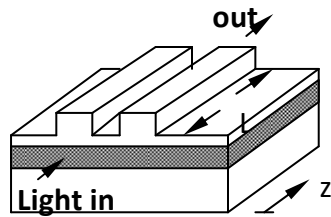


# Ultra-linear Modulator Designs

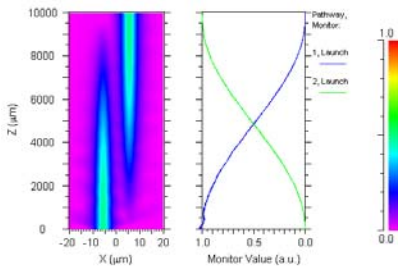
Anand Gopinath (PI), Jaesang Oh

Electrical & Computer Engineering, University of Minnesota

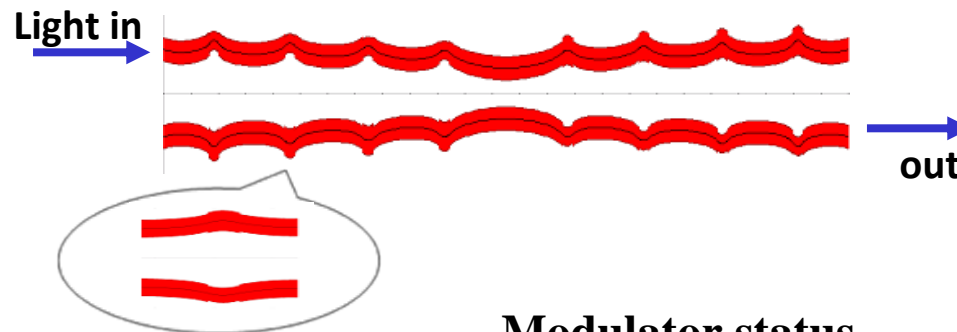
NNIN Facility utilized: Nanofabrication Center



## • Phase-shift Directional Coupler Modulator (PDCM)



## • Variable Directional Coupler Modulator (VDCM)



### Modulator status

- Frequency response over 20 GHz
- Switching voltage 6.5 V for Design I
- Switching voltage 14V for Design
- IMD3 under Noise level

### Status of Project