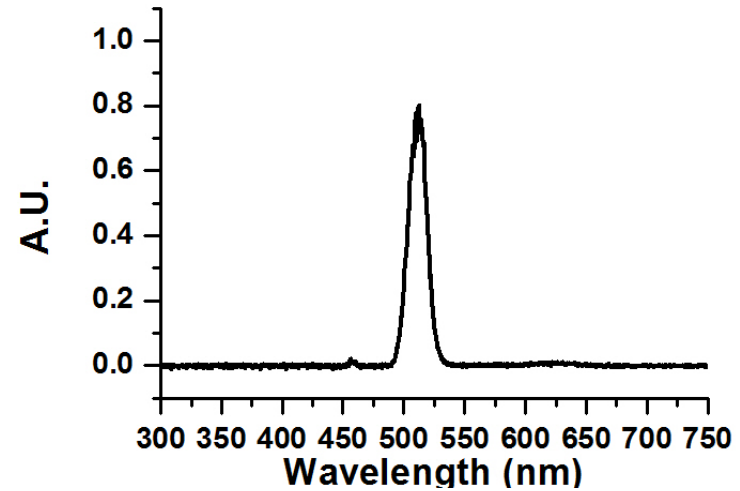
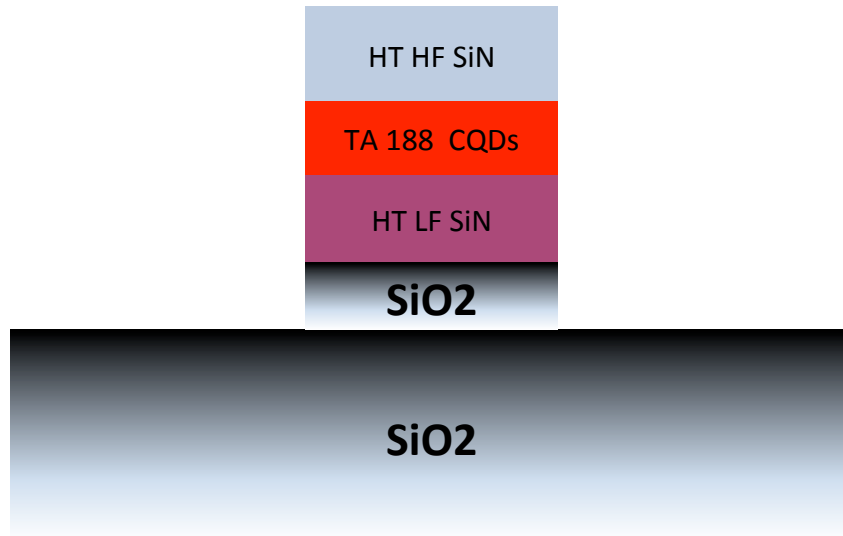
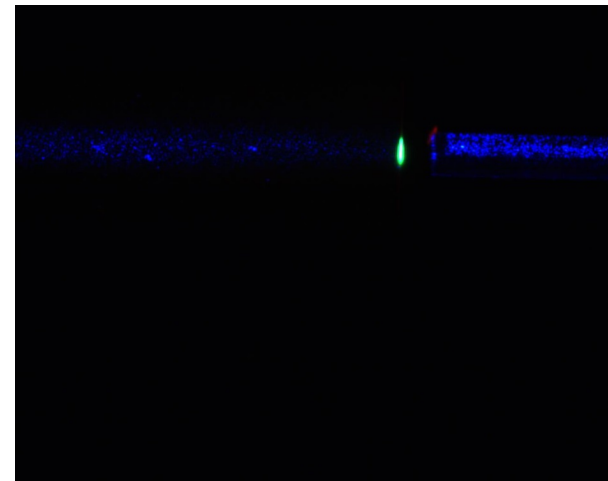


SiN with embedded QDots



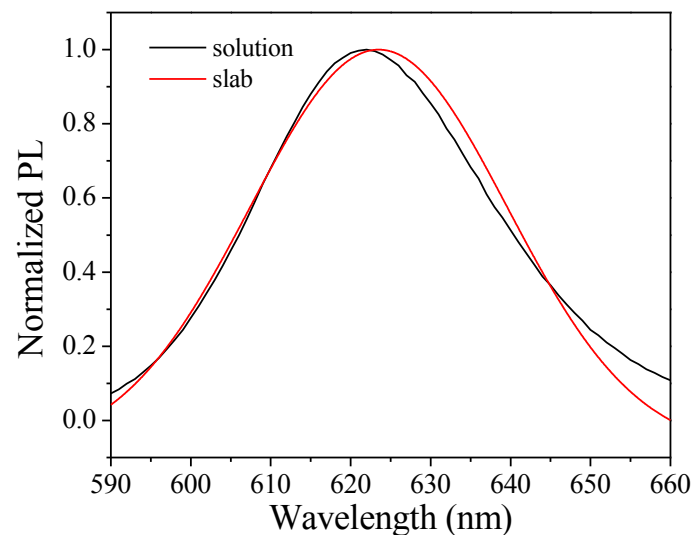
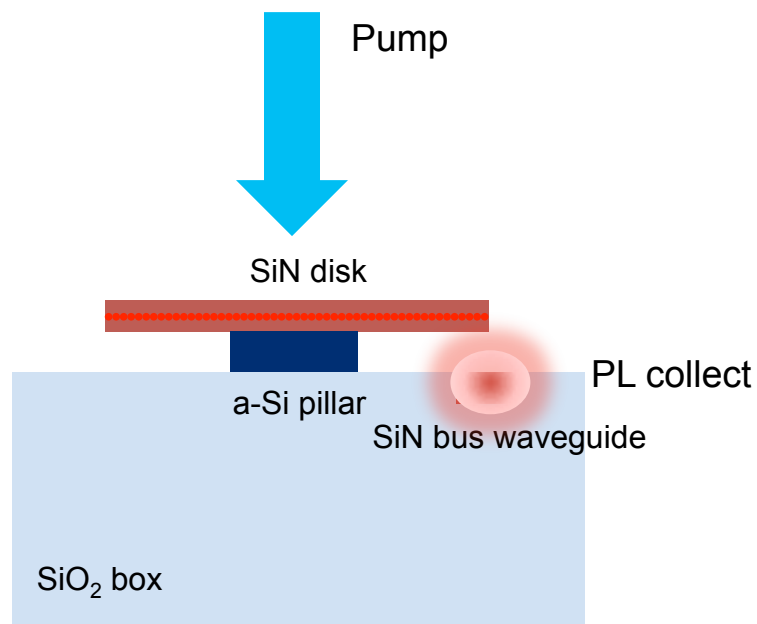
First demonstration ASE for SiN + QDOTs
(core-shell CdSe/CdS)



PL characterization

Configuration of PL measurement

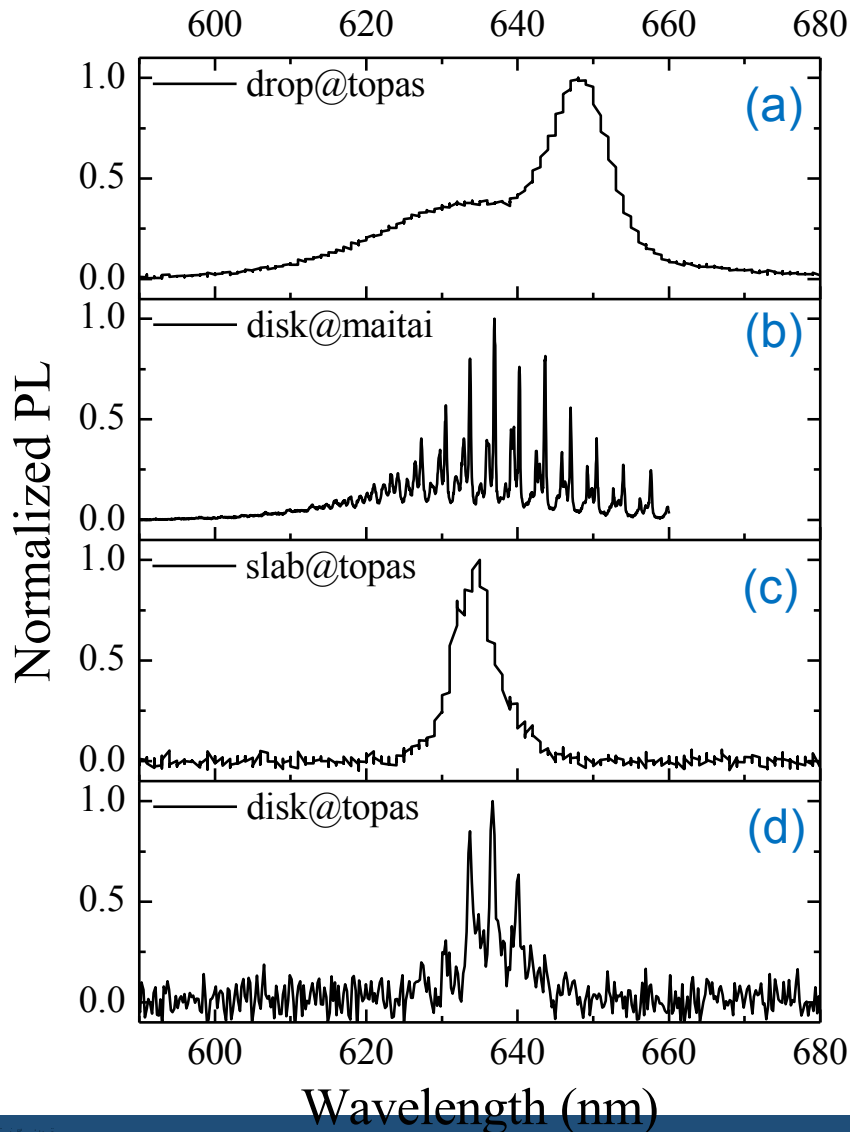
1. Pump with 400nm femtosecond laser on the top of disk (80MHz repetition rate, focused spot size $\sim 100\mu\text{m}$ diameter, $\sim 200\text{mW}$ average power)
2. Collect the PL from the cleaved facet of on-chip bus waveguide using microlensed fiber



Cross-sectional schematics of PL measurement

PL of SiN-QD disk

For disk pump on the top of disk and collect from the facet of waveguide



(a) ASE measurement on a drop cast film of QDs and pumping with a 1 kHz amplified system at 450nm (topas)

(b) PL of the disk and pumping with 80 MHz Ti:Sapphire laser at 400nm (maitai)

(c) PL of SiN/QD/SiN slab and pumping with topas at 450nm

(d) PL of the disk and pumping with topas at 450nm

QDOT-amplifier status

- Gain demonstrated in visible
- Next step: try again with HgTe QDOTS
- Electrically injected amplifier in processing

MS24 Demonstration of SPP amplifiers with electrical injection exhibiting 10dB/cm gain

Grating couplers

- D5.7 Second generation beam shapers (distance 1mm, with bandwidth $> 10\text{nm}$ and efficiency $> 3\text{dB}$)
- MS35 Fabrication of compact optical filters and first generation beam shapers
 - ➔ Samples delivered but still need to be measured (man power issue)