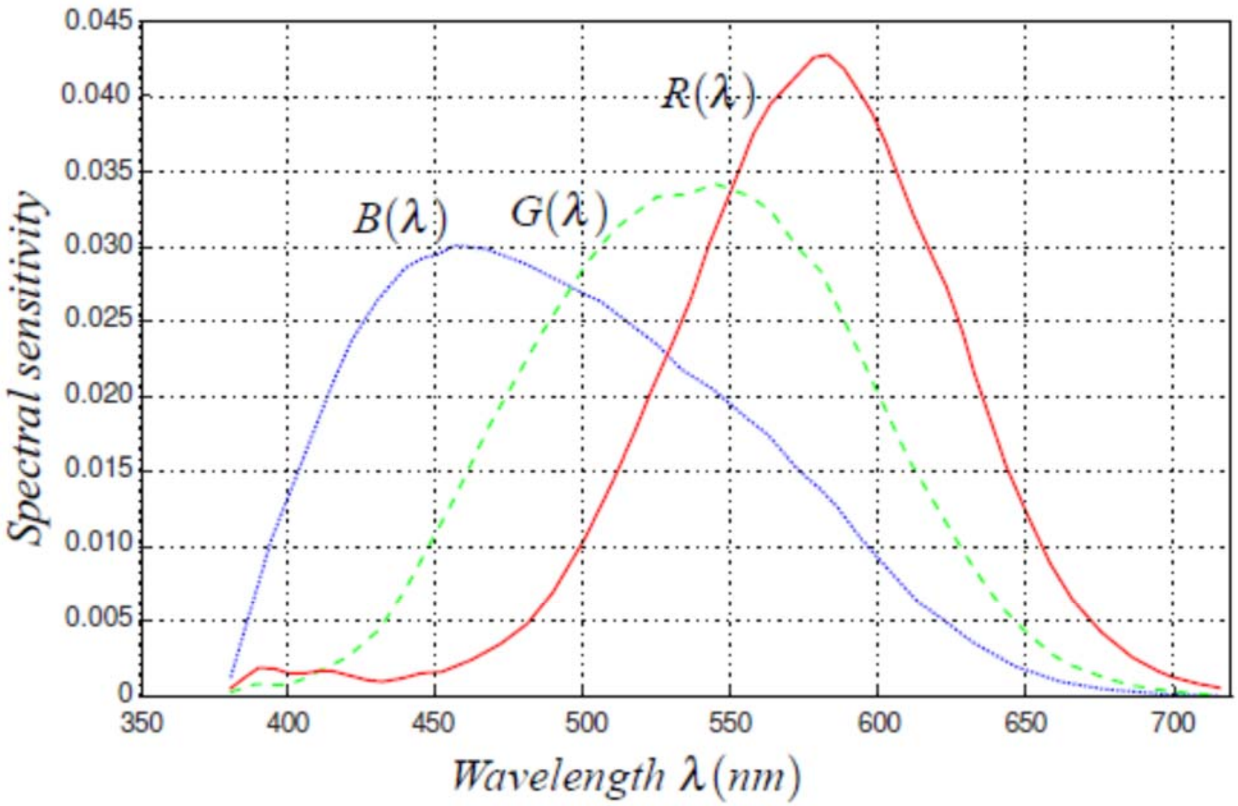
Can we do better in omosaicing

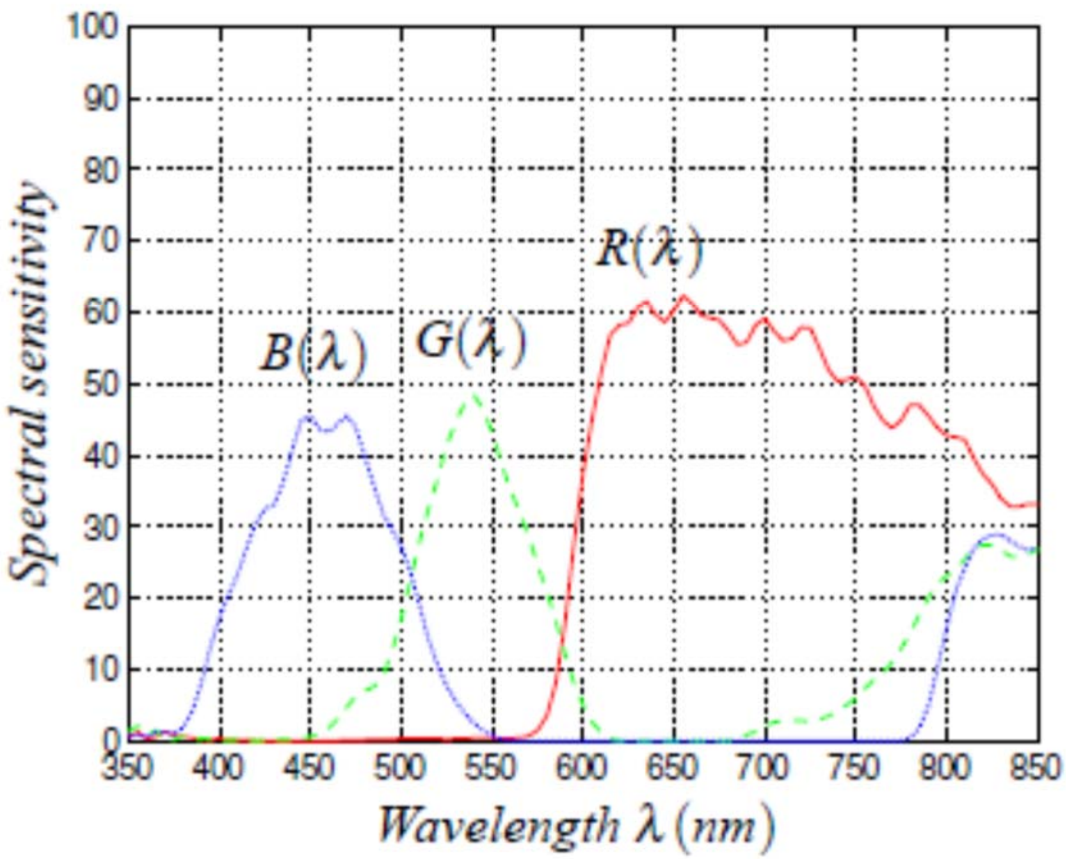
- All demosaicing starts with the bilinear filter
- Basic assumption no color overlap
- But Foveon does far better by measuring all at once
- Look at Foveon response
- Note huge overlaps of green
- Hence can gain more by taking this into account



(b) Relative spectral sensitivity of the Foveon X3 sensor endowed with an infrared filter (Lyon and Hubel, 2002).

Color filters in the Camera

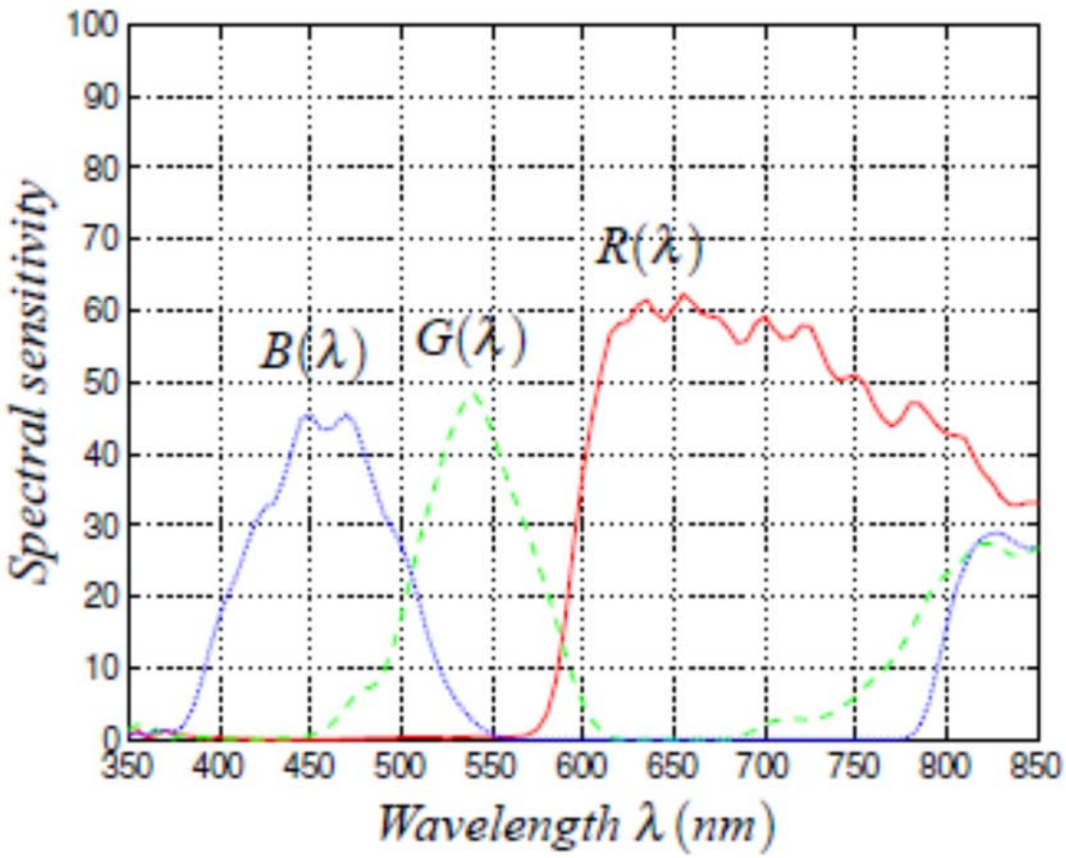
- There is substantial overlap with typical color filtes
- But Bilinear assumes no
- Ie G has no R or B values
- But this is not true
- Consider Typical sensor
- Peak wavelengths Blue 450 nm, Green 540 nm, Red 640 nm
- Note at IR range R goes from 700 nm up
- Green starts at 700 nm, Blue at 780 nm
- Blue sees Green to 550 nm – sees no Red
- Green see Blue to 450 nm
- Green sees Red to 620 nm
- Red sees Green to 560 nm – sees no Blue



(b) Relative spectral sensitivity of the Kodak KLI-2113 sensor.

Note the InfraRed behaviour of filters

- Note at IR range R goes from 700 nm up
- Green starts at 700 nm,
- Blue at 780 nm
- Heat mirror cuts off typically at 770 nm
- If remove heat mirror
- Add IR filter (rejects visible) and can see IR images



(b) Relative spectral sensitivity of the Kodak KLI-2113 sensor.

CFA interploation

- Bayer (CFA) is a 2x2 array
- Bilinear uses 3x3
- Problem not an even Bayer set
- Consider 4x4 array – 2x2 Bayer sets
- Problem not centered – larger area
- Consider a 5x5 now centered but not Bayer even set
- Also more area
- How many do we get for parameters