Tunable RCED

MEMS micromirror

d = 300 nm

Si-membrane with gold coating

transparent contact and AR layer

$\lambda/4$ layer EuTe

$R_1 \sim 57\%$

$pn^+\text{-photodiode}$

$\text{buffer } Pb_{0.96} Sr_{0.04} Te$

$n^+\text{-Pb}_{0.96} Sr_{0.04} Te:Bi$

$p\text{-Pb}_{0.97} Sr_{0.03} Te$

AR layer $Pb_{0.91} Eu_{0.09} Te$

electrodes
Tunable RCED with MEMS micromirror

- FWHM ~ 150 nm
- $R_1 \sim 57\%$

120 K, BG subtracted

cavity length $d_0$
@ 5 V actuation

$d_0 + 35\text{ nm} @ 21\text{ V}$

$d_0 + 75\text{ nm} @ 33\text{ V}$
Tunable RCED

Realized tunable RCED with MEMS micromirror

- Mirror movement away from the diode chip: $d \sim U^2$
- $\Delta d \sim 3.5 \, \mu m$
- Cavity length:
  - original 13 $\mu m$
  - external 7.5 $\mu m$
- Partly single mode, next higher mode orders ($n = 7, 8, 9$)
- 3.5 $\mu m$ - 4 $\mu m$