

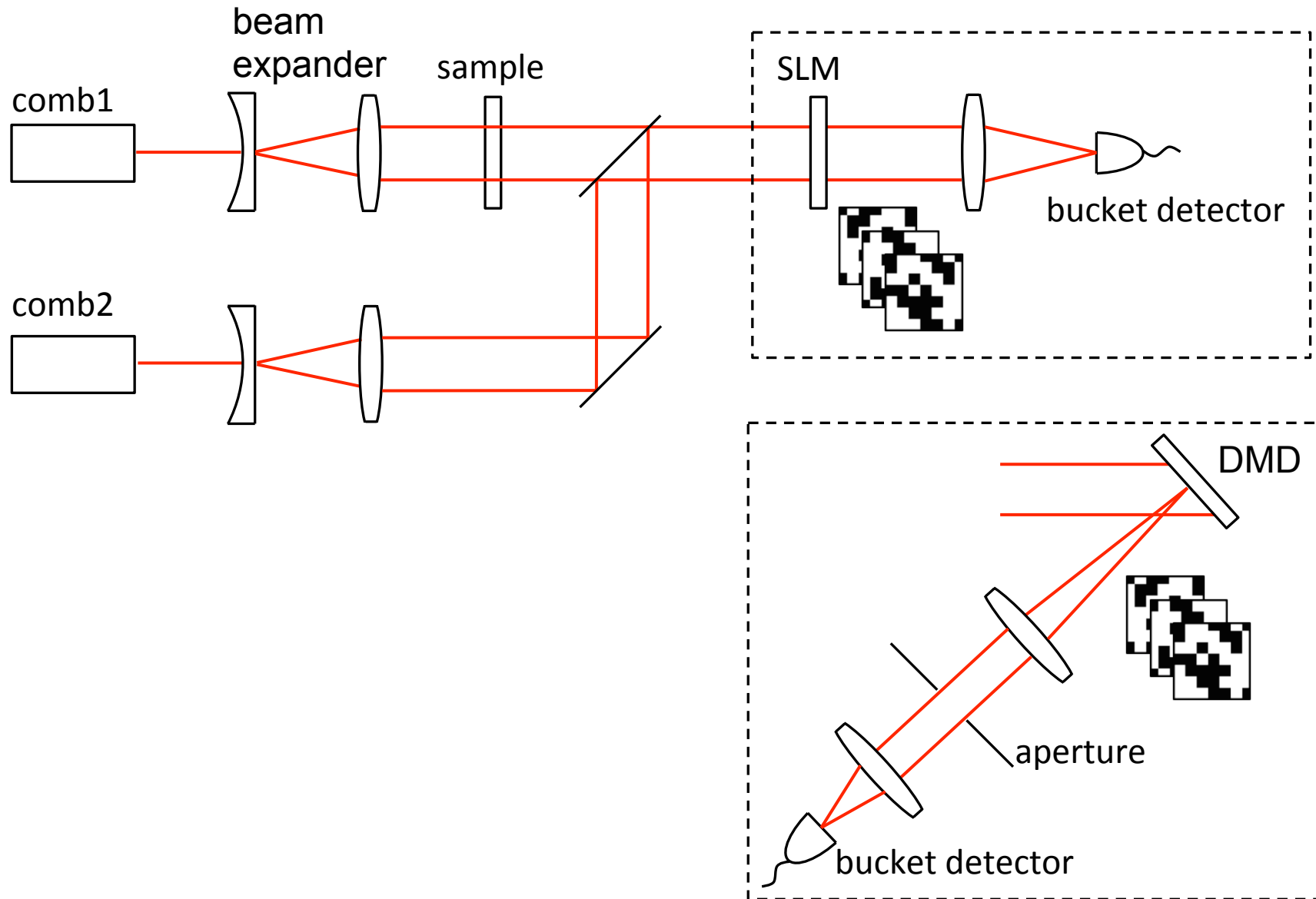
デュアル光コム分光single-pixel imaging

現状報告

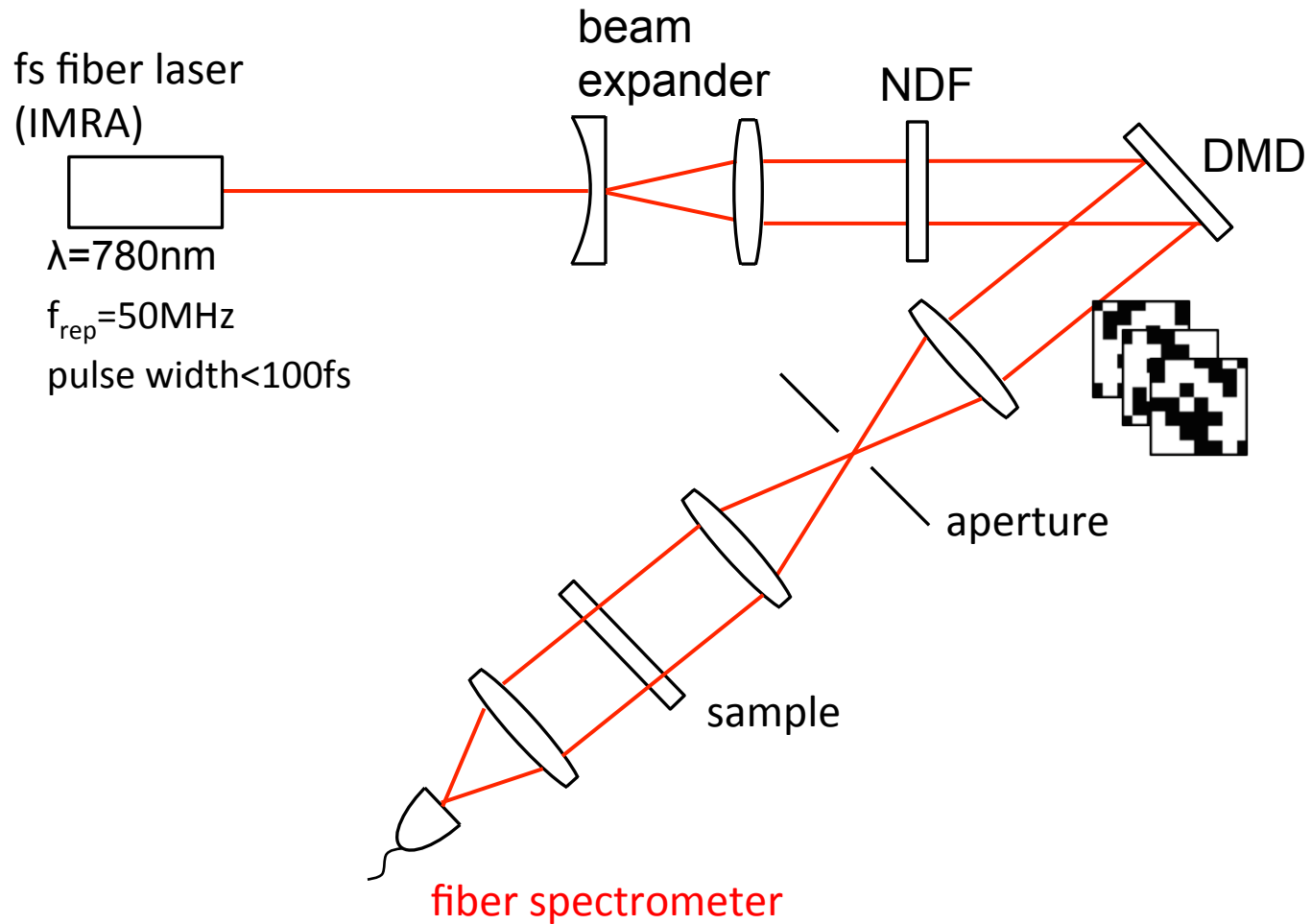
光応用計測研究室

渋谷 九輝

デュアル光コム分光single-pixel imaging

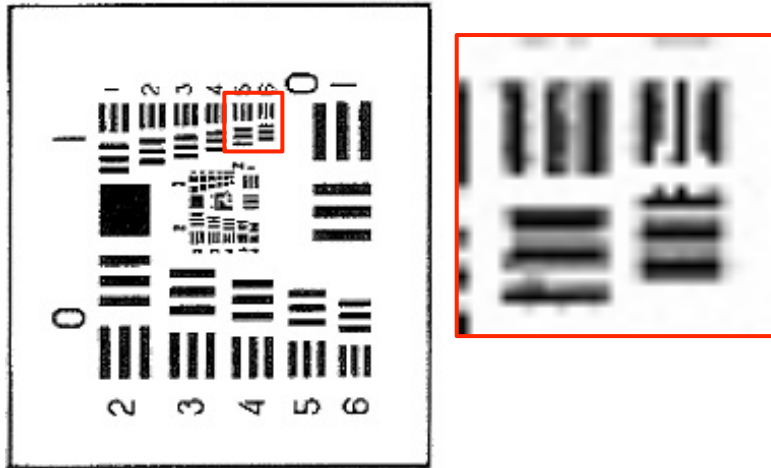


分光single-pixel imaging

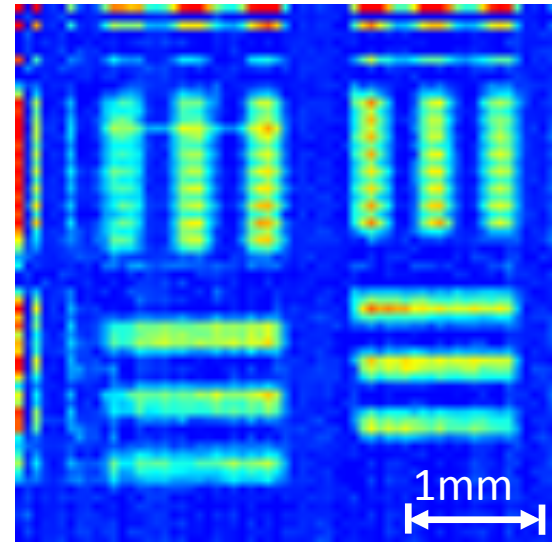


分光single-pixel imaging

sample



reconstructed image

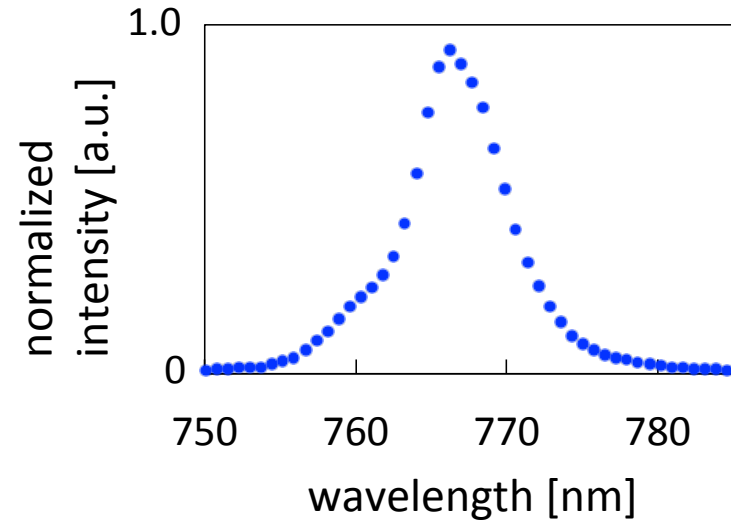
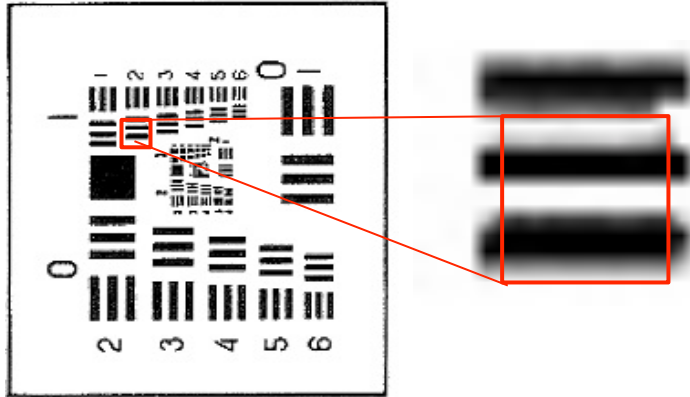


experimental condition

pattern resolution [pixels]	64x64
accumulated number	4096

分光single-pixel imaging

sample

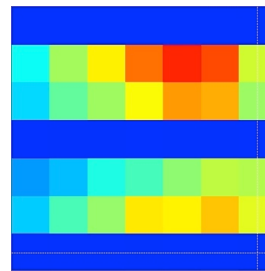


experimental condition

pattern resolution [pixels]	8x8
accumulated number	64

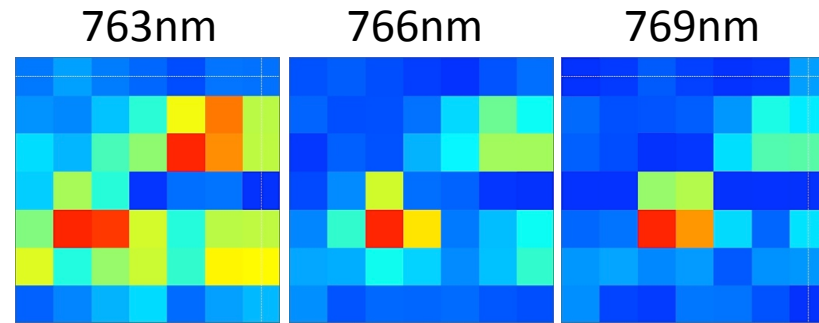
reconstructed image

Si PIN
photo diode



1mm
↔

fiber spectrometer



先行研究

Coherent Raman dual-comb spectroscopy and imaging

Ideguchi, T., Holzner, S., Bernhardt, B., Guelachvili, G., Hänsch, T. W., & Picqué, N, SPIE/COS Photonics Asia (2014).

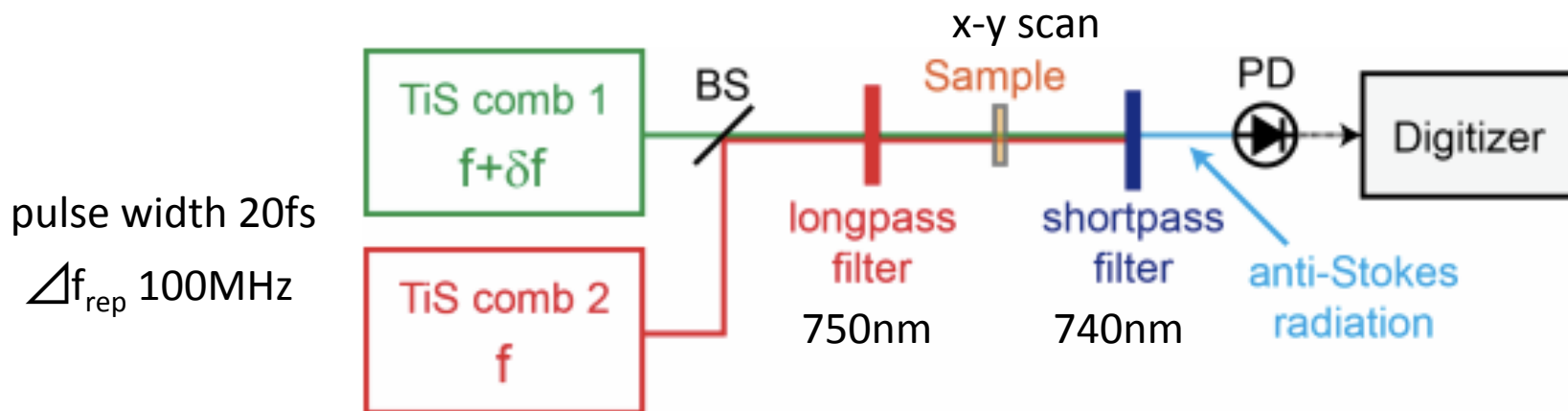
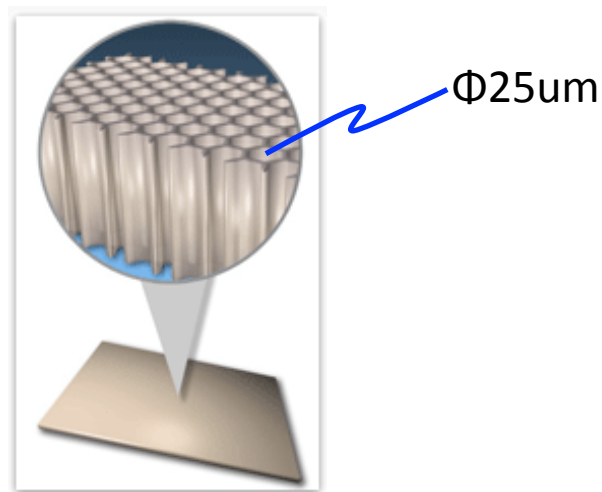


Figure 2. Experimental setup of coherent anti-Stokes Raman spectroscopy with dual frequency combs. BS: Beamsplitter, PD: Photodetector.

sample

Hexafluorobenzene,
Nitromethane,
Toluene 混合溶液

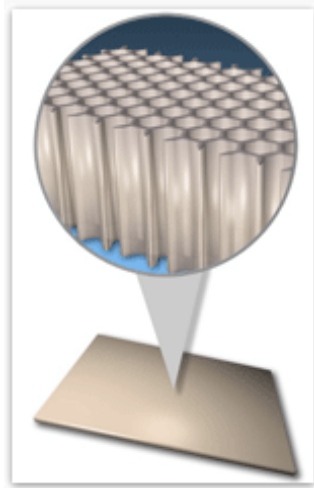


先行研究

experimental condition

pattern resolution [pixels]	45x45
measurement time [s]	40.5
spectral resolution [cm ⁻¹]	10
spatial resolution [μm]	1.9

sample



hyperspectral images

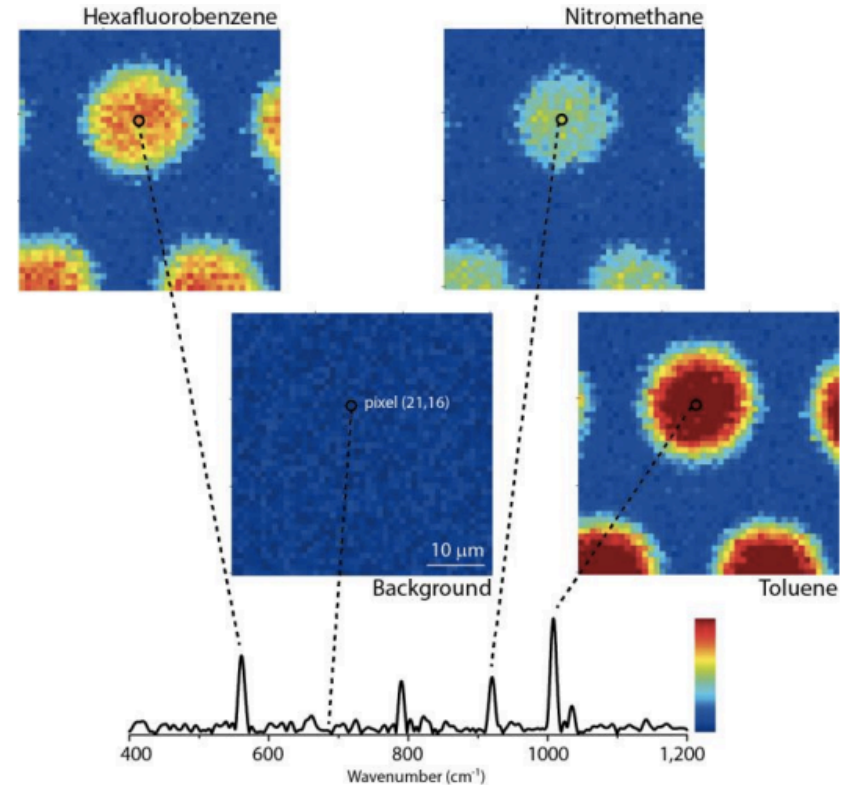


Figure 4. A hyper-spectral image of microcapillary plate with holes of 25 μm diameter filled with mixture.

DMD検討

型番	解像度 [pixels]	ミラーピッチ	DMDサイズ[mm]	ストレージパターンモード (トリガー制御)		価格
				最大投影速度[Hz]	ストレージ 可能枚数	
Lightcrafter	854 × 480	7.6μm	6.5 × 3.7	4,000	96	\$599
Lightcrafter4500	912 × 1140		9.8 × 6.1	4,225	64	\$1,299
Discovery 4100	1024 x 768	13.6um	14 × 10	22,727	43,690	\$6,500~?
V-Module (discovery4100ベース)						€ 4,990
近赤外用DMD素子						
DLP4500NIR	912 × 1140	7.6μm	9.8 × 6.1	-	-	\$758

DMD検討

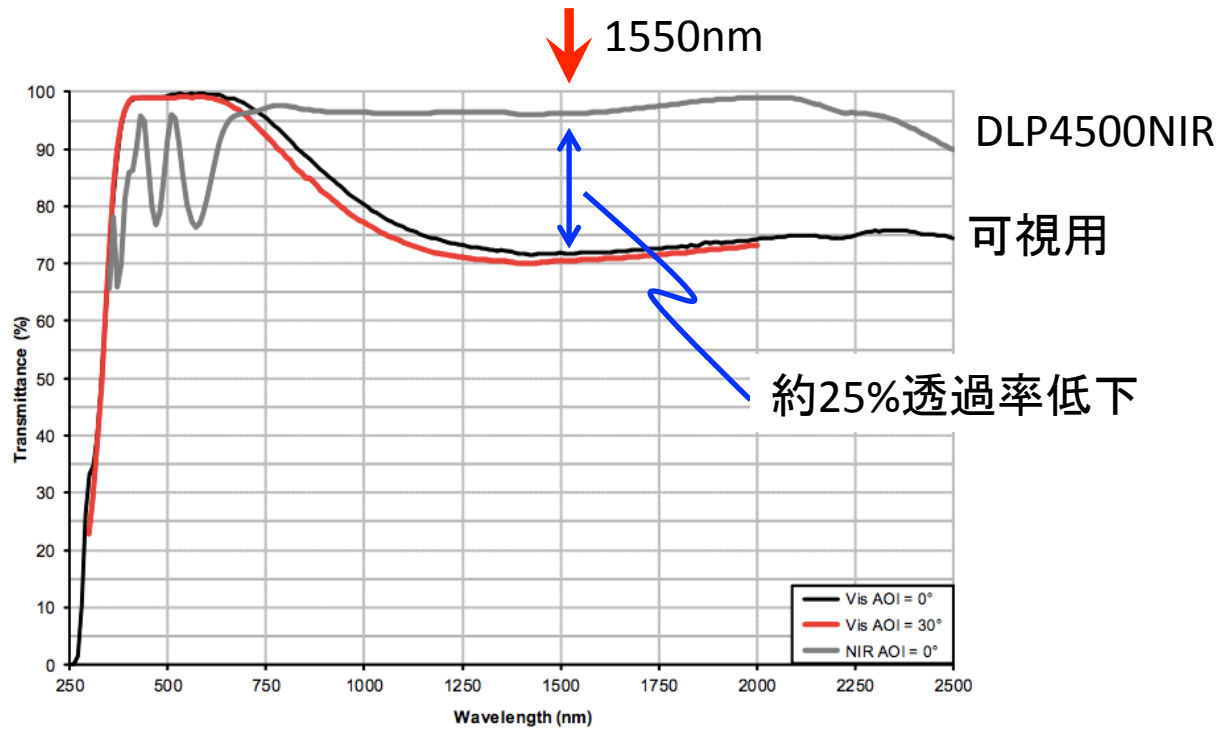


Figure 4. Corning Eagle XG Window AR Coating Options