Wideband mid-IR Bragg mirrors

λ/4 layers with alternating high (H) and low (L) index

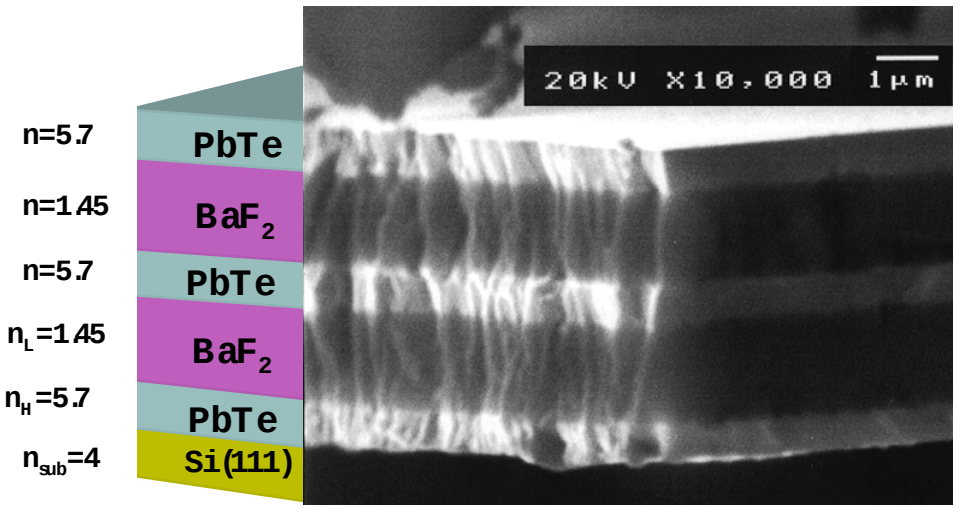
high index contrast: very high reflectivity with only few H/L pairs

Design wavelength 11 μm:

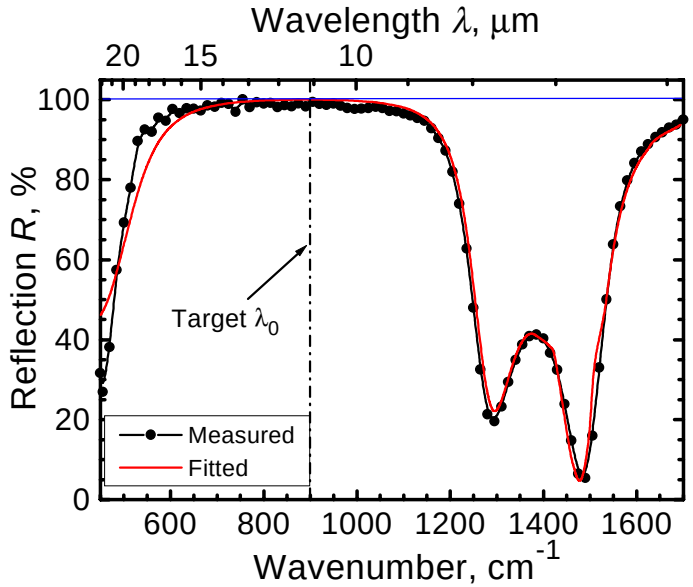
(H) PbTe n = 5.7

(L) BaF_2 n = 1.45

5 layers (2 1/2 pairs) → $R_{(calc)}$ 99.8%



SEM image and schematic drawing of the mirror profile with five layers PbTe/BaF_2 designed for the wavelength λ_0=11 μm.

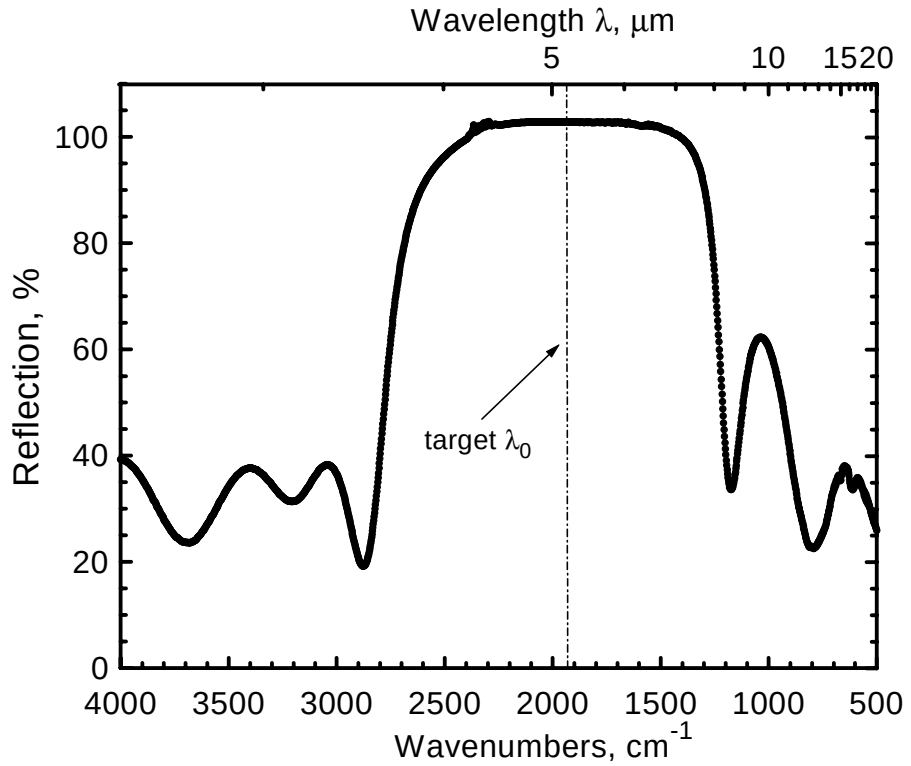


Room temperature reflection spectrum of a 2.5-pair Bragg mirror designed for λ_0=11 μm, measured and fitted curves

Design wavelength 5.2 μm:

(H) PbSe n = 5

(L) BaF_2 n = 1.45 7 layers (3 1/2 pairs) → $R_{(calc)}$ 99.96%



Room temperature reflection spectrum of a 3.5-pair Bragg mirror designed for λ_0=5.2 μm, measured