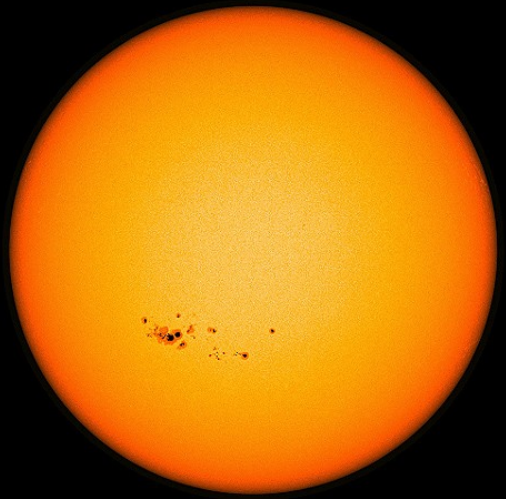
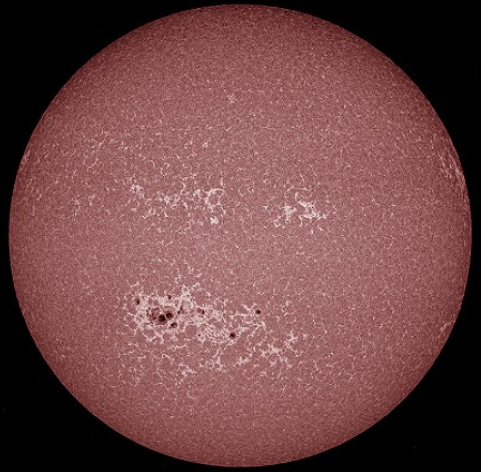
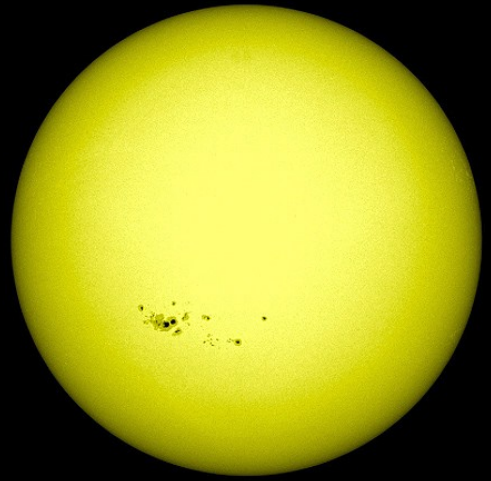
Solar Limb Darkening (in photosphere)



HMI Continuum
Matches visible light
Photosphere

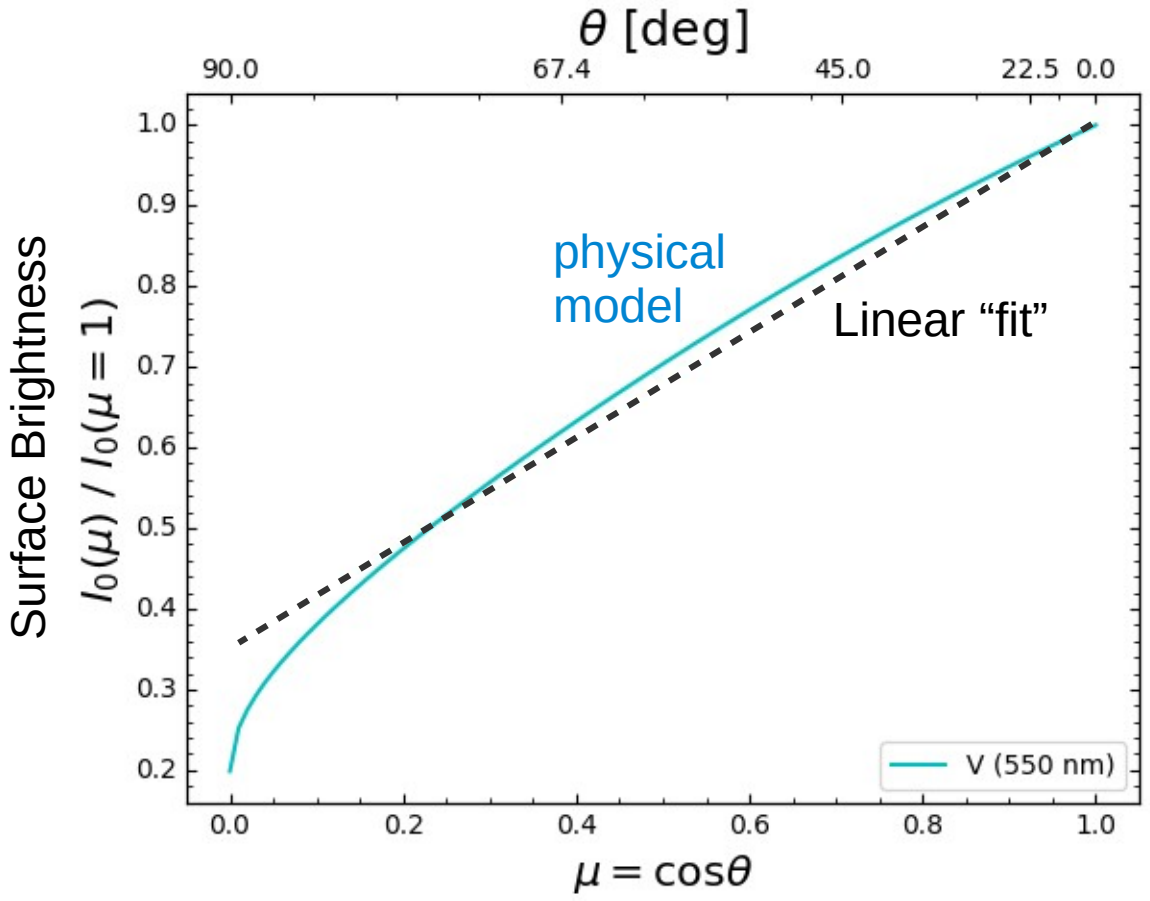


AIA 1700 Å
4500 Kelvin
Photosphere



AIA 4500 Å
6000 Kelvin
Photosphere

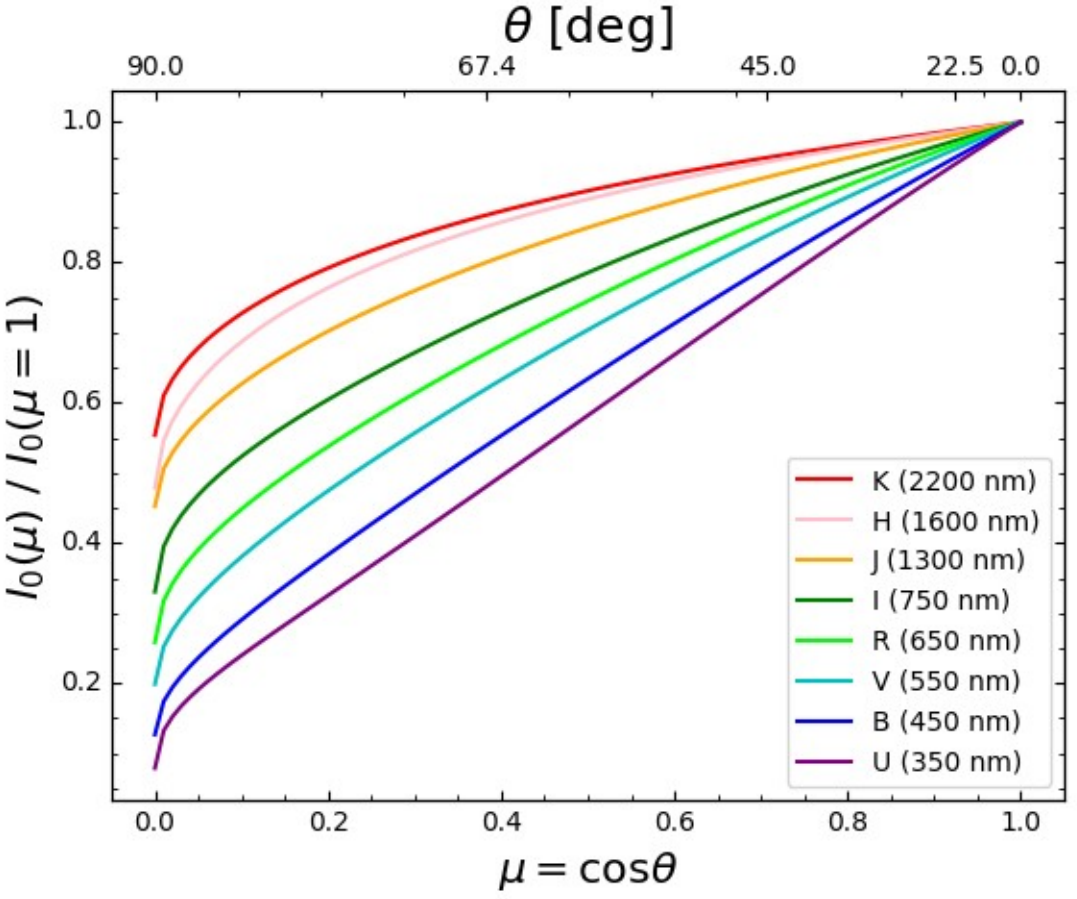
Solar limb-darkening: visible light



A linear model isn’t
a terrible match
at most viewing angles.

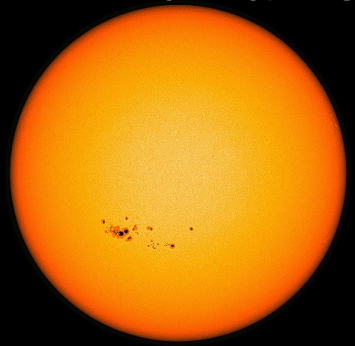
Solar limb-darkening: optical to infrared

Over this wavelength range, longer wavelengths exhibit less limb-darkening (so, they are probing parts of the photosphere where the temperature gradient is weaker).

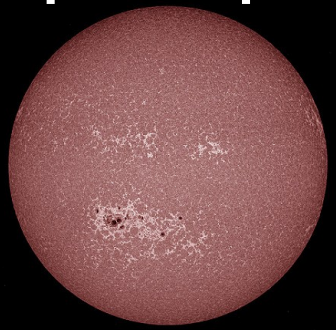


At no wavelength is limb-darkening a linear function of mu – but at some wavelengths it's close.

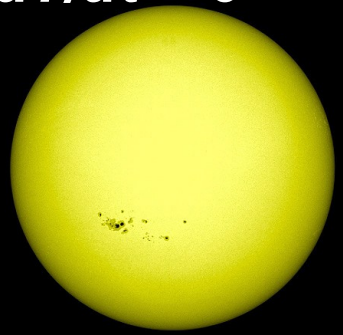
Limb Darkening (in photosphere) – $dT/d\tau > 0$



HMI Continuum
Matches visible light
Photosphere

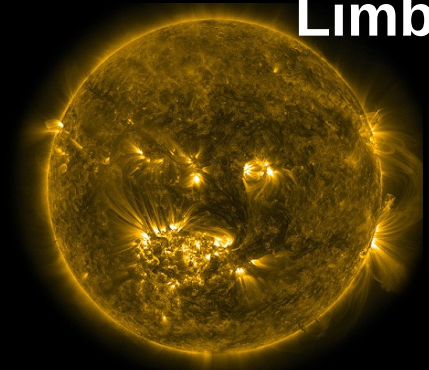


AIA 1700 Å
4500 Kelvin
Photosphere



AIA 4500 Å
6000 Kelvin
Photosphere

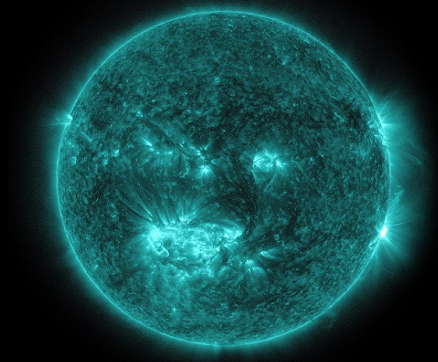
Limb Brightening (in chromosphere & corona) – $dT/d\tau < 0$



AIA 171 Å
600,000 Kelvin
Upper transition
Region/quiet corona

AIA 335 Å
2.5 million Kelvin
Active regions

AIA 094 Å
6 million Kelvin
Flaring regions



AIA 131 Å
10 million Kelvin
Flaring regions