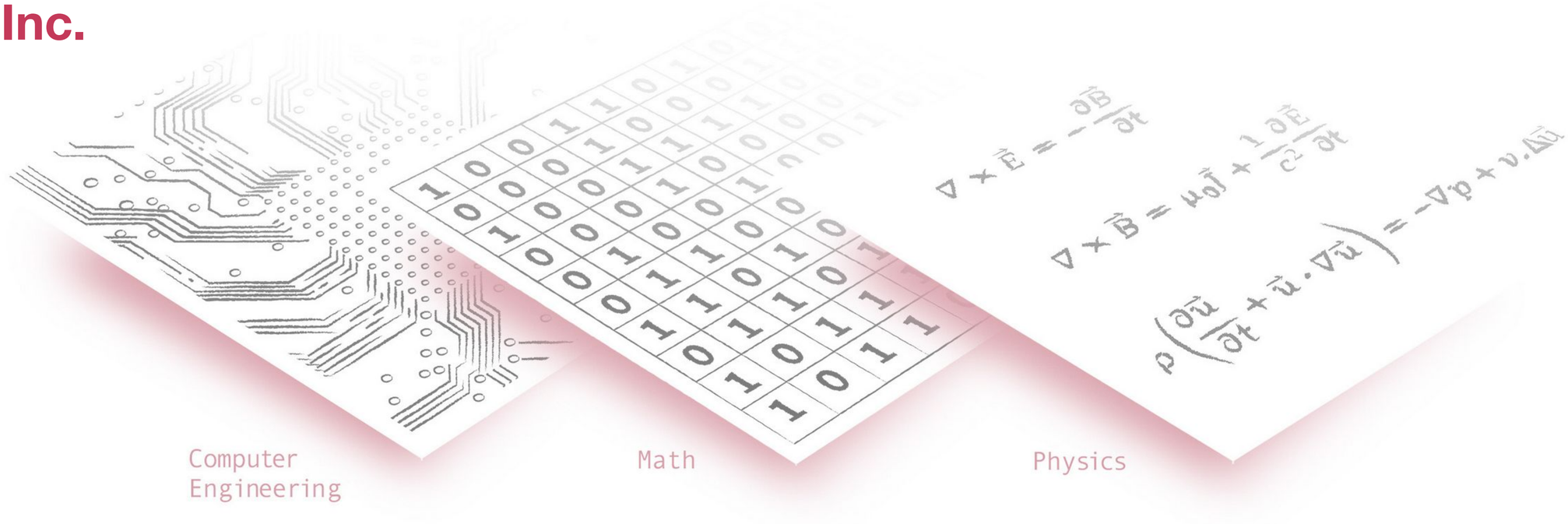
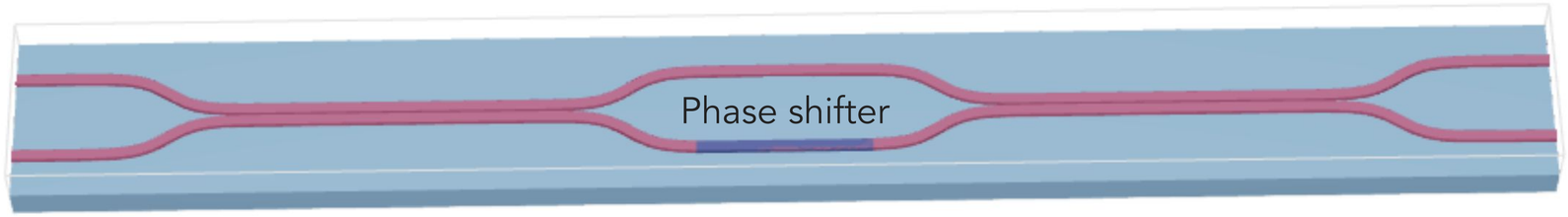
INTRO TO FDTD (4)

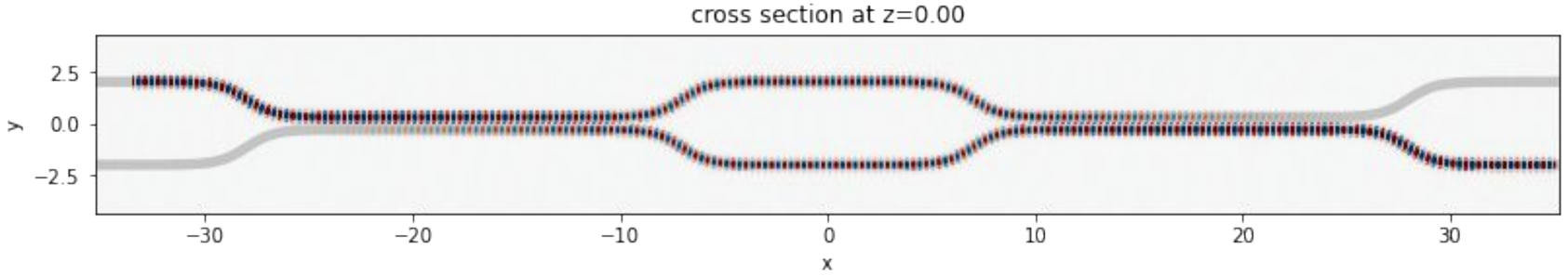
Flexcompute **Inc.**



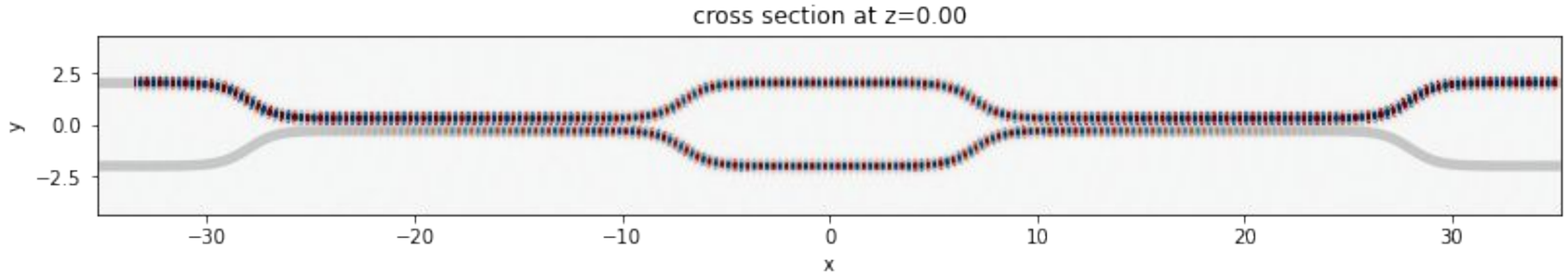
Tidy3D

Mach-Zehnder Interferometer

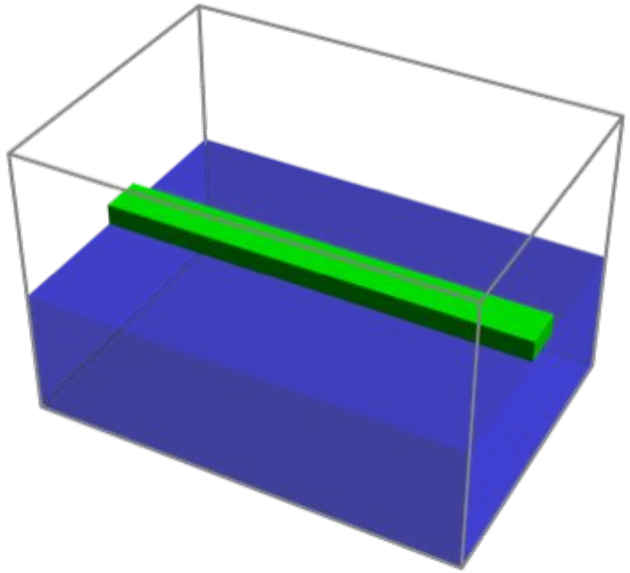


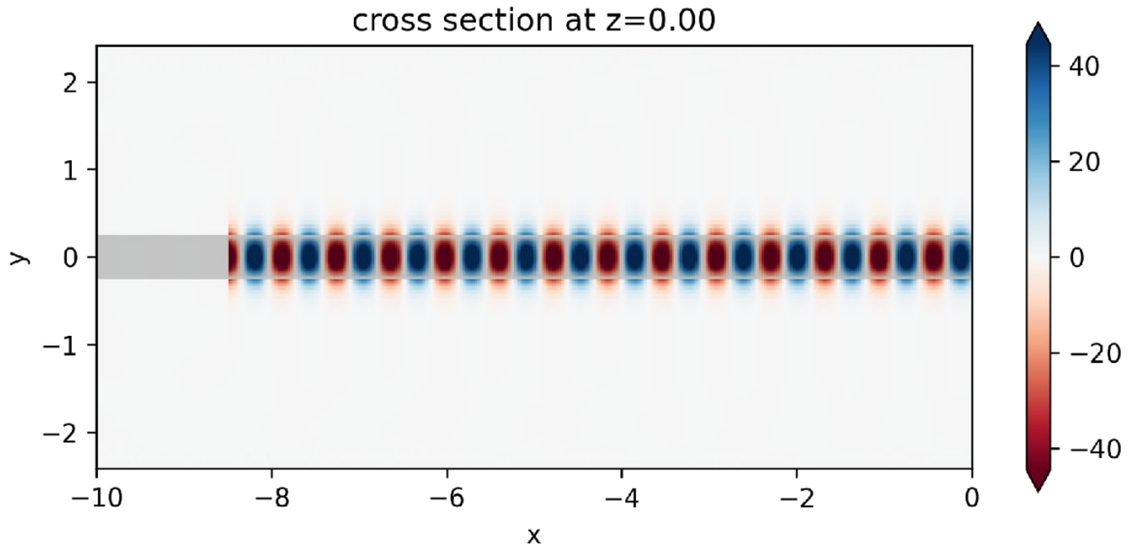


Apply π shift:



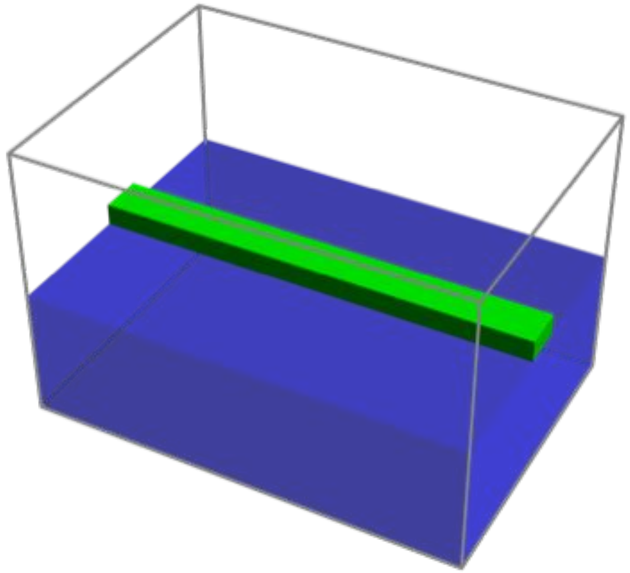
Excite a single waveguide mode



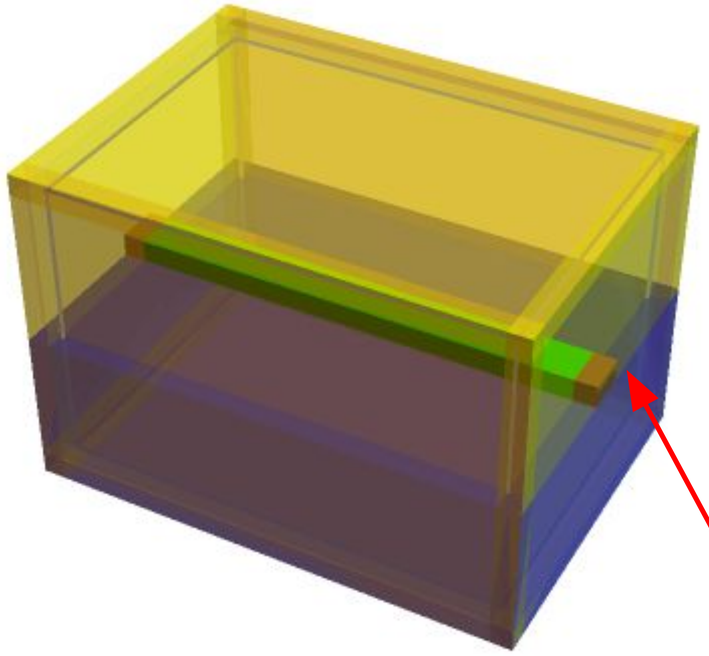


Straight silicon waveguide on silica substrate

Width: $0.5\ \mu m$
Height: $0.25\ \mu m$
Central wavelength: $1550\ \mathrm{nm}$

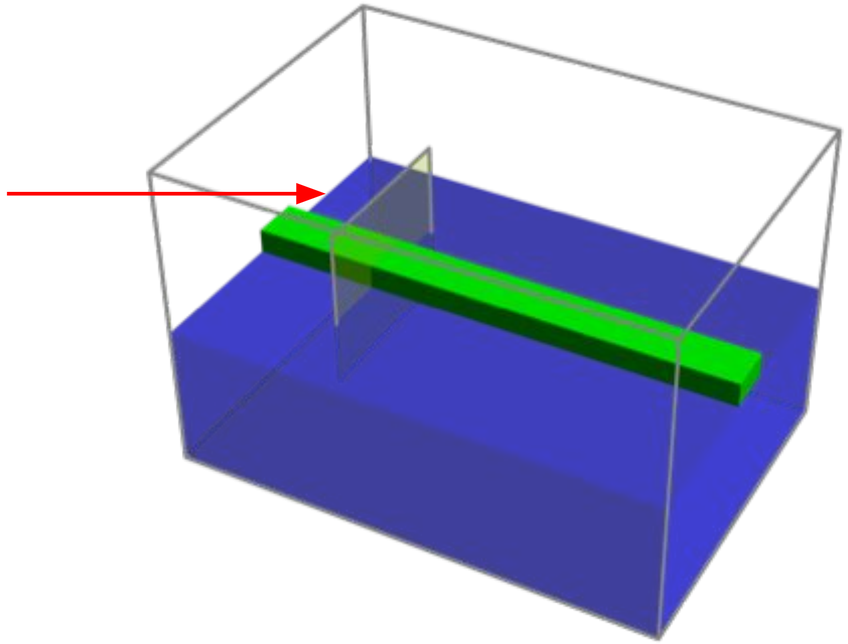


Surround the computational domain
with perfectly matched layers (PML)



Waveguide and substrate extended
into the PML region to ensure the
absorption of the waveguide mode.

Use eigenmode source defined on a plane to inject a specific mode along the forward direction.

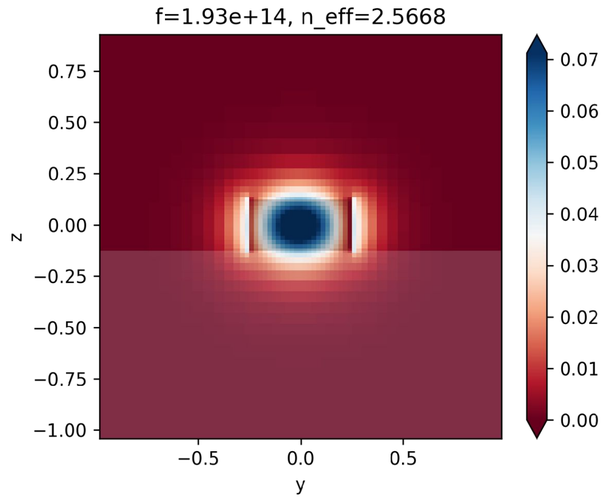


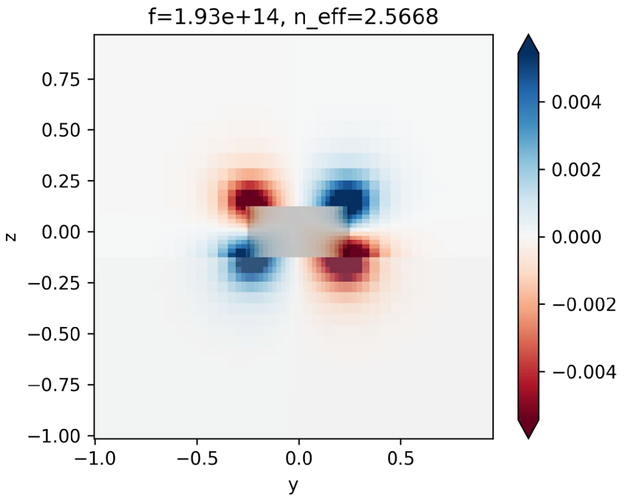
Tidy3D

- Use eigenmode solver to visualize the modes
- Select which mode to excite

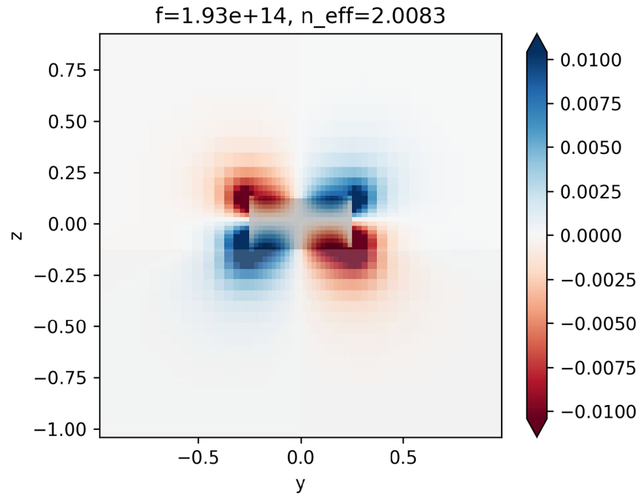
E_y E_z

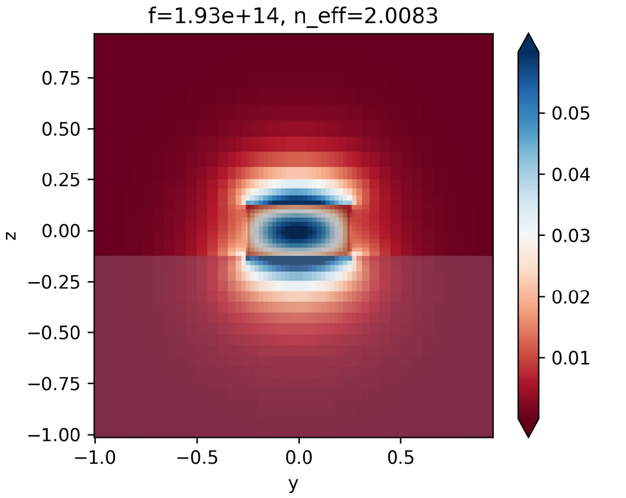
1st TE



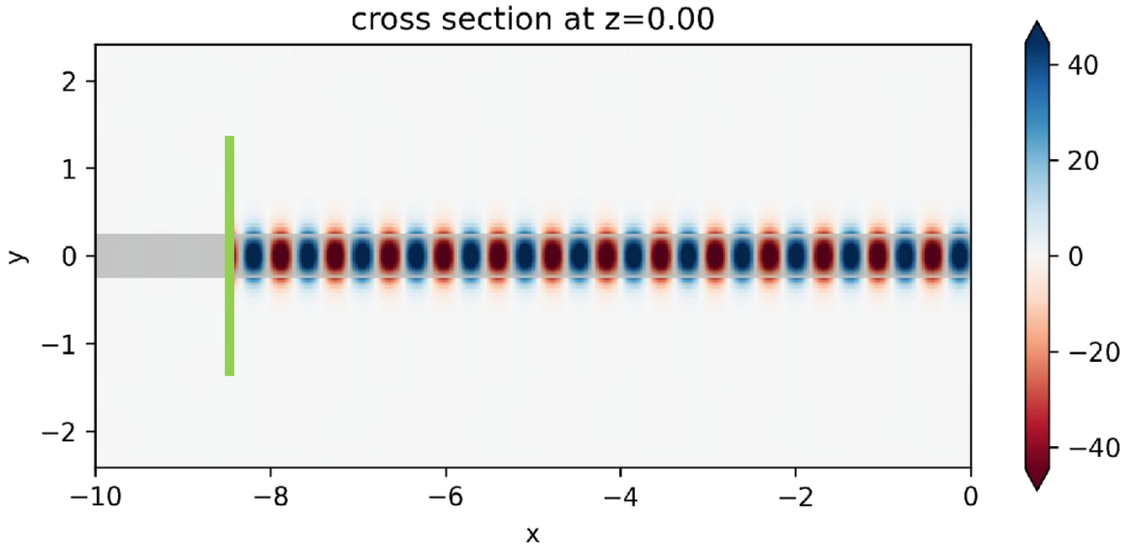


1st TM

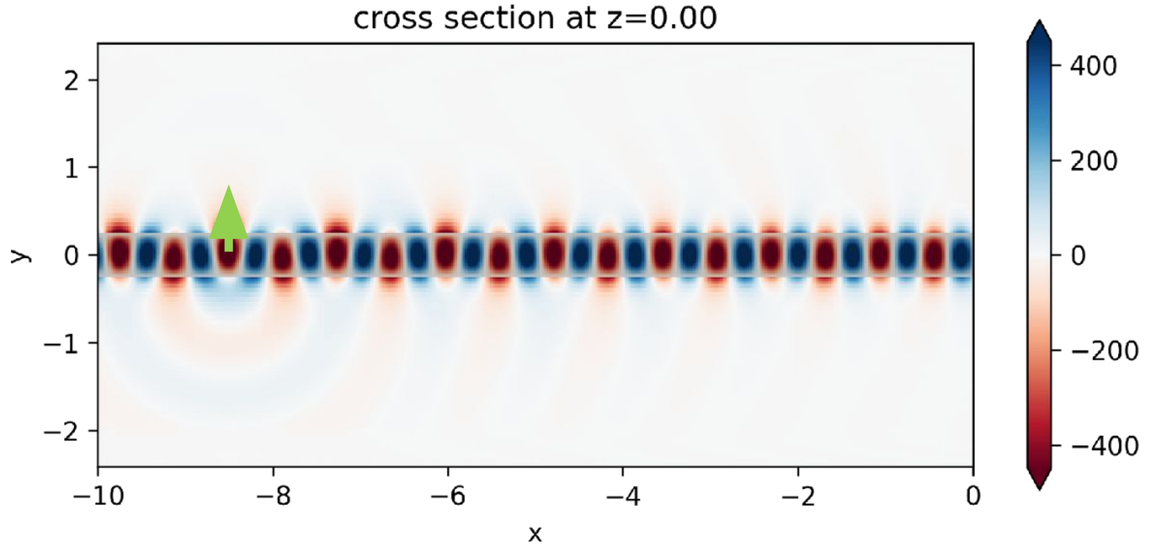


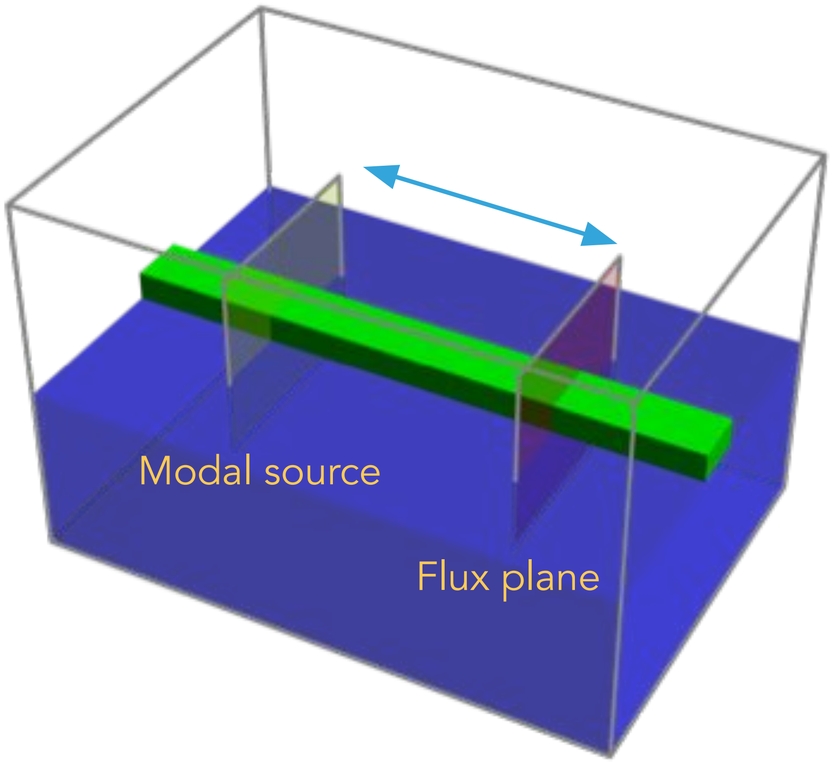


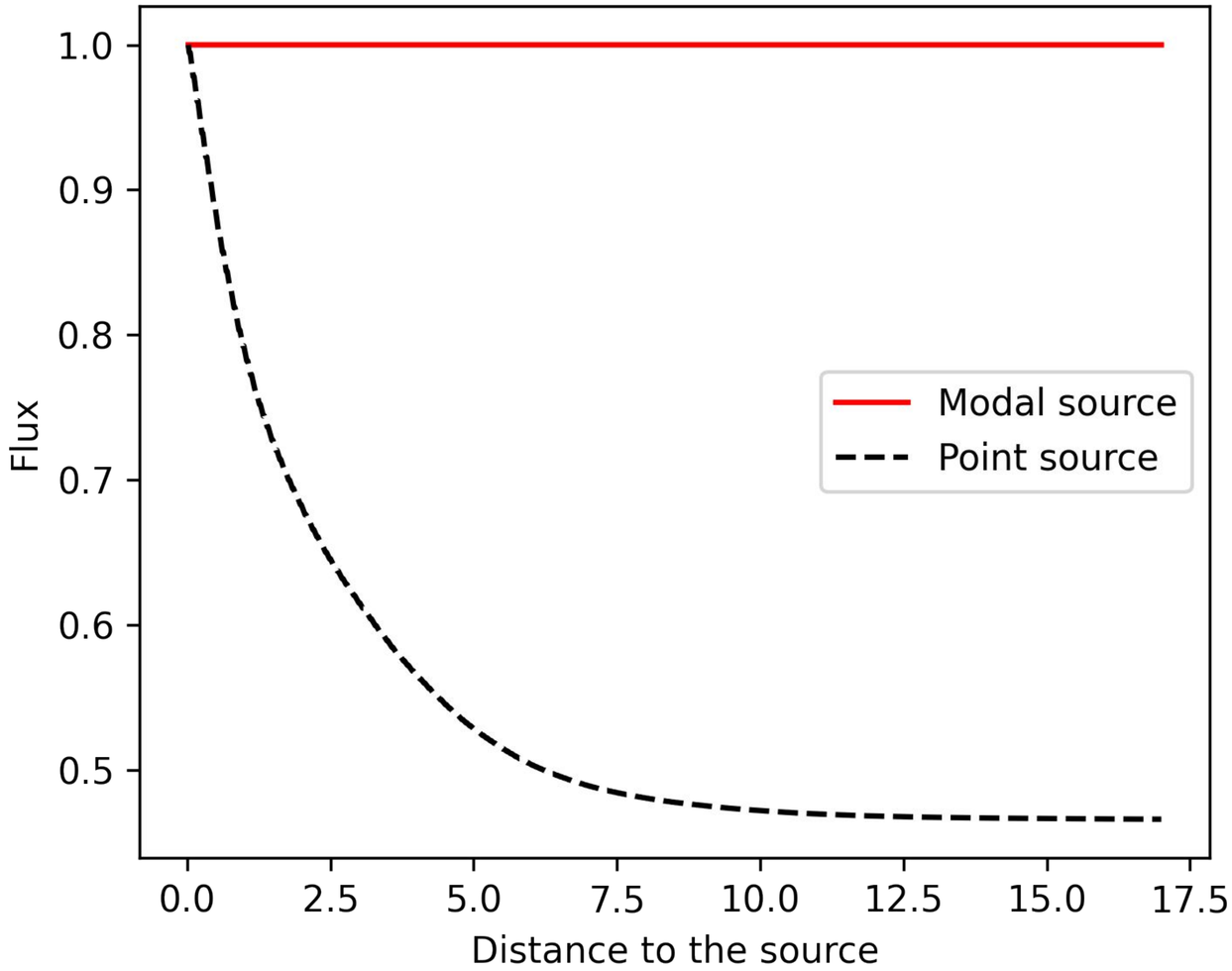
Model source to excite the 1st TE mode



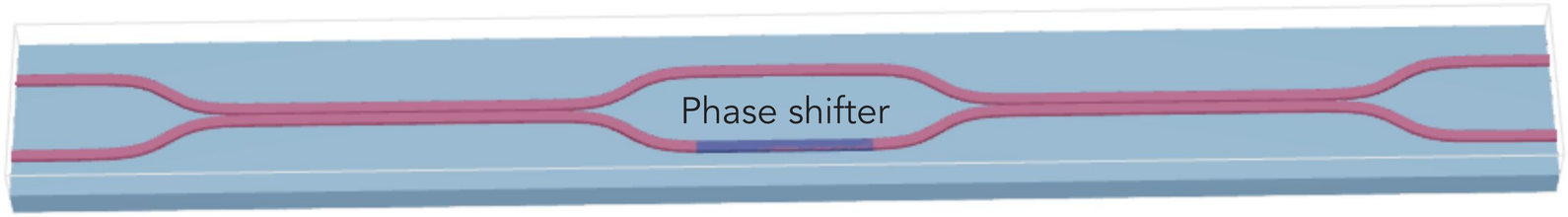
Point dipole source excitation

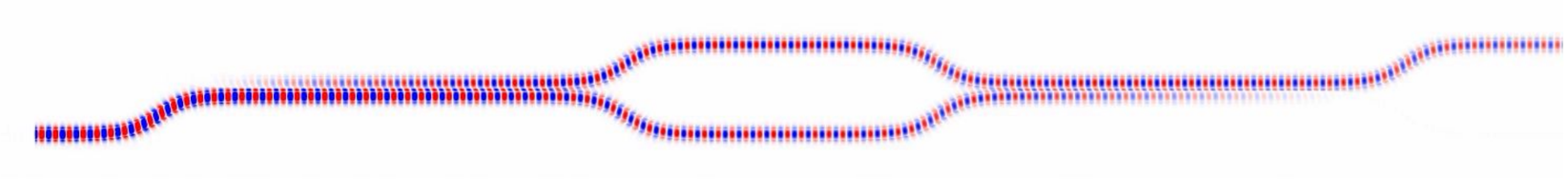



Modal source
Flux plane


1.0
0.9
0.8
0.7
0.6
0.5
Flux
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Distance to the source
Modal source
Point source

Mach-Zehnder Interferometer





Apply π shift: