

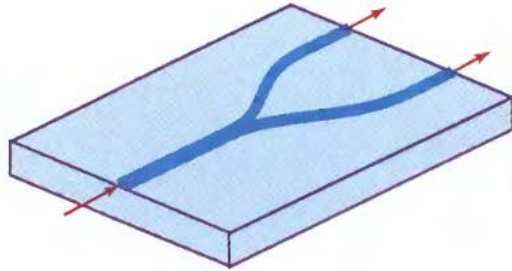
Fiber Optic Communications

Lecture 12: On-Chip Interconnects

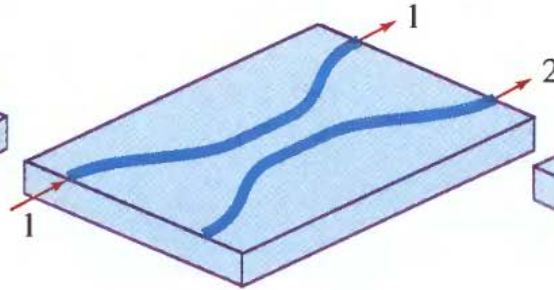
- Guided Wave Interconnects
- Photonic Crystals
- Photonic Waveguides
- Photonic Slabs

Couplers

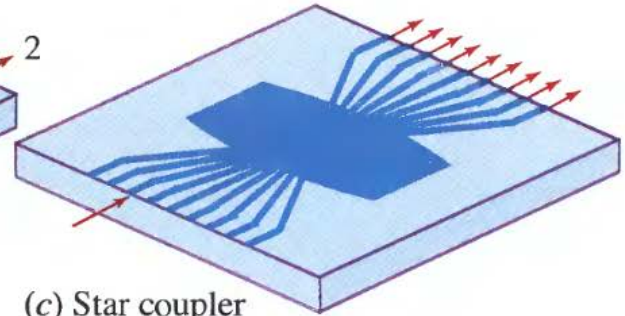
Integrated couplers



(a) T-coupler

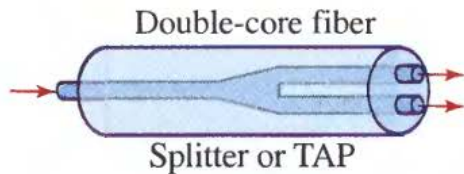


(b) 3-dB coupler

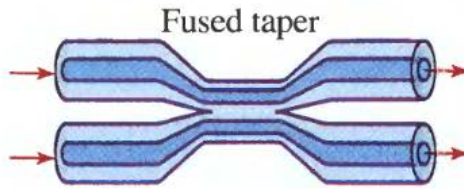
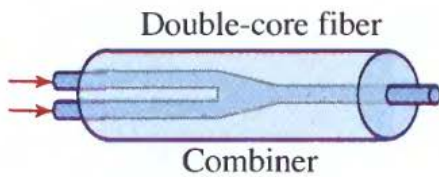


(c) Star coupler

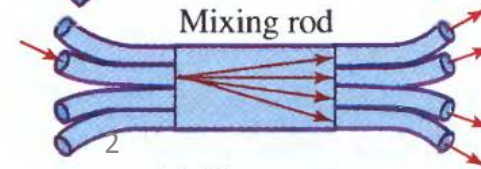
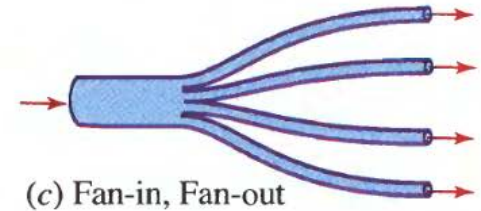
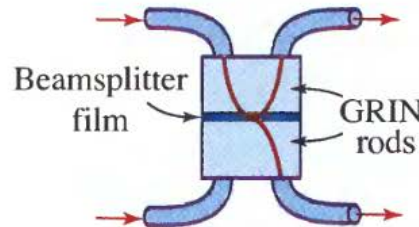
Fiber couplers



(a) T-coupler



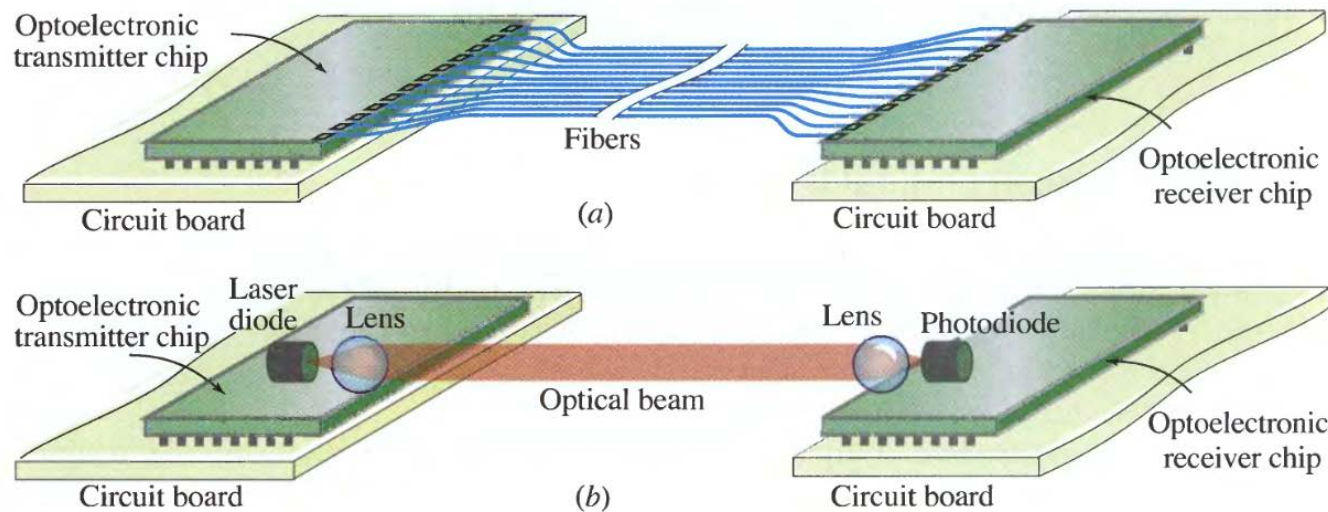
(b) 3-dB coupler



(d) Star coupler

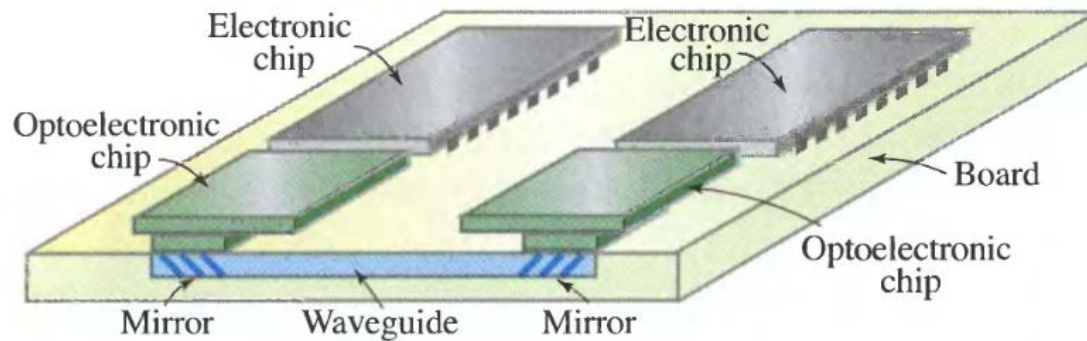
On-chip interconnects

- Advantages of on-chip optical interconnects
 - High speed
 - Low power
 - High density

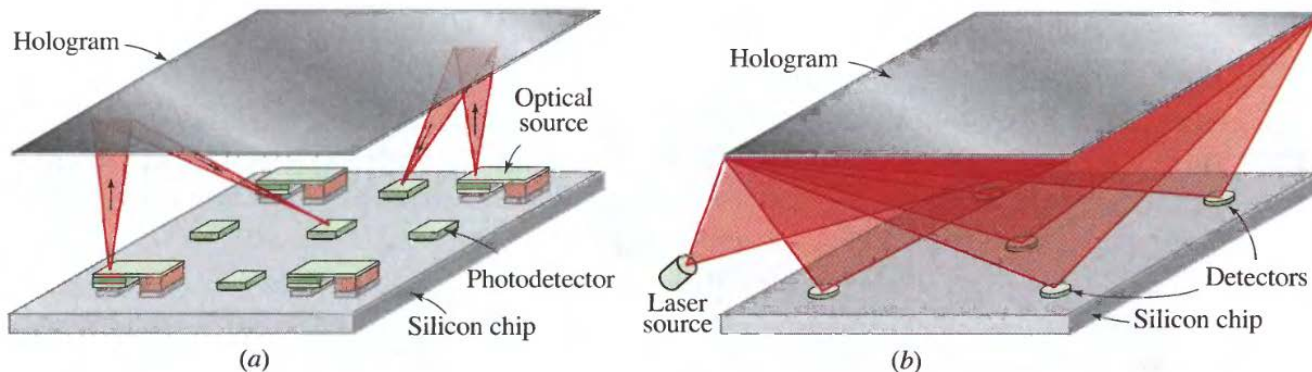


Optical interconnects

Chip-to-chip interconnects



External reflection hologram interconnects



Integration

- Hybrid integration: flip-chip bonding
 - bonding silicon CMOS chip with photonics chip

