Bragg Grating

Week 3

By: Leonardo Pessôa

OBJECTIVES

- Verify the gratting results changes with diferent parameters
- Verify how the lenght impact the gratting.

CONSTANT VALUES

Using Lambda = 1550nm and 25nm FWHM

Using FDE solver on an straight 0.22um tall, 0.45um thickness waveguide, we can get the constants we need to start projecting the gratting.

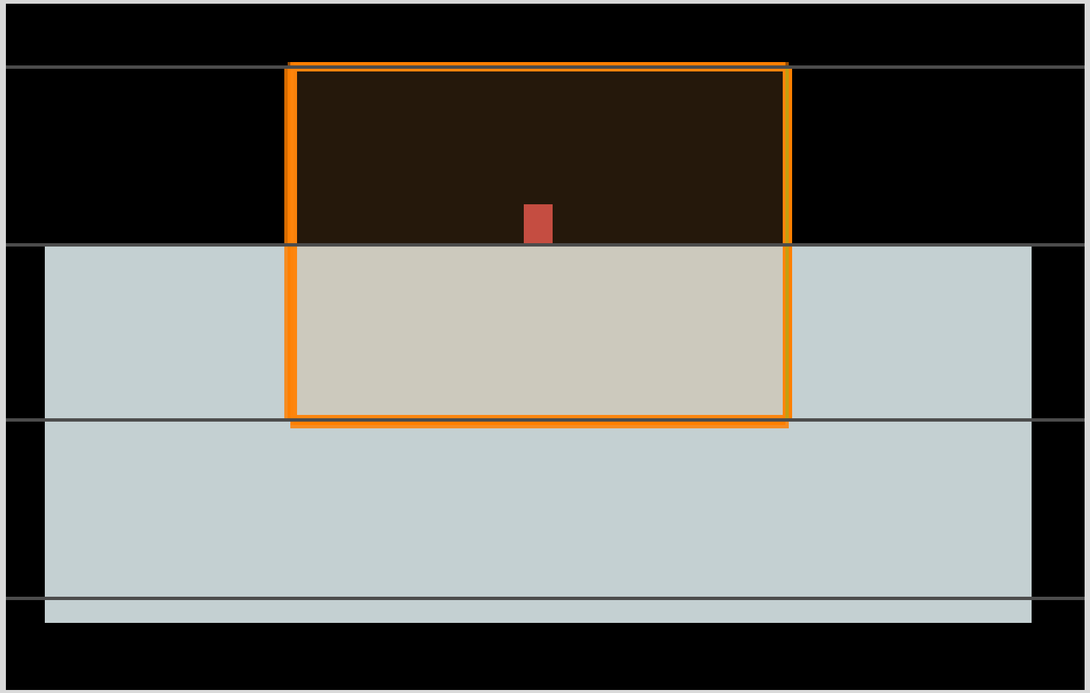
Neff = 2.27;

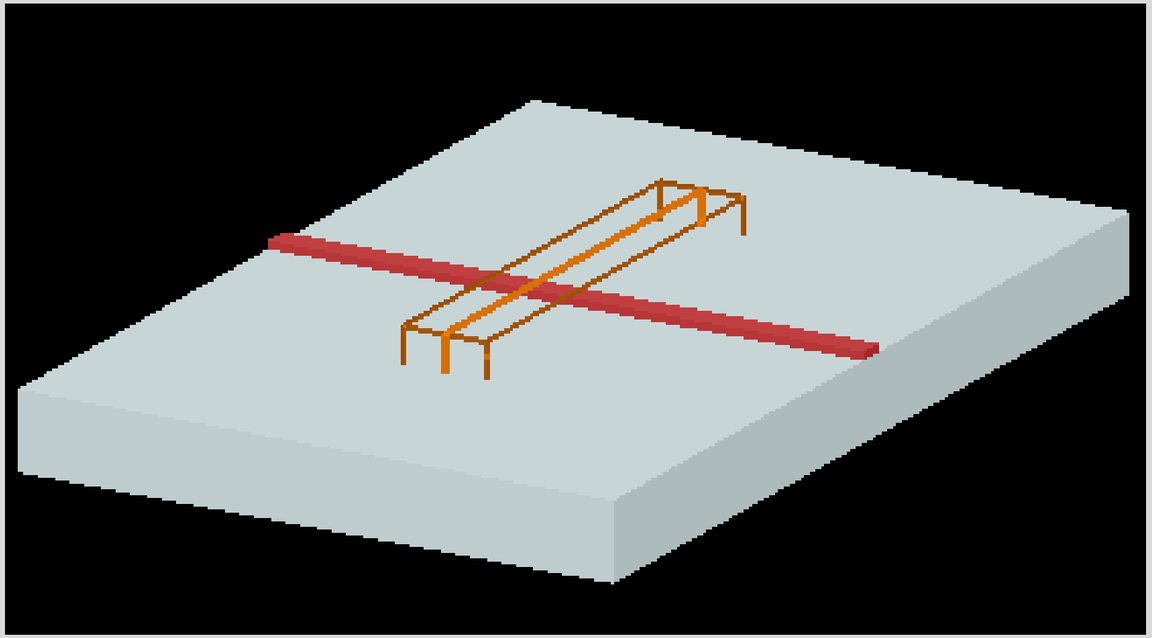
Ng = 4.60;

Grating Period = 341.41nm.

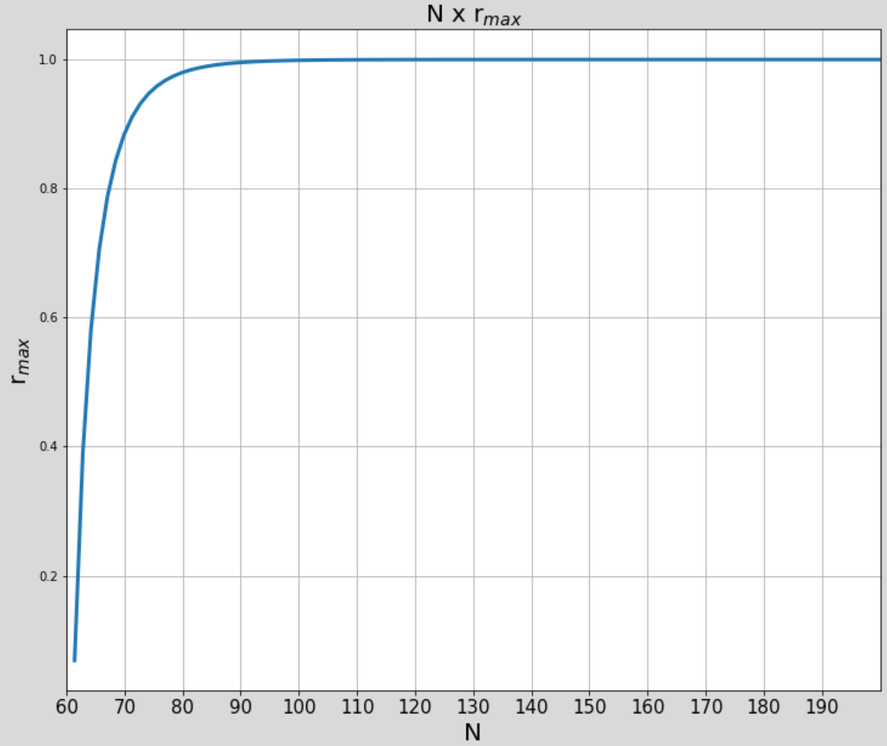
CONSTANT VALUES

Mode





CALCULATING THE NUMBER OF PERIODS



Used value:

N = 120

Theoretical results:

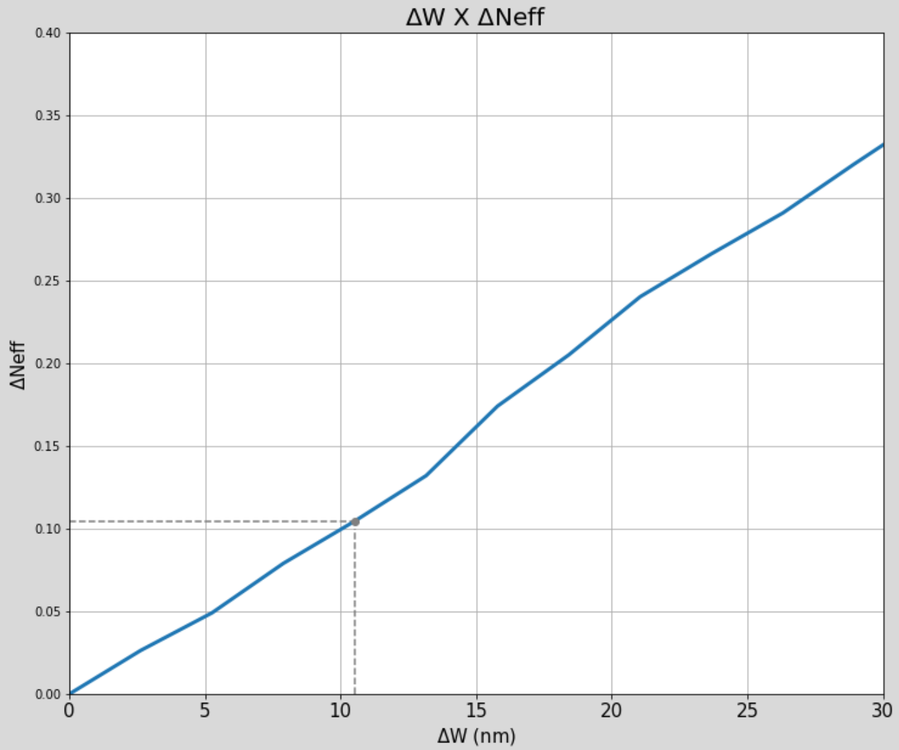
rmax = 1

L = 40.97um

ΔNeff = 0.1

ΔW X ΔNEFF

Finding the ΔW to be used on the gratting

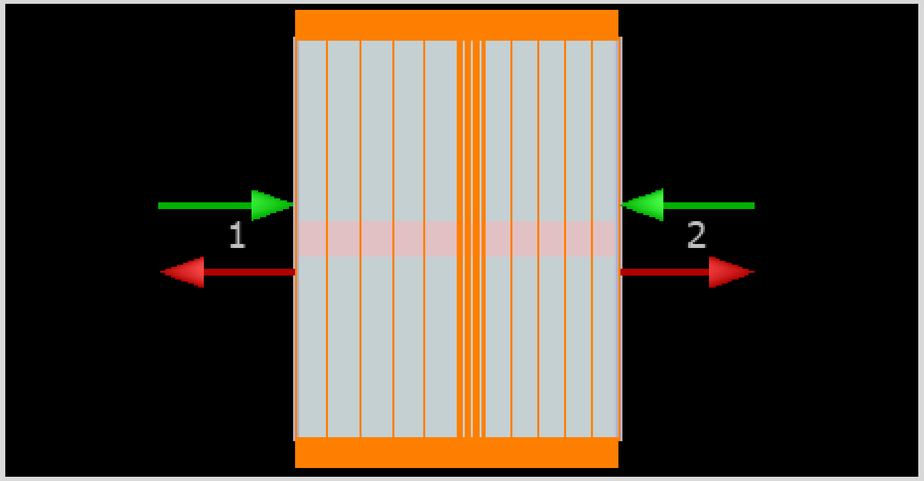


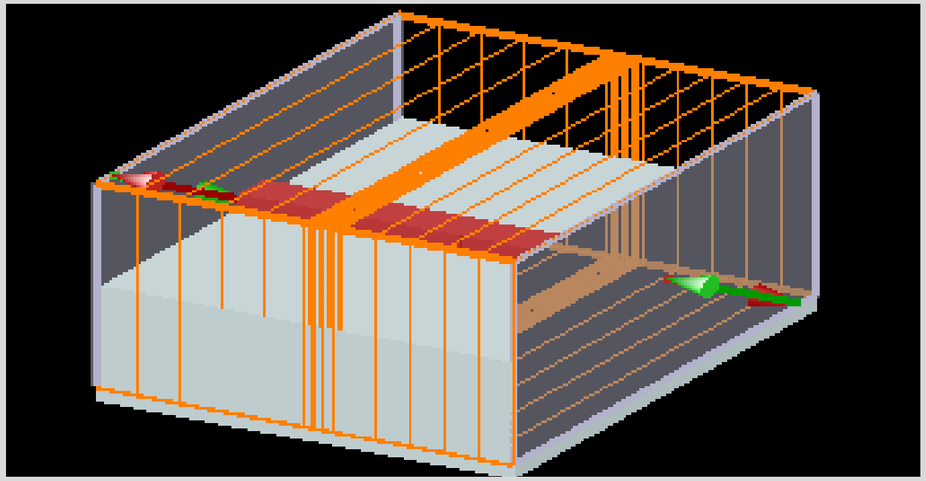
With ΔNeff = 0.1 we have:

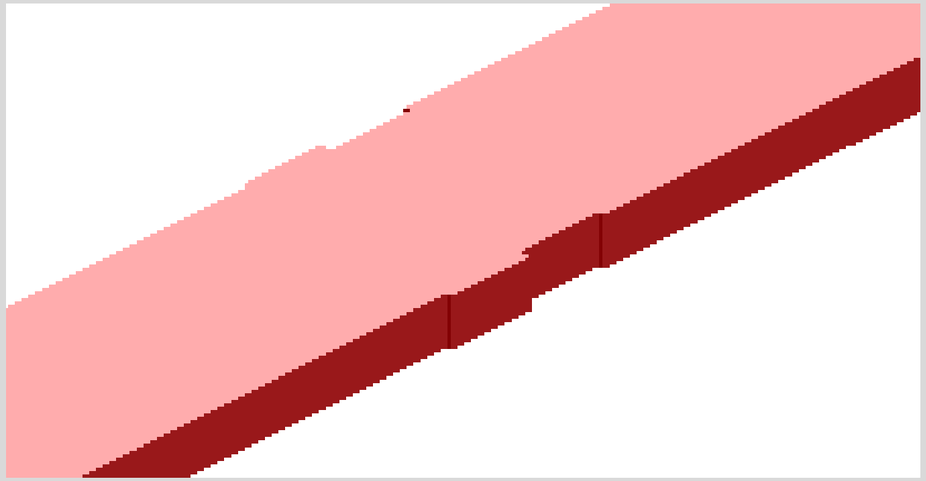
ΔW = 10.53nm

DESIGN

Lumerical mode

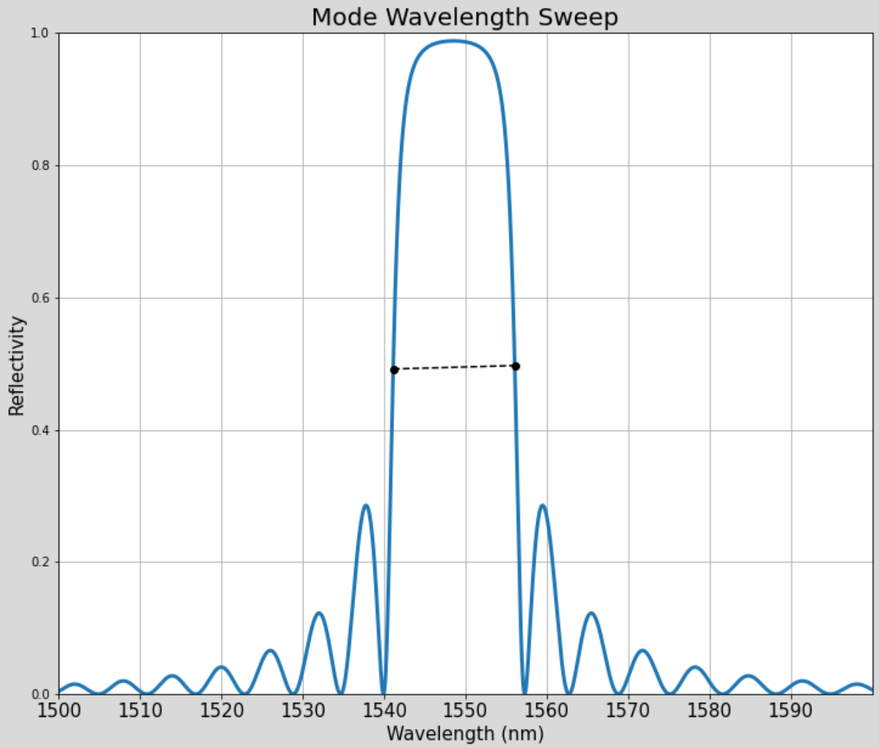


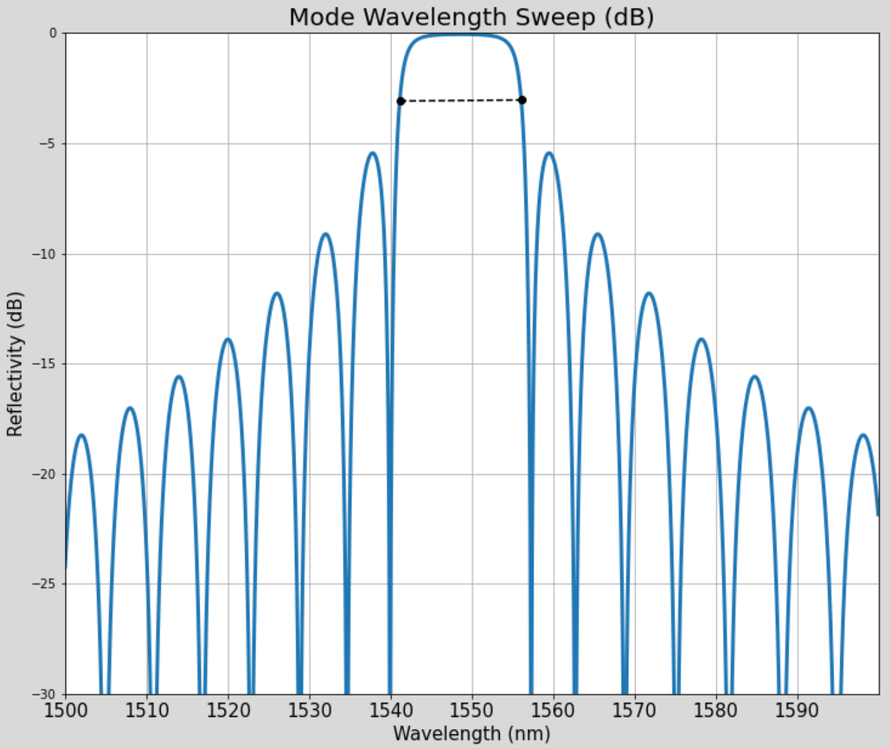




MODE GRAPHICS

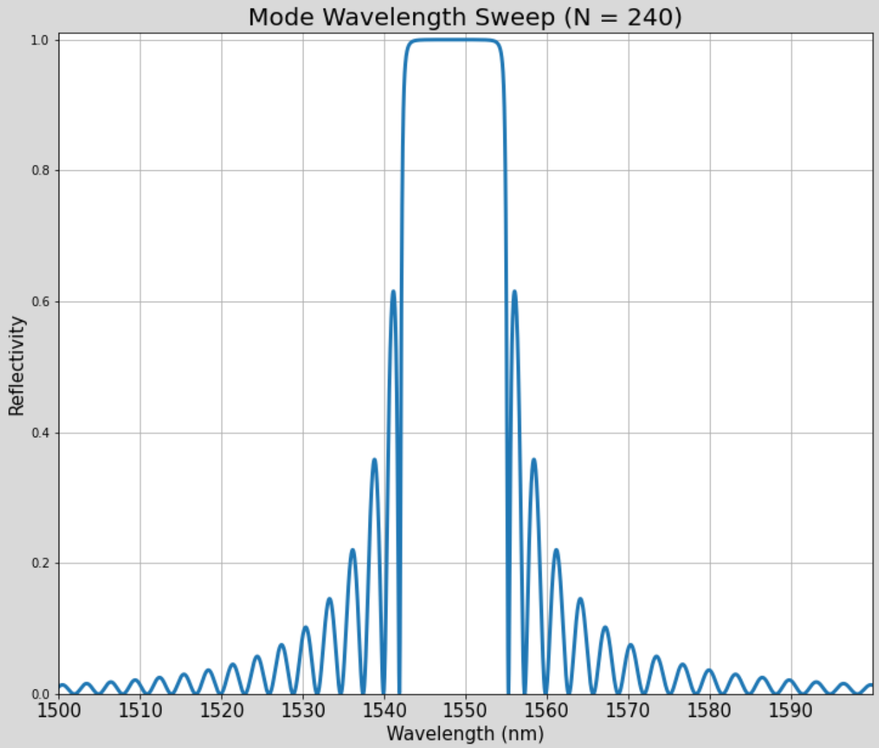
N = 120 (FWHM = 15nm)

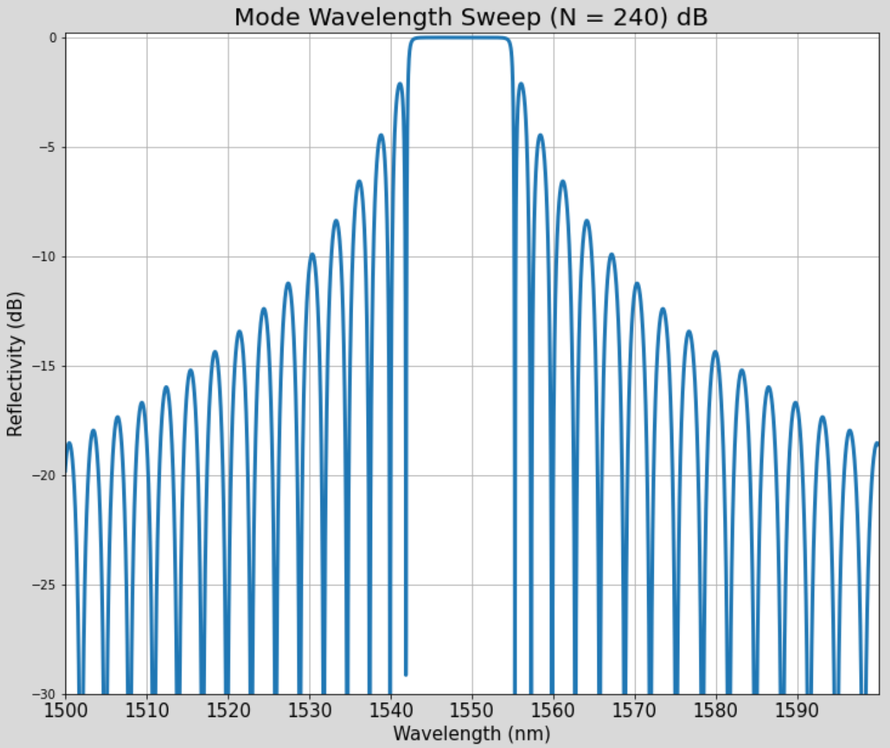




MODE GRAPHICS

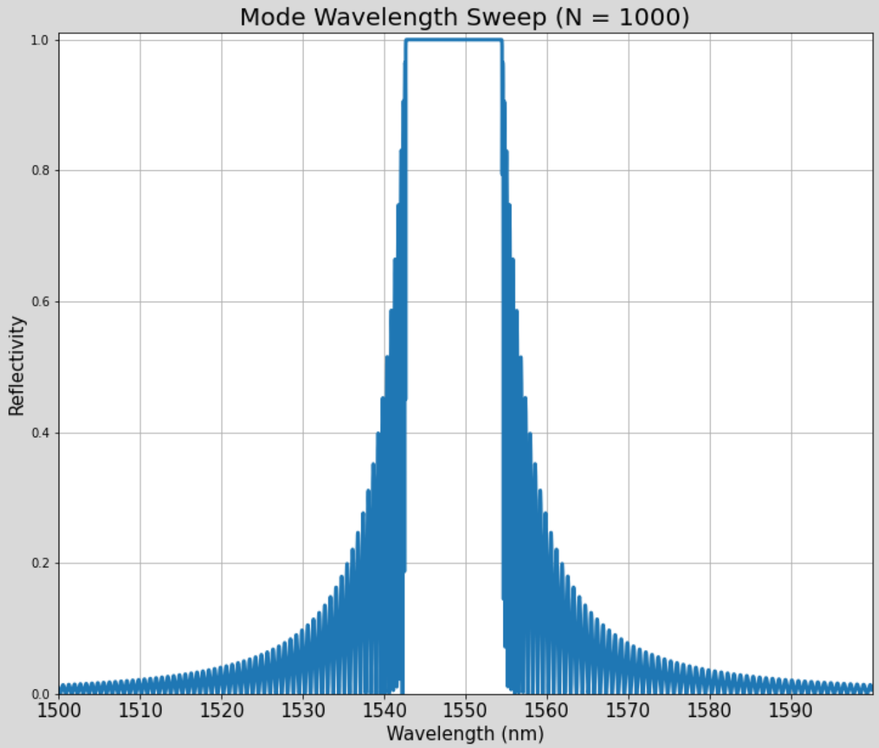
N = 240

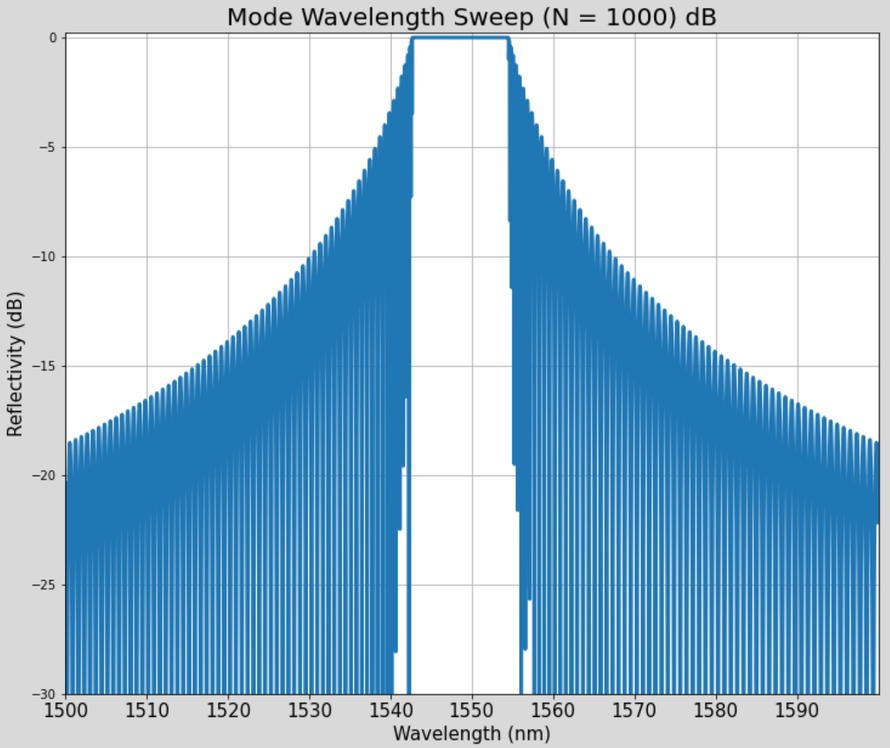




MODE GRAPHICS

N = 1000





CONCLUSION

As we can see, when we increase the number of periods the filter noise increase as well.

The FWHM value of the design is way lower than the expected one.