

Bragg Grating

Week 4

By: Leonardo Pessoa

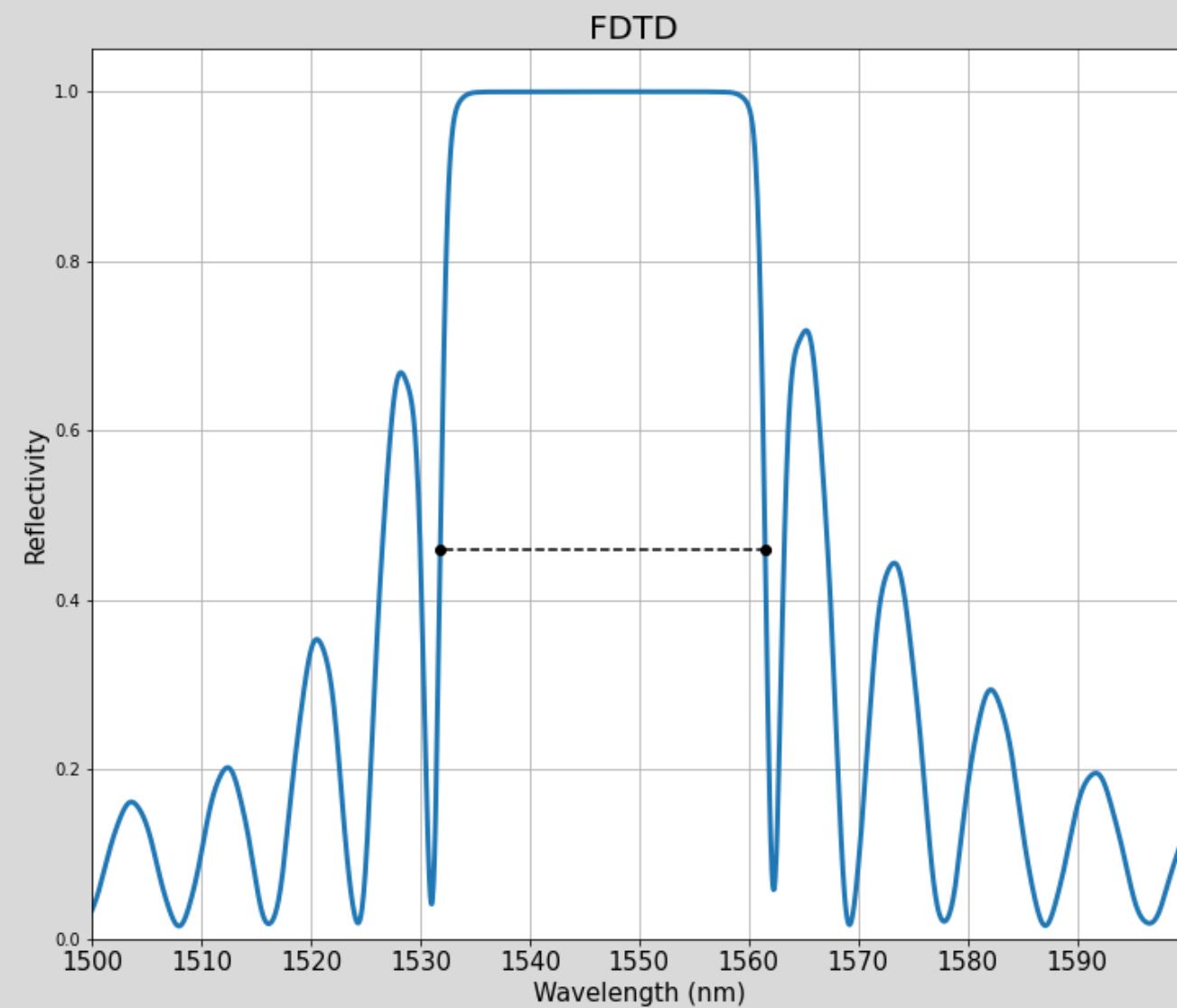
OBJECTIVES

- Generate the guide on FDTD and compare the results with EME.
- Verify how lithography filter impact the guide.

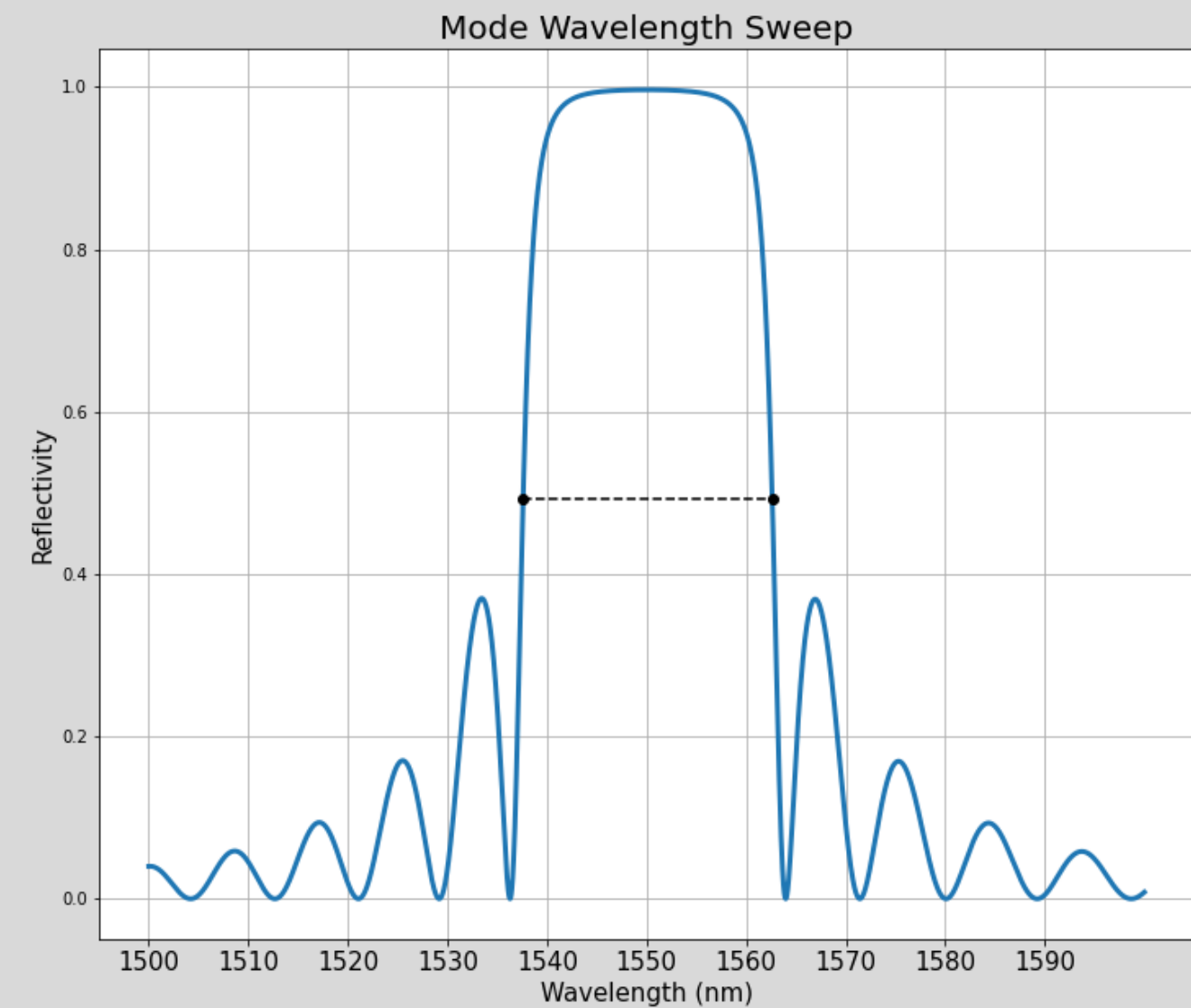
USING THE 0.45NM GUIDE

FDTD vs EME results

$N = 82$, $L = 28.24\mu\text{m}$, grating period = 344.377nm , $\Delta W = 24\text{nm}$



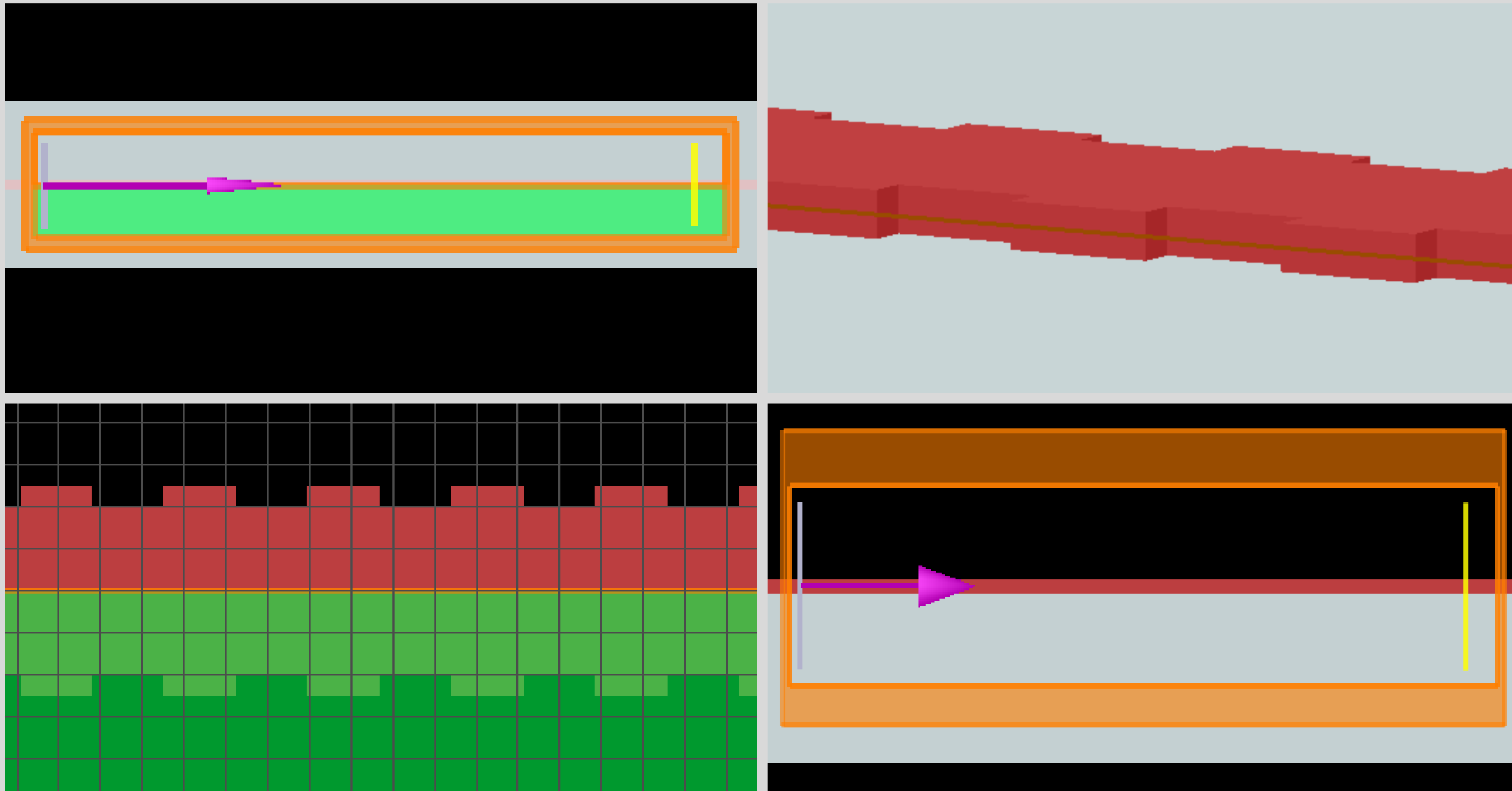
$\lambda_B = 1547.41\text{nm}$, FWHM = 29.6658nm



$\lambda_B = 1550.01\text{nm}$, FWHM = 25.025nm

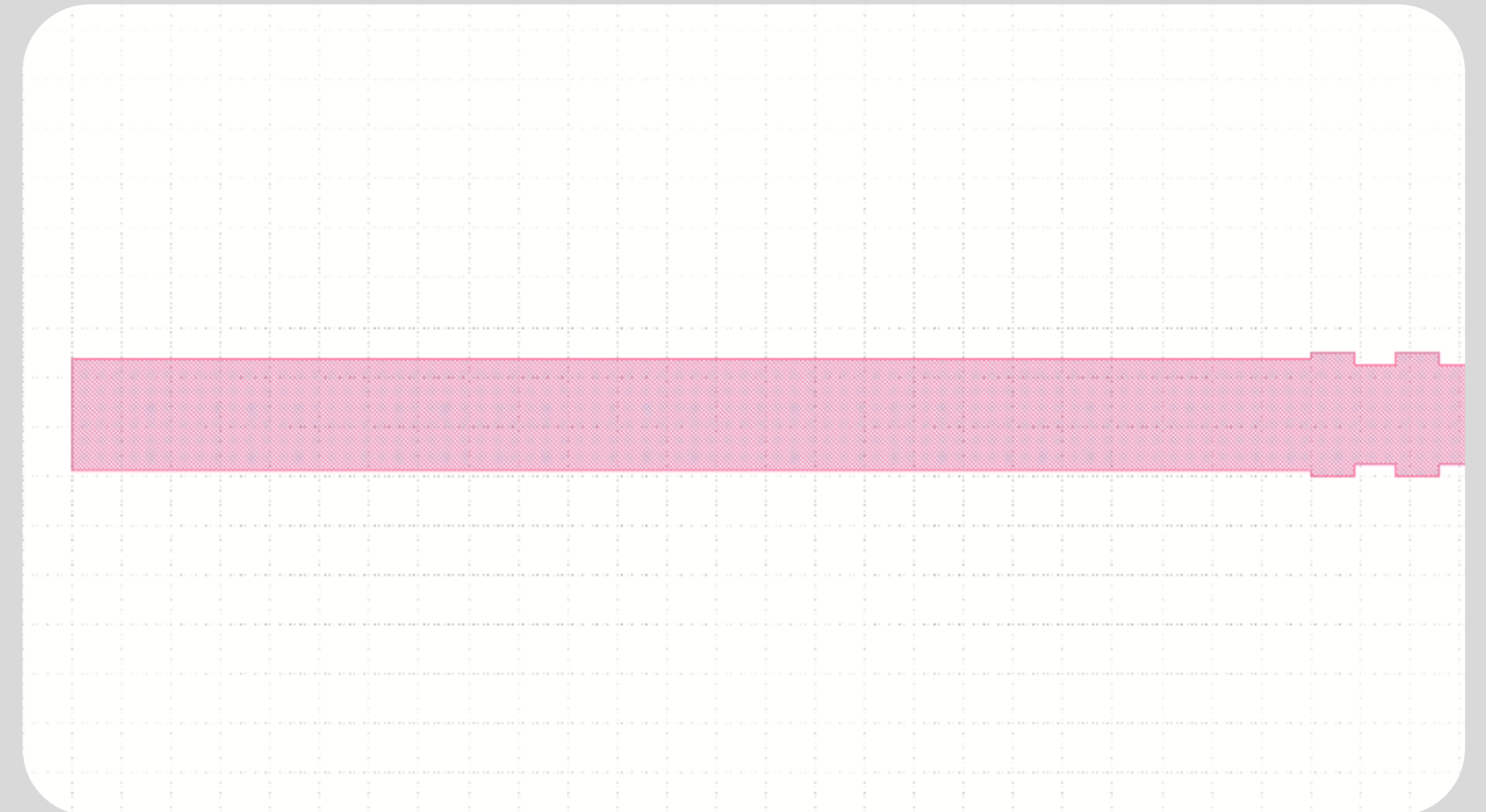
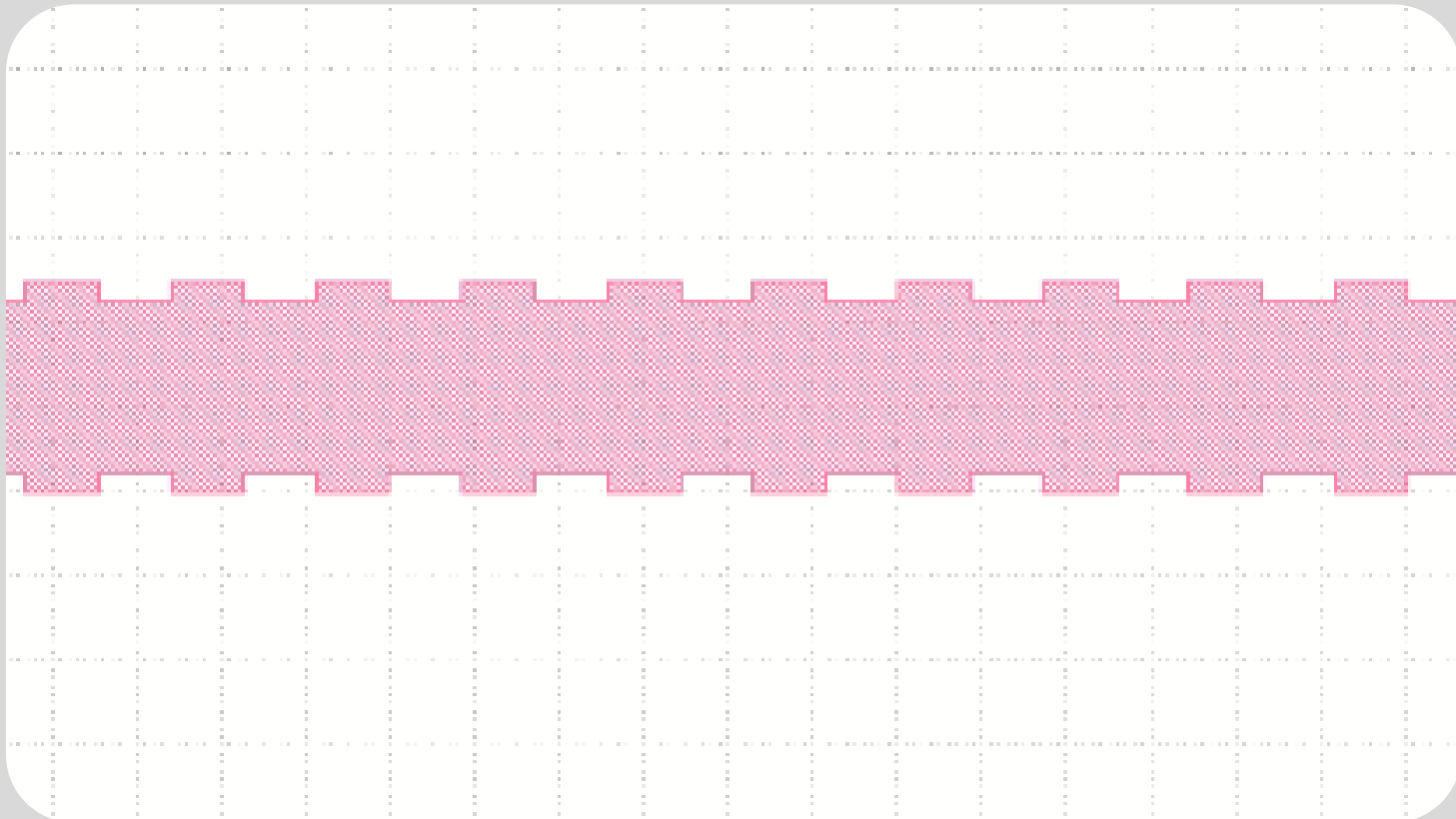
DESIGN

Lumerical FDTD



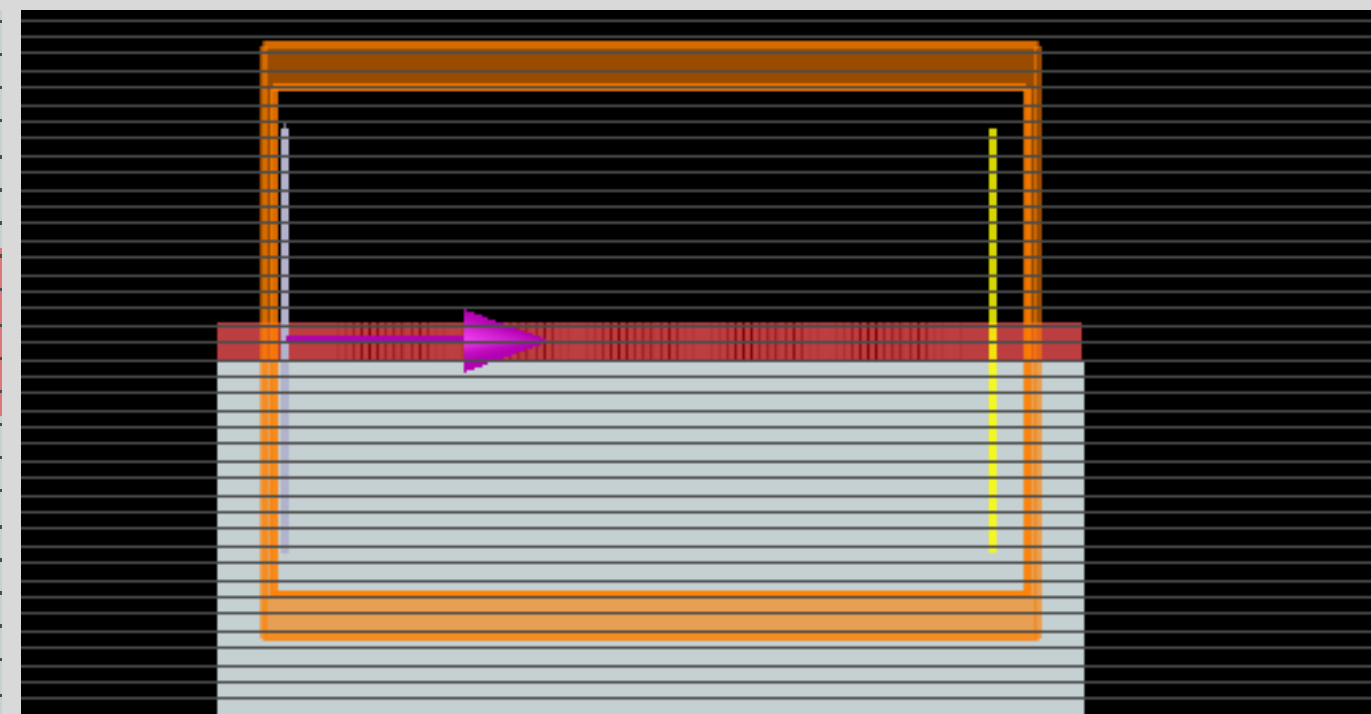
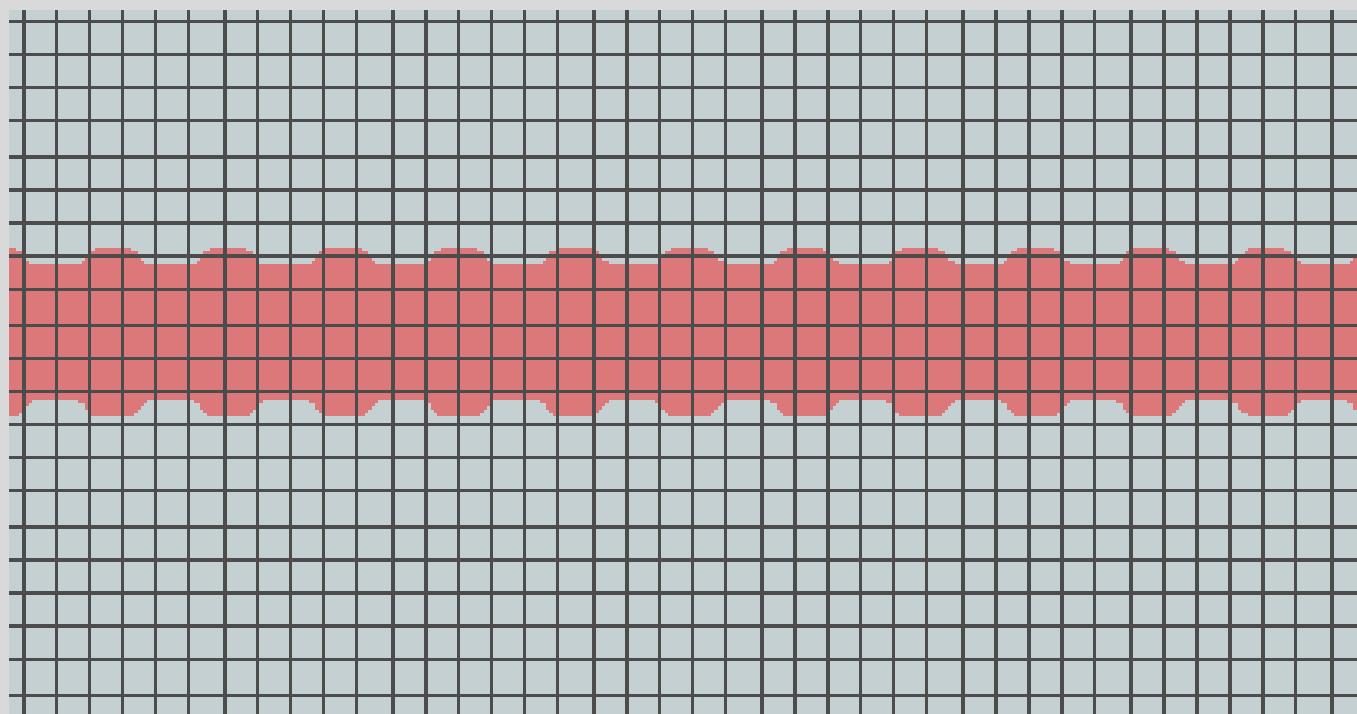
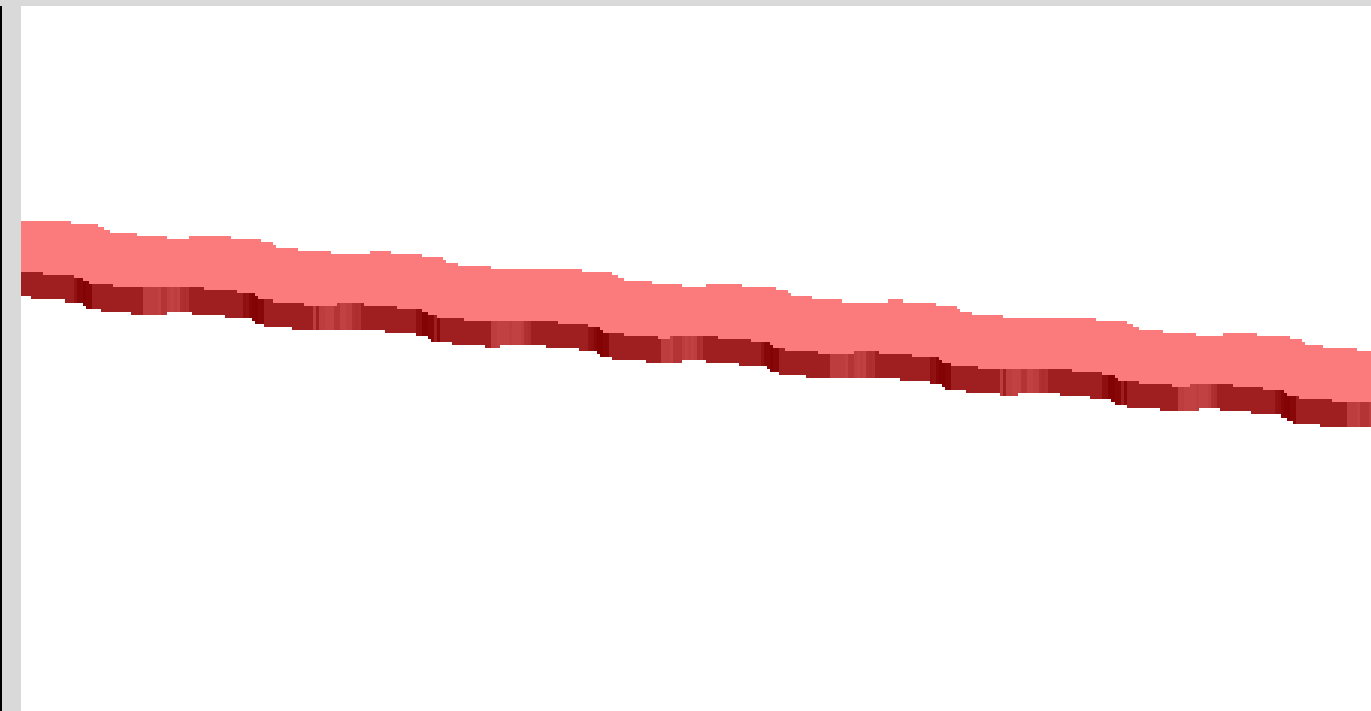
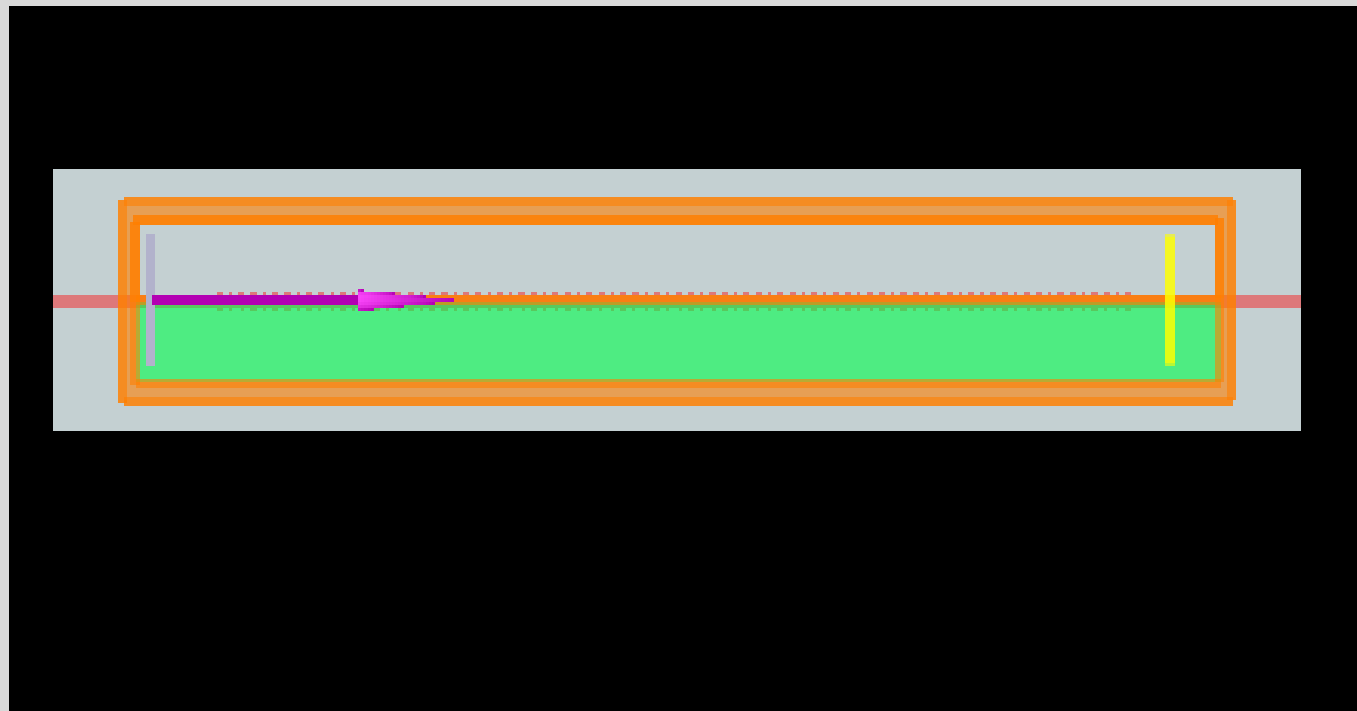
DESIGN

KLayout



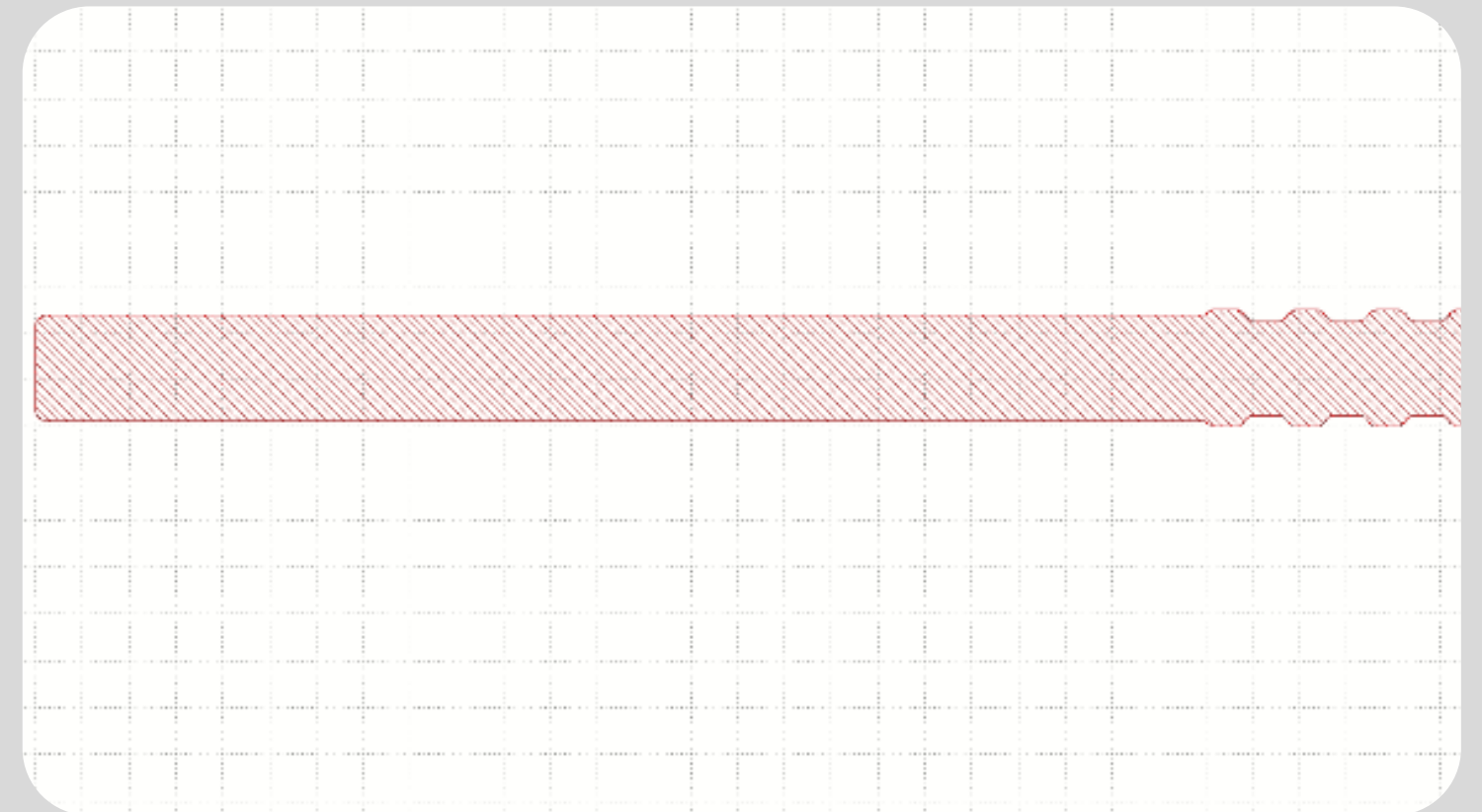
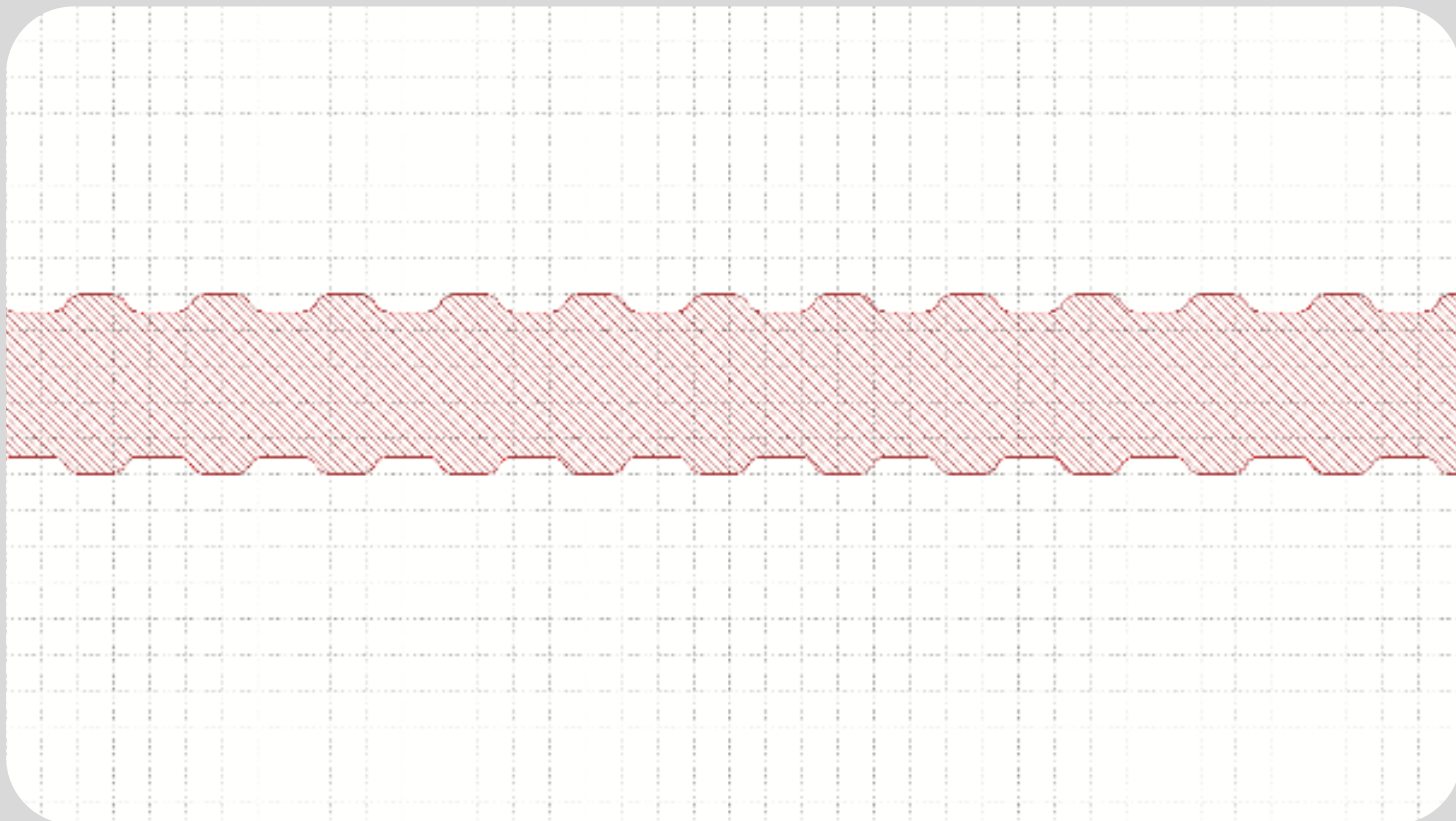
DESIGN

Lumerical FDTD Lithography

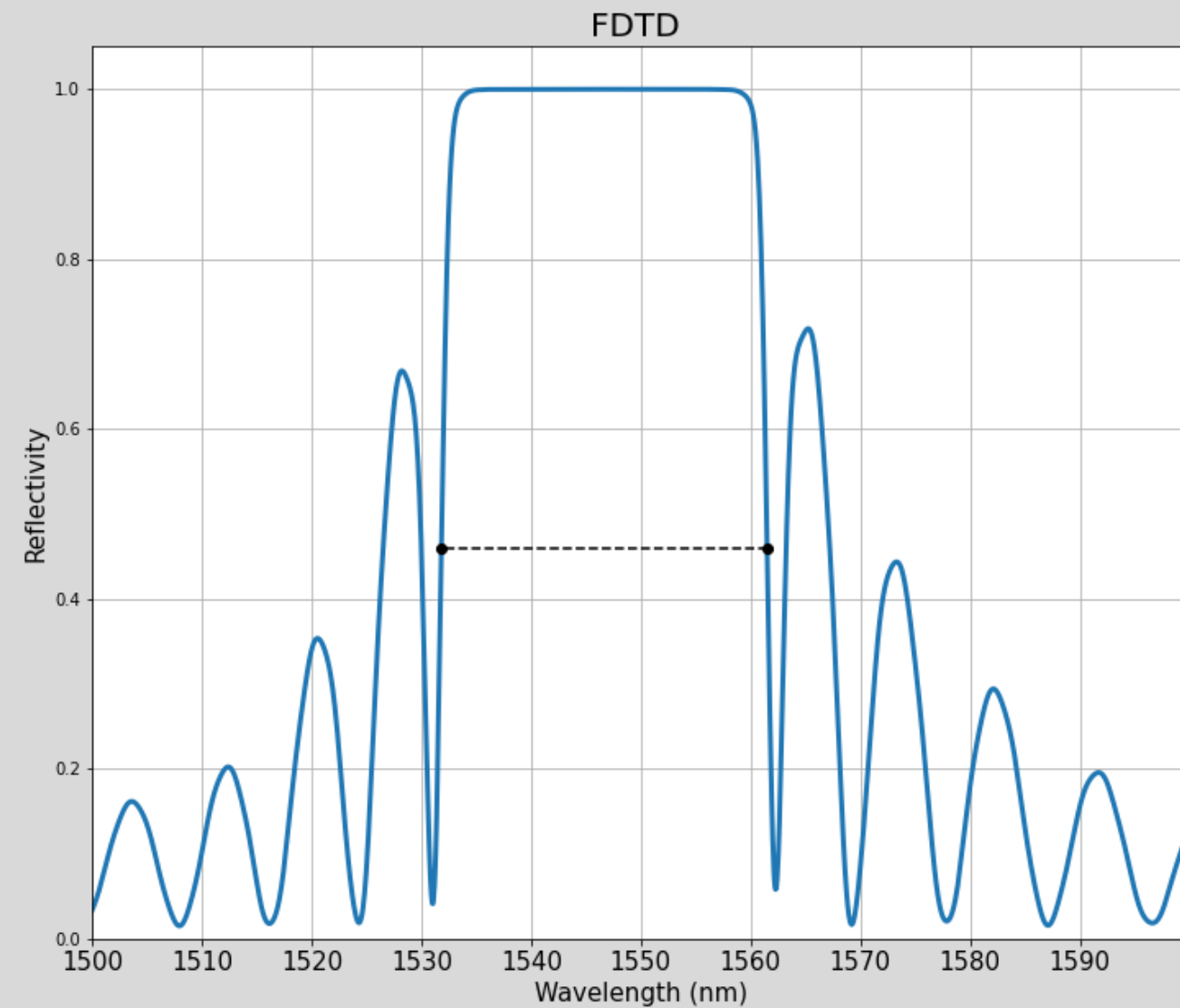


DESIGN

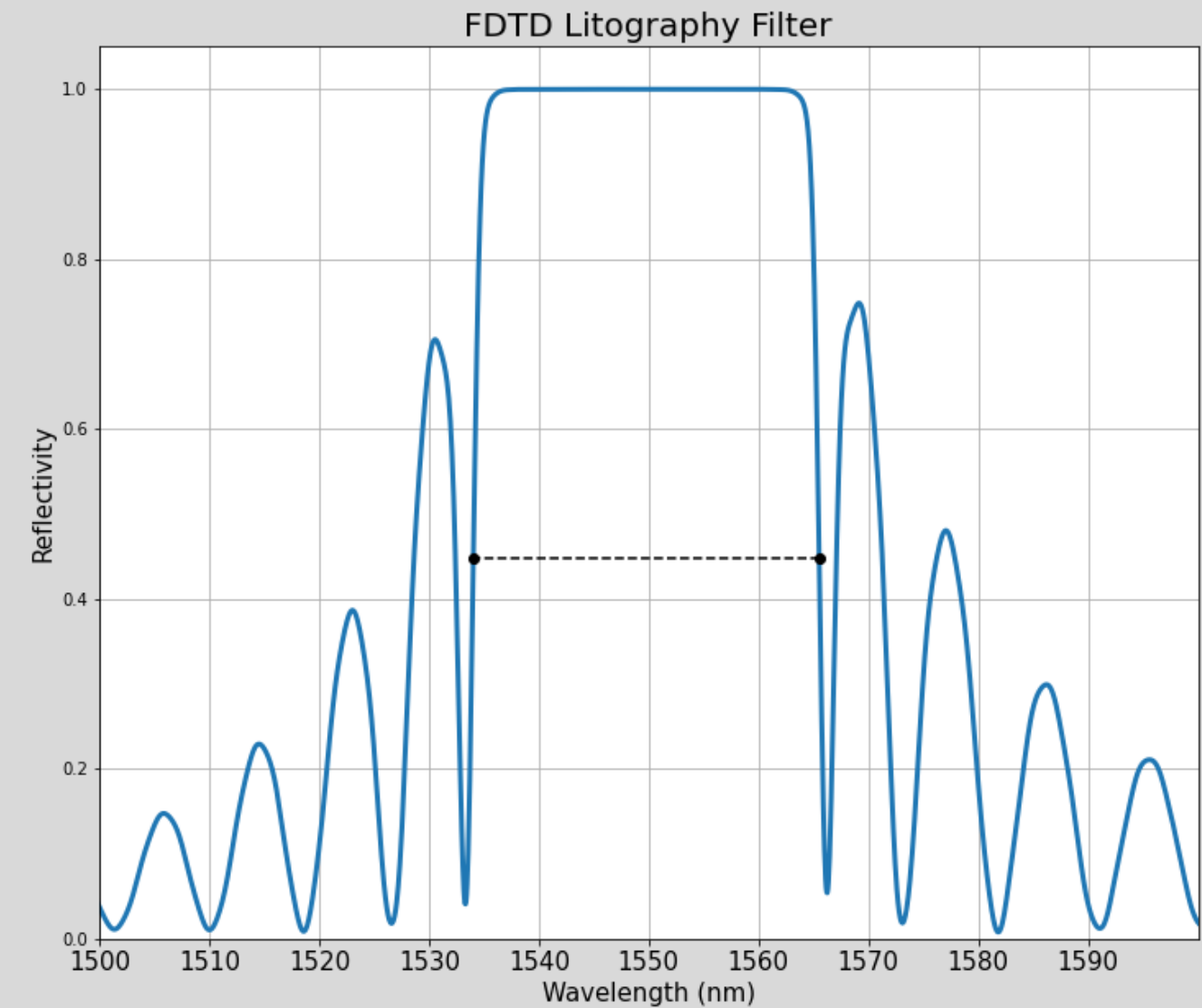
KLayout Lithography



LITHOGRAPHY VS THEORETICAL



$\lambda_B = 1547.41\text{nm}$, FWHM = 29.6658nm



$\lambda_B = 1550.48\text{nm}$, FWHM = 31.4779nm

CONCLUSION

The EME Result diverges a lot with FDTD. This occur beacause of the lower precision on the EME simulation.

As expected due to the high sensibility of the bragg grating, the litography results diverges a little from the theoretical.