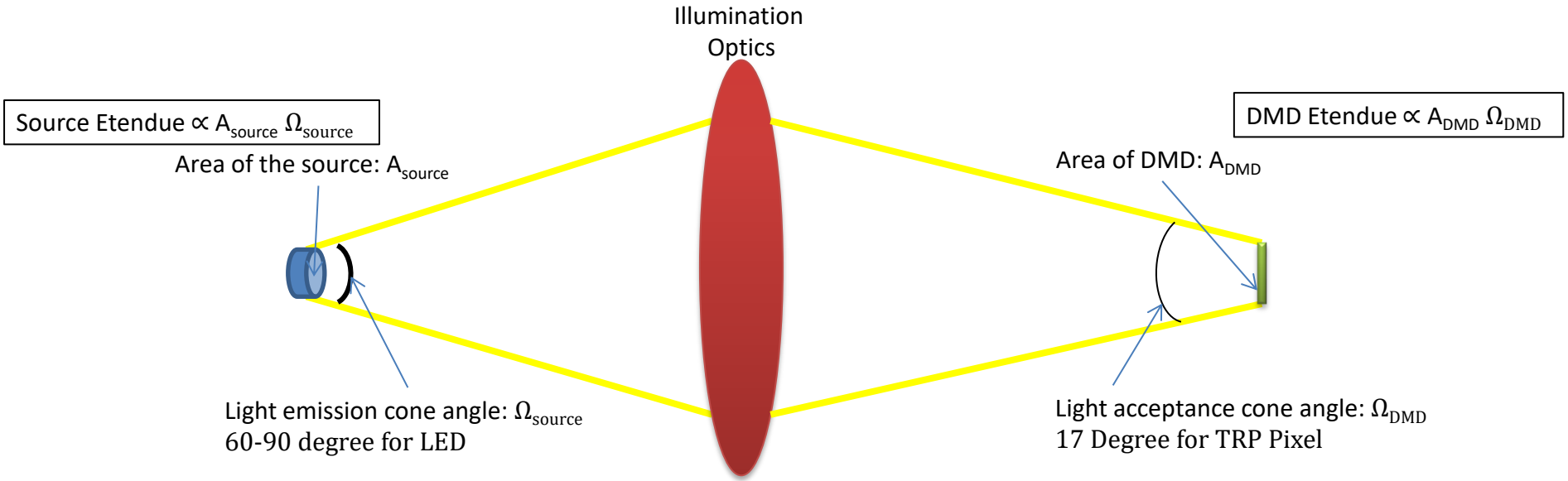
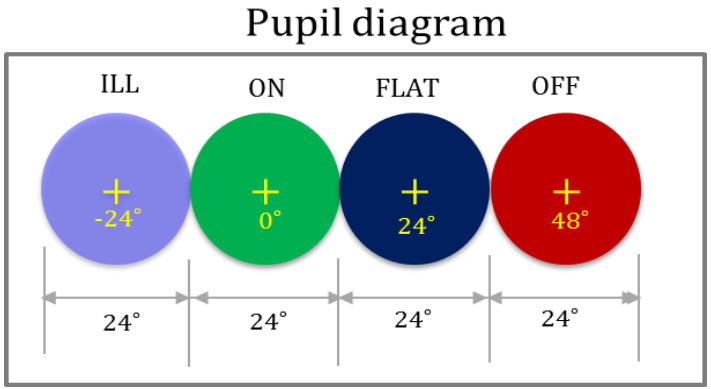
DMD etendue



For efficient light collection : DMD Etendue ≥ Source Etendue

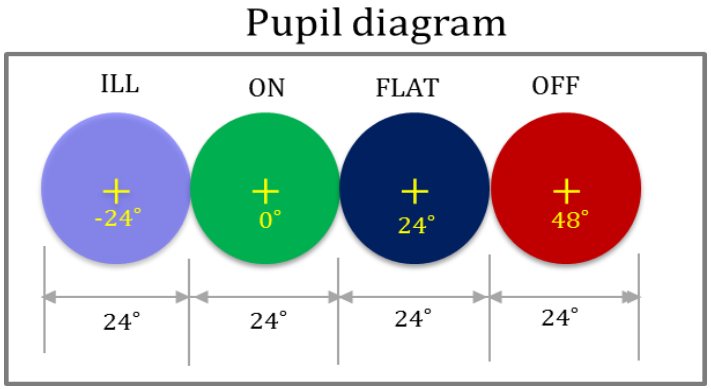
DMD etendue

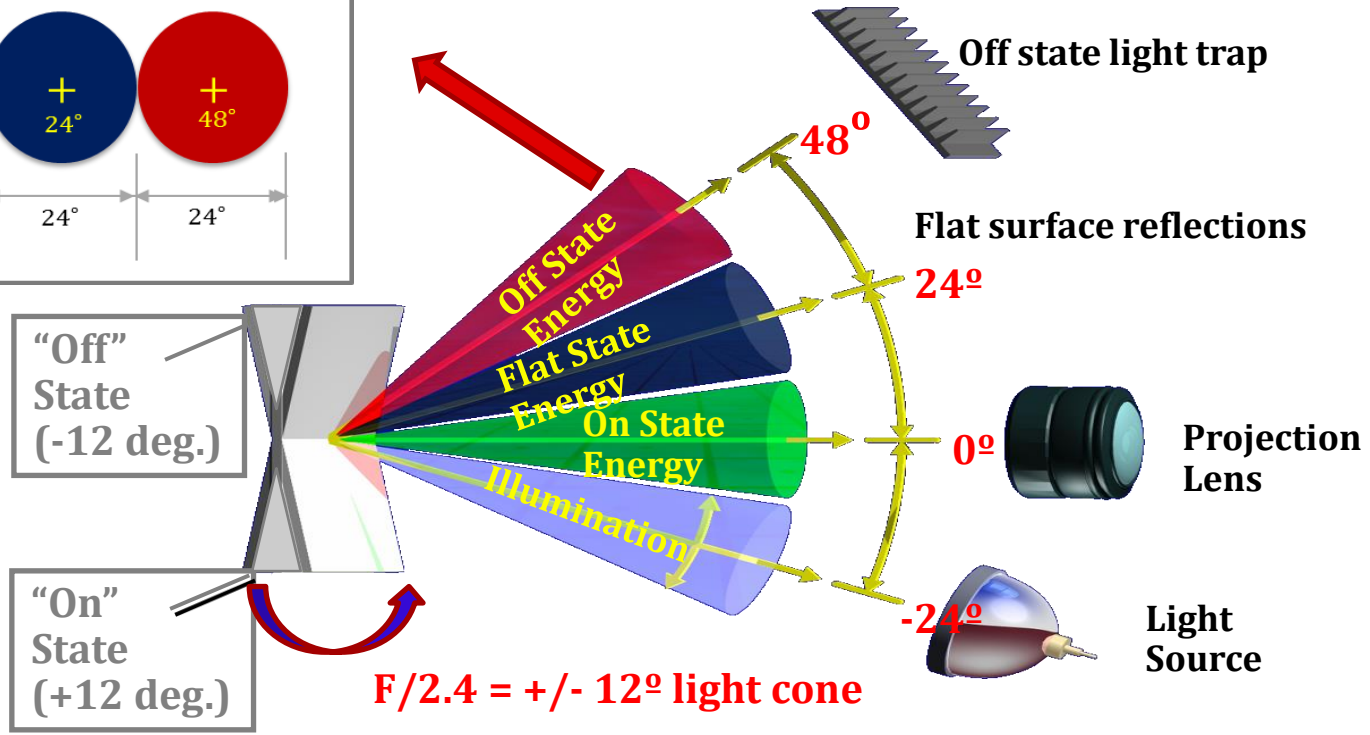
Side Diamond Pixel Architecture



- Pupil size is determined based on the mirror tilt angle and the trade-off between efficiency and contrast
  - Etendue along X ∝ DMD width **x** *SIN(*tilt angle*)* **x** *COS(*angle of incidence*)*
  - Etendue along Y∝ DMD height **x** *SIN(*tilt angle*)*

F/# Limited by DMD Tilt Angle

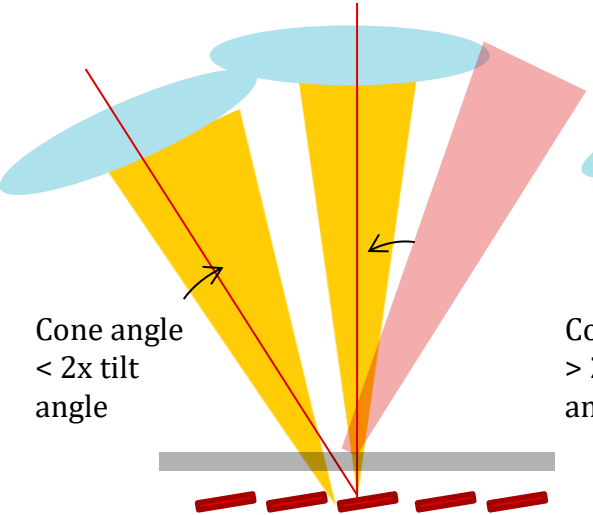




Matching source etendue with DMD

Source etendue<DMD

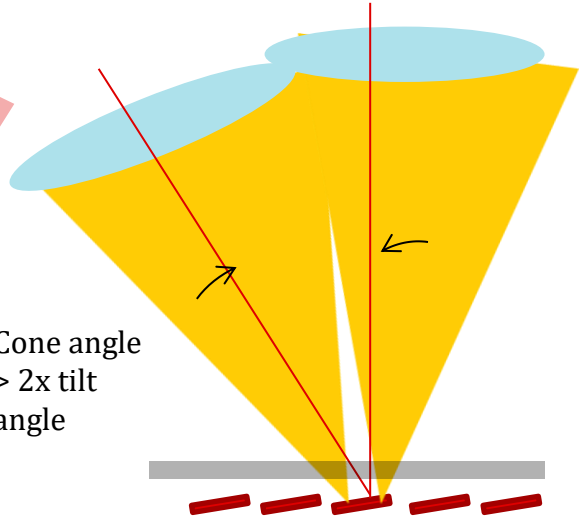
- Small etendue sources (eg laser)
- Larger etendue source would increase brightness
- Capable of high contrast



Cone angle < 2x tilt angle

Source etendue>DMD

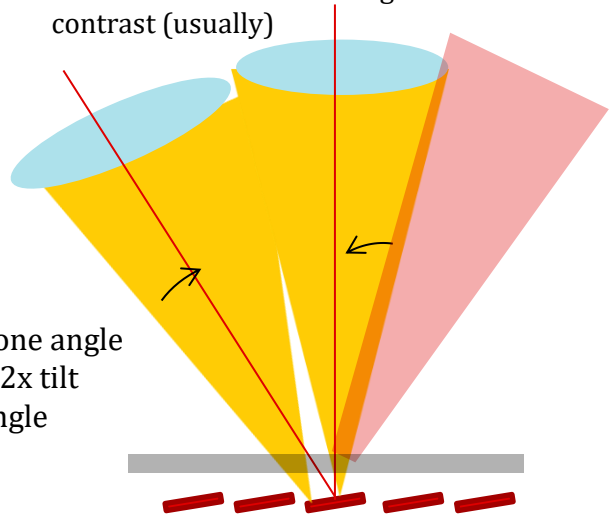
- Large etendue lamps or LEDs
- Have to increase illumination angle to prevent interference with proj.
- High-brightness, but contrast suffer



Cone angle > 2x tilt angle

Source etendue=DMD

- Matched source and DMD etendue
- Some separation between illum. and projection
- Best tradeoff between brightness and contrast (usually)



Cone angle = 2x tilt angle