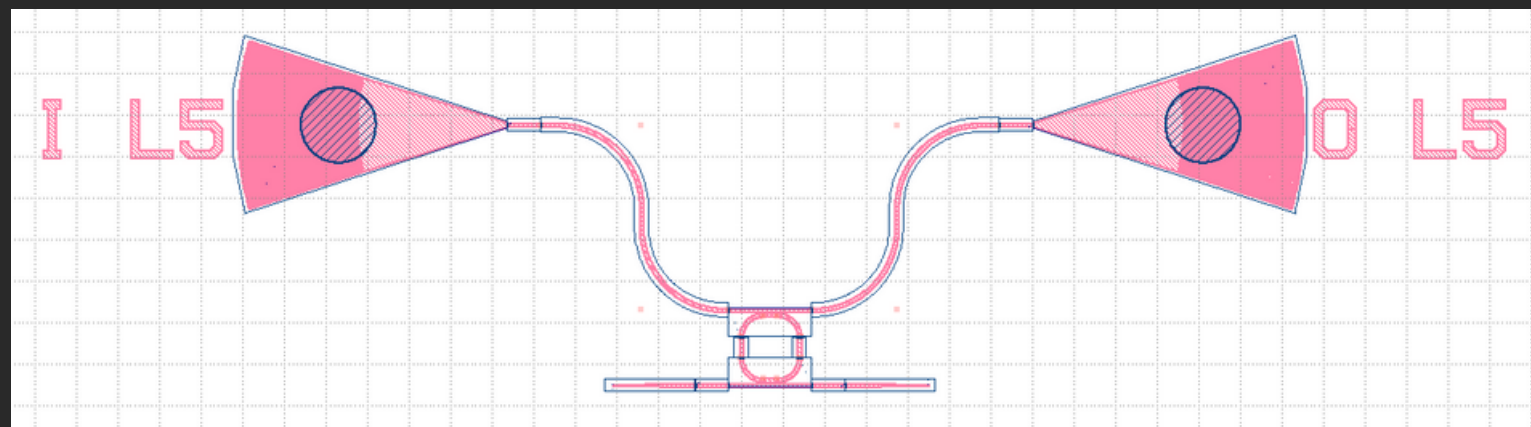
# DESIGN DE UM ANEL DE RESSONÂNCIA

## porta Drop em cascata



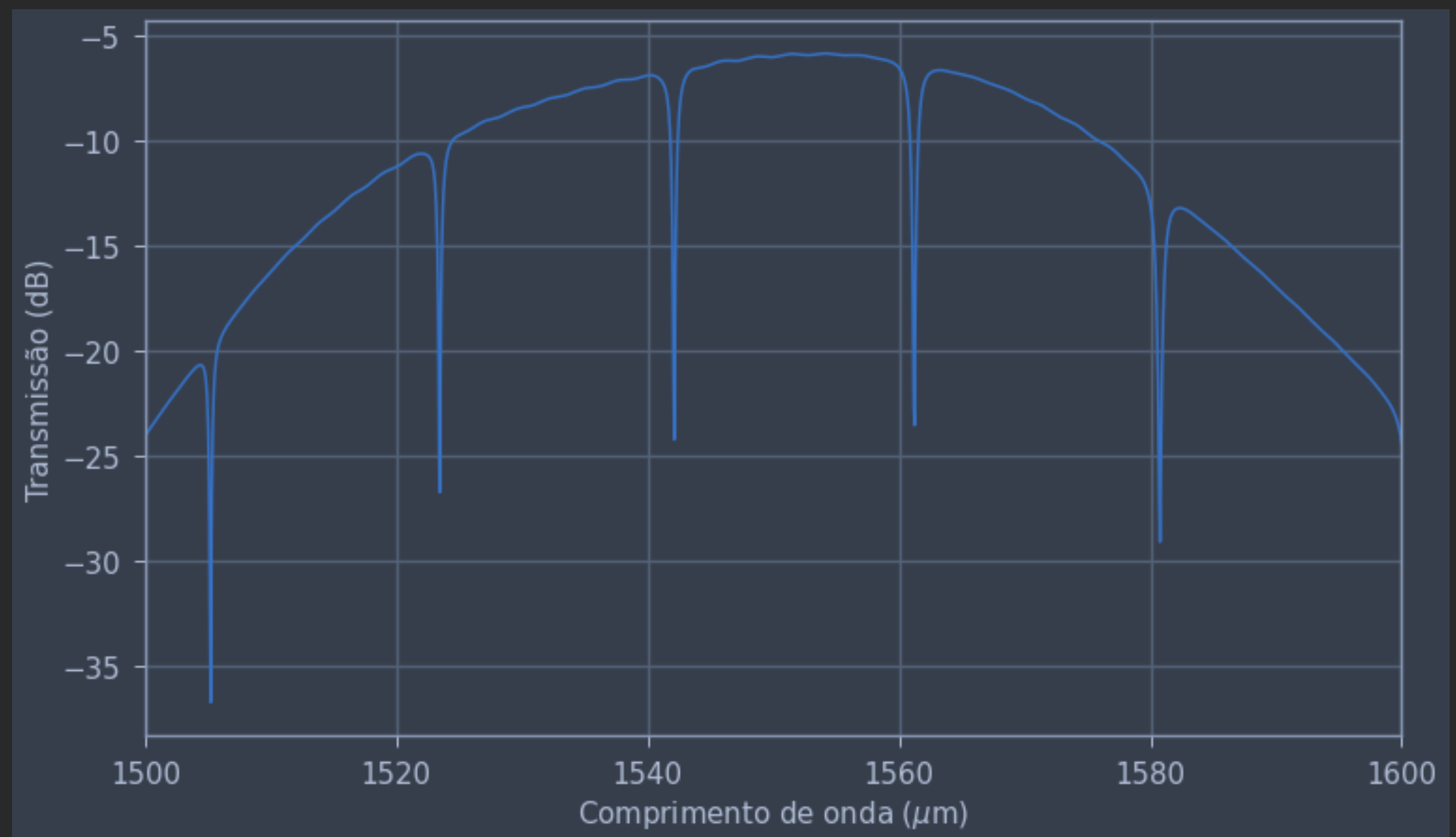
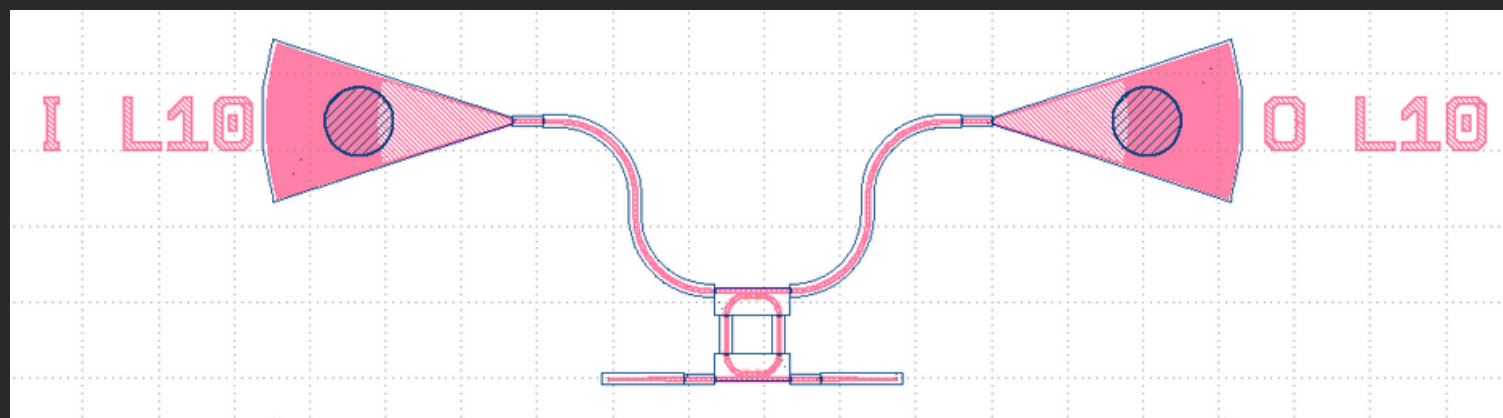
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Aumento do comprimento do anel



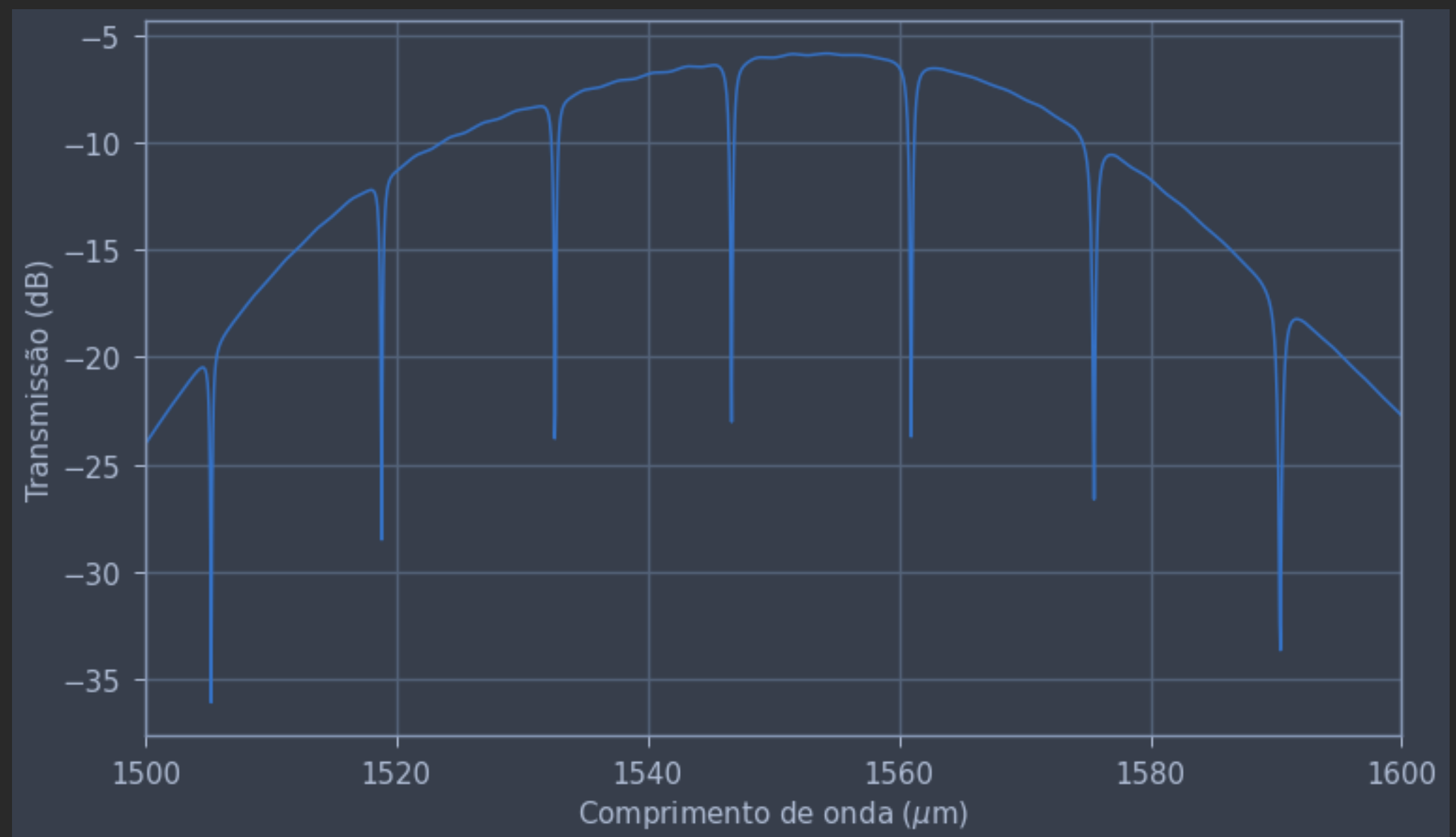
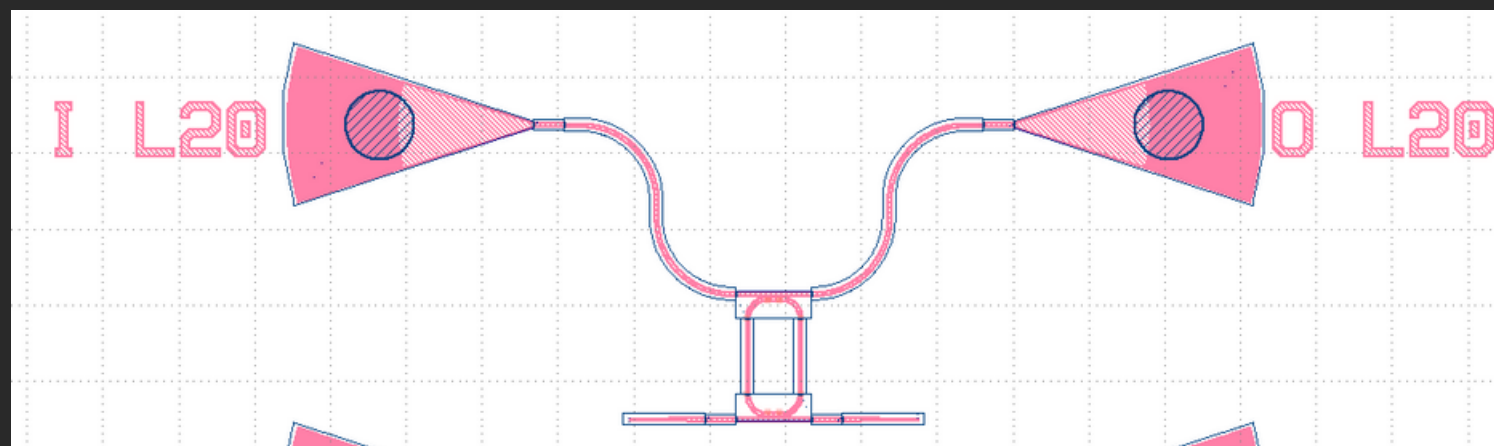
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Aumento do comprimento do anel



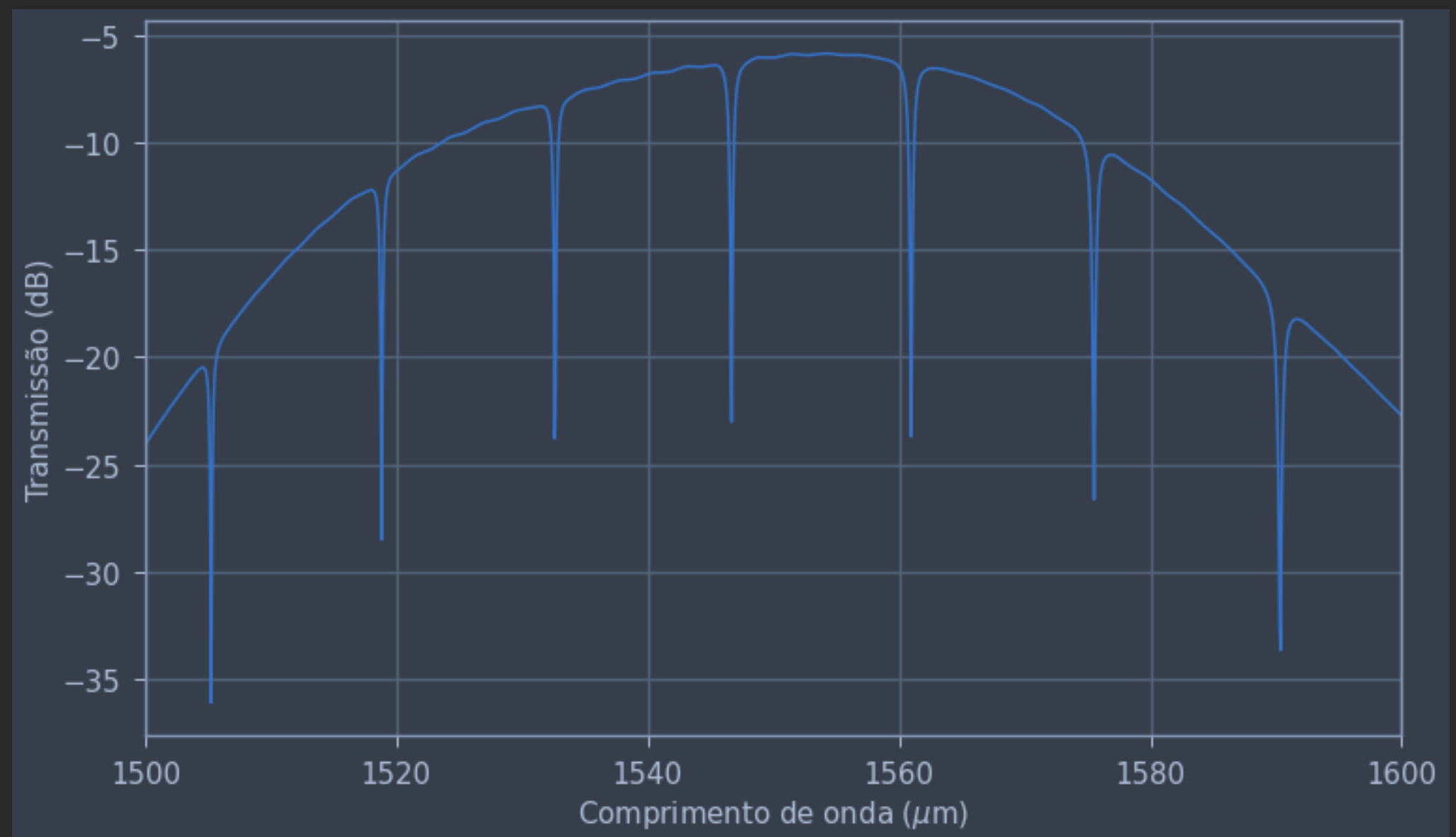
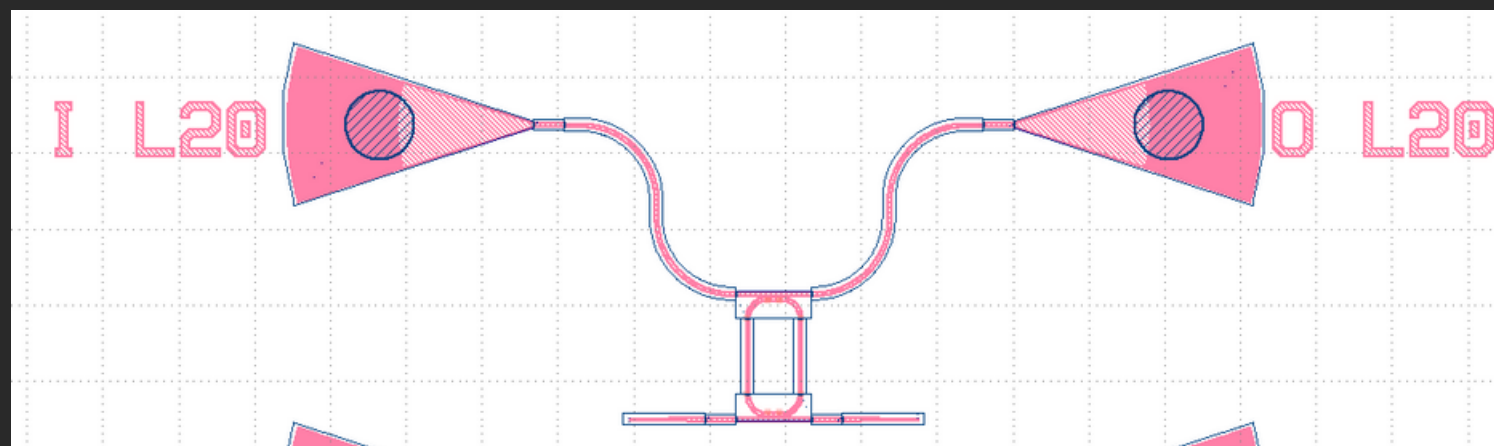
# DESIGN DE UM ANEL DE RESSONÂNCIA

## Aumento do comprimento do anel



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Aumento do comprimento do anel



# DESIGN DE UM ANEL DE RESSONÂNCIA

## Aumento do comprimento do anel

