ELEC 413 Draft Report

First I simulated a 350x220nm waveguide on MODE to calculate group index and effective index.

mode #	effective index	wavelength (μm)	loss (dB/cm)	group index
1	2.434847+1.584126e-09i	1.31	0.00065995	4.506490+3.725176e-09i

I transferred that data to Matlab to get the polynomial constants which were used when simulating a Bragg grating waveguide using TMM

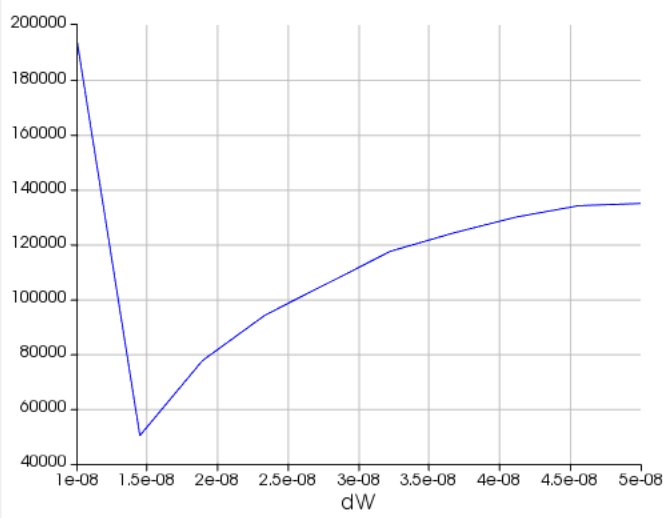
Next I simulated a Bragg grating using FDTD to calculate the Bragg wavelength and bandwidth as well as plotting kappa vs dW.

1st largest peak is at wavelength = 1.29979e-06

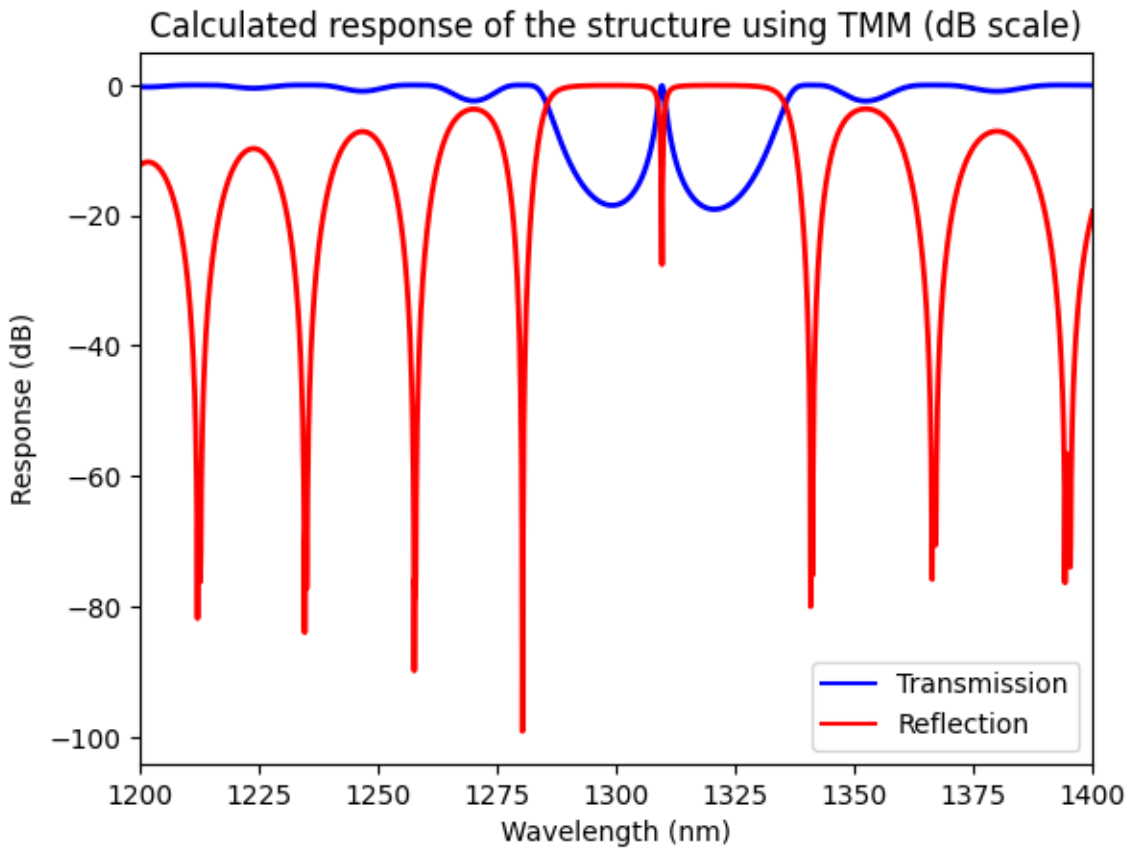
2nd largest peak is at wavelength = 1.31654e-06

Bragg wavelength = 1308.17 nm

Delta lambda = 16.7508 nm

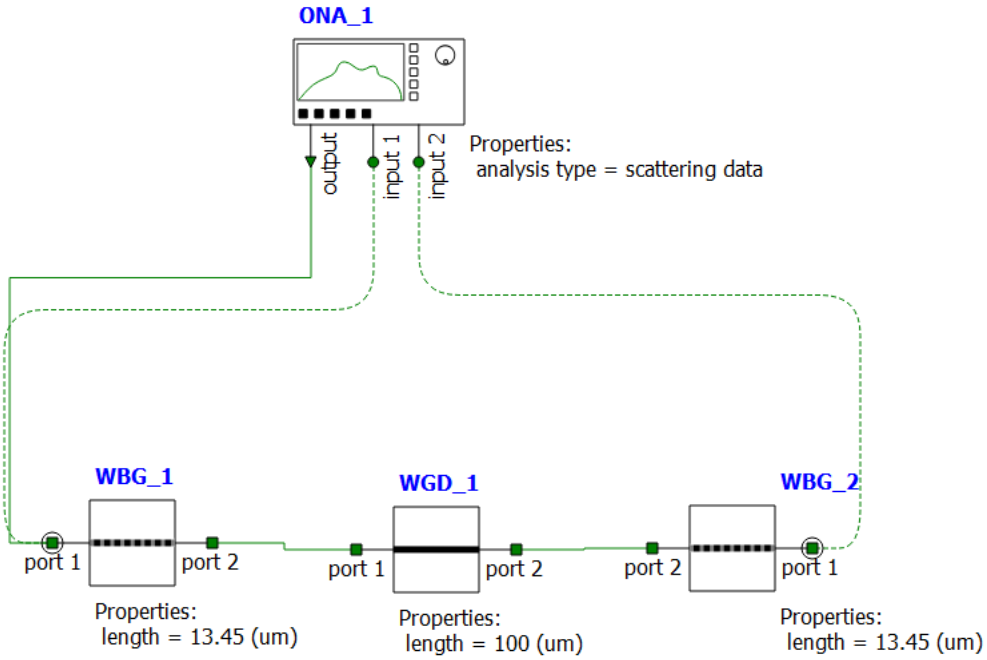


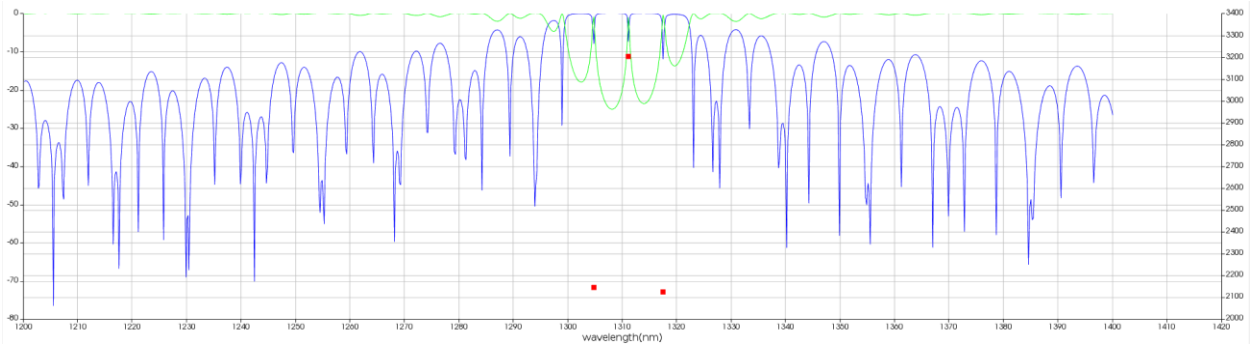
Next, I used TMM using a Python script to simulate the Bragg grating by using the values calculated in previous simulations such as kappa and effective index.



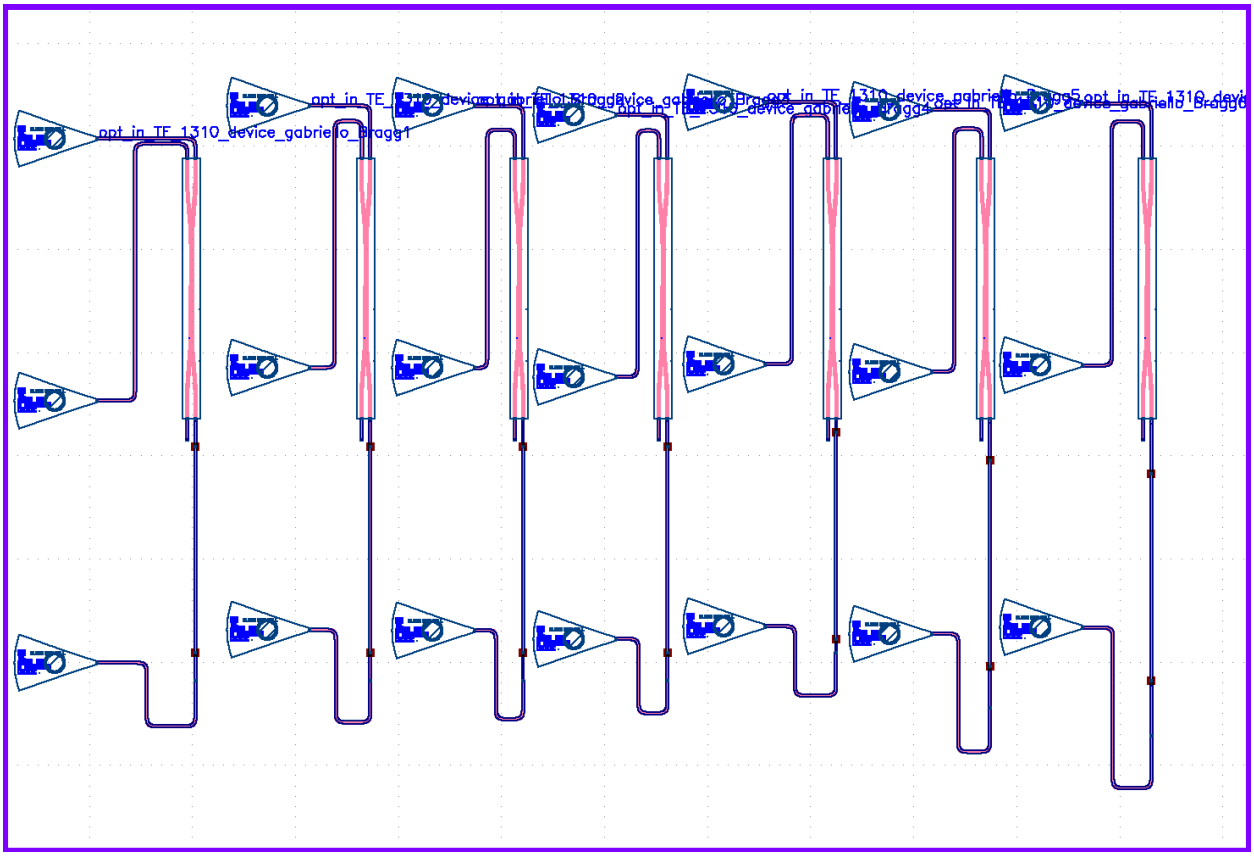
I experimented with various parameters such that the peak transmission is around -20 dB.

After that, I simulated a Bragg grating resonator in INTERCONNECT and experimented with different parameters, mainly changing dW and number of periods, to see which gave the highest quality factor.





Finally, using Klayout, I made various designs of a Fabry Perot resonator while changing parameters.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