

3-Dimensional Photonic Crystal Waveguides

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NNIN Facility utilized: Nanofabrication Center

DESCRIPTION OF WORK

- ◆ Complete 3-D photonic bandgap (PBG)
- ◆ Embedded α -Si waveguide: line defect
- ◆ FDTD simulation: low propagation loss in PBG ($\lambda = 1520 \text{ nm} \sim 1590 \text{ nm}$)
- ◆ α -Si waveguide: anisotropic etching of Si wafer (KOH, NFC), LPCVD (tube32, NFC), RIE (STS, NFC)
- ◆ Opal (template): self-assembly of silica spheres
- ◆ Inverse opal: Infiltrated α -Si by LPCVD (tube32, NFC), etched air spheres by RIE (STS, NFC) & BOE

PROGRESSION OF WORK

- ◆ Fabrications & characterizations of waveguide embedded in inverse opal : In process
- ◆ Be to complete in June 2008

