

PWW-P4 - A new Colour Gamut Proposal for Digital Cinema Presentation and UHDTV

Kommer Kleijn SBC

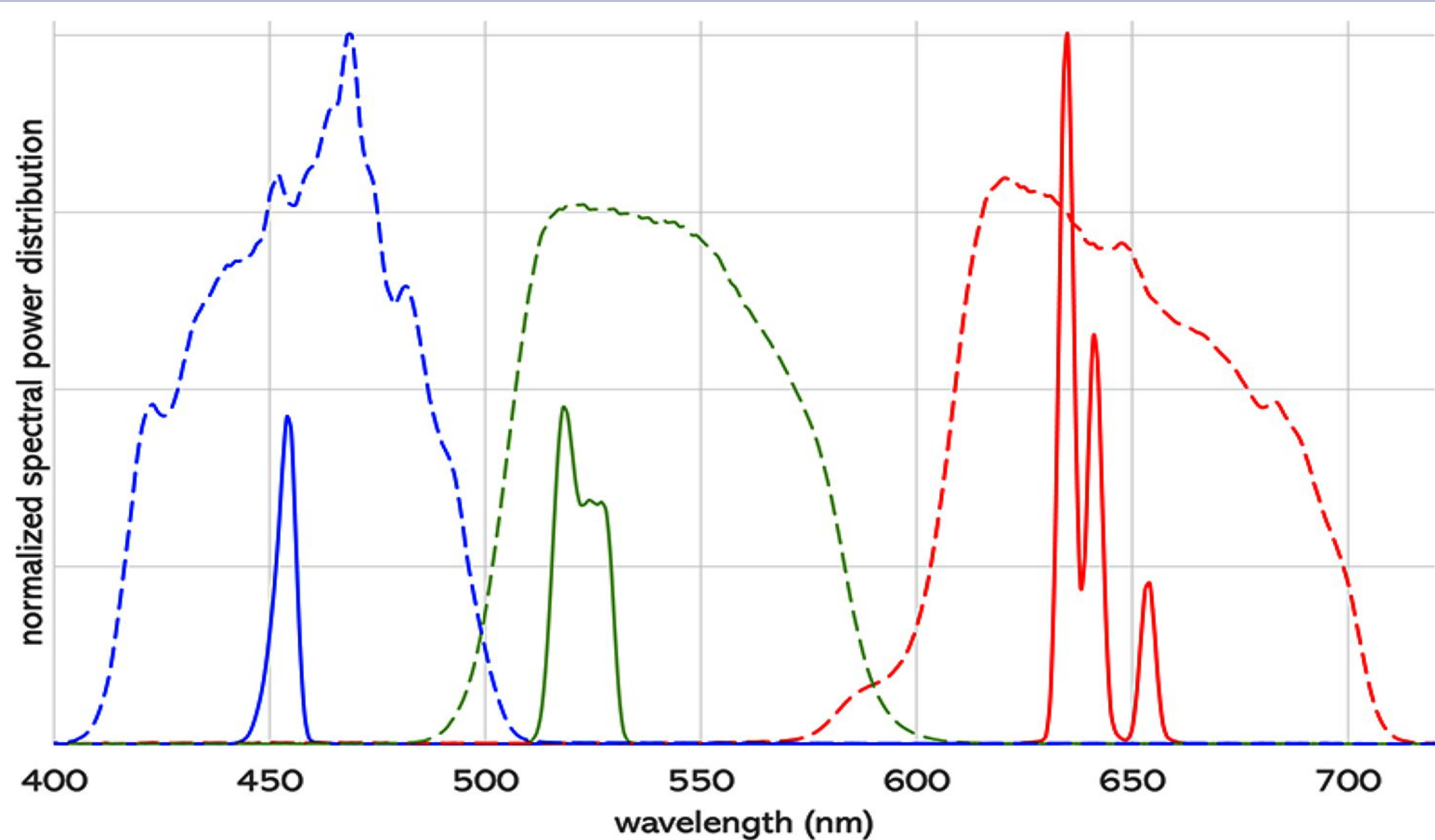
Peter Wilson HDDC, John Watkinson FAES

www.kommer.com

kommer@kommer.com

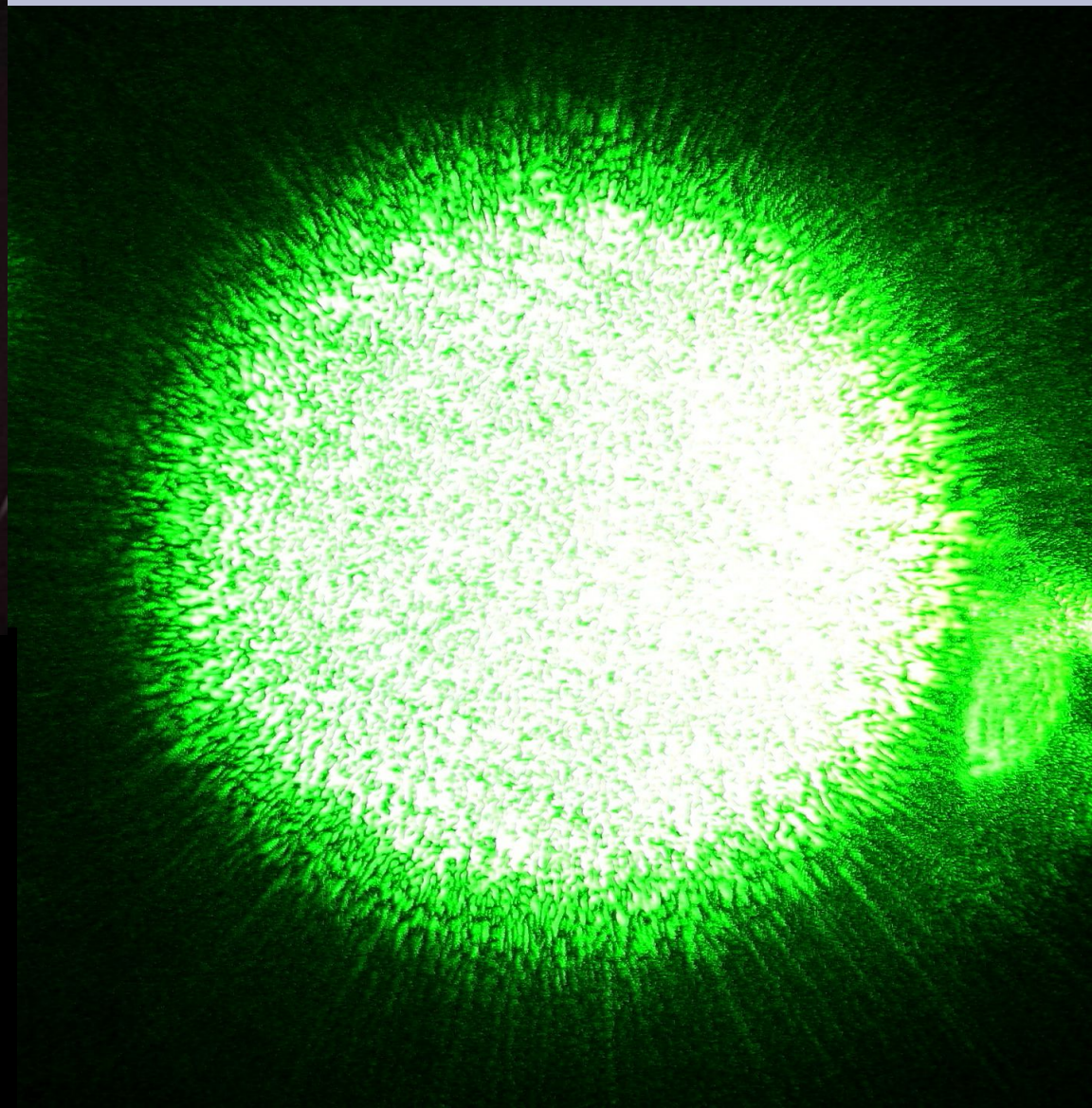
**IMIS “Metamerism 2026” Conference
London Film School, October 6th, 2026**

Arrival of Laser light sources for projection





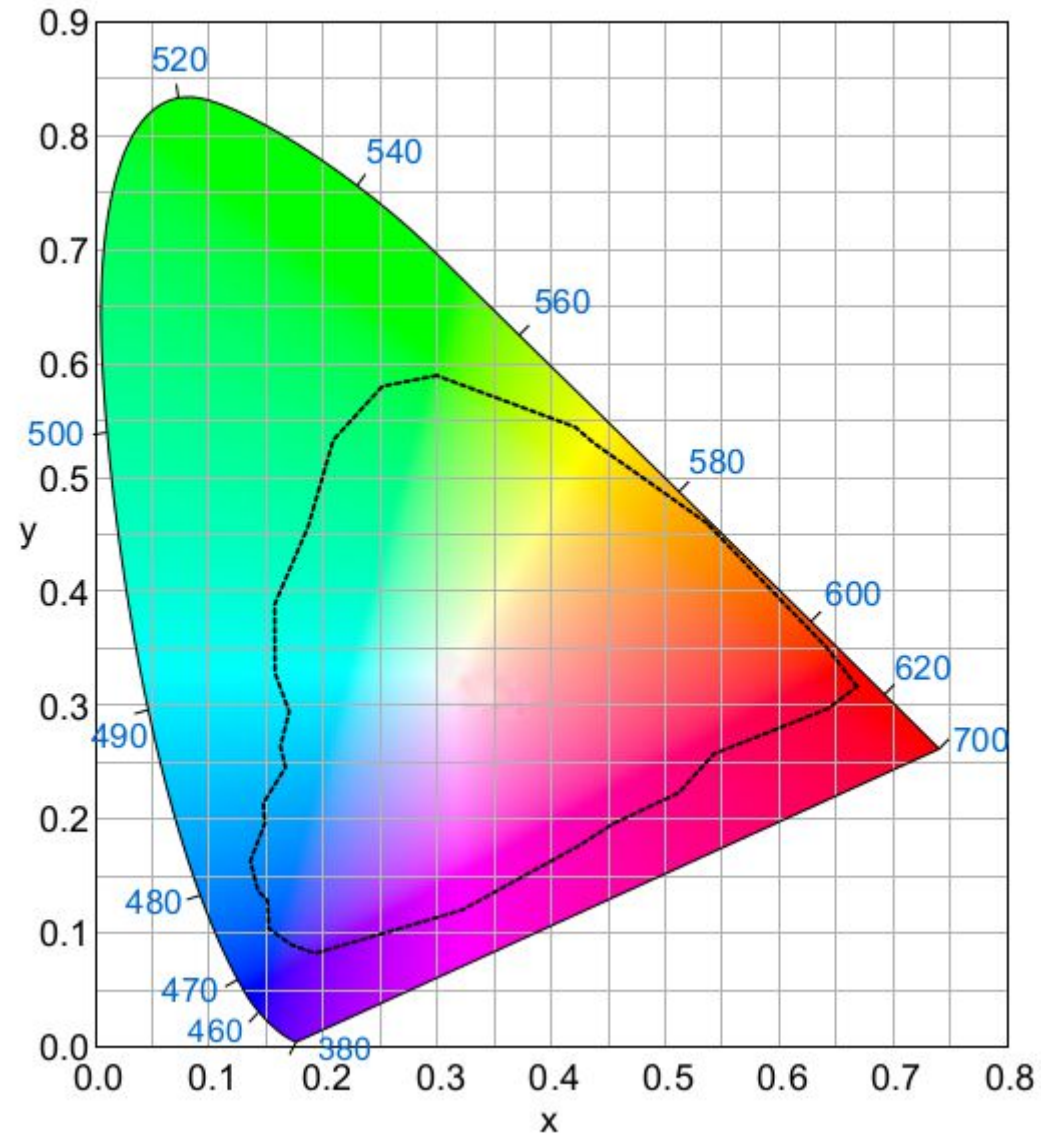
Storyline



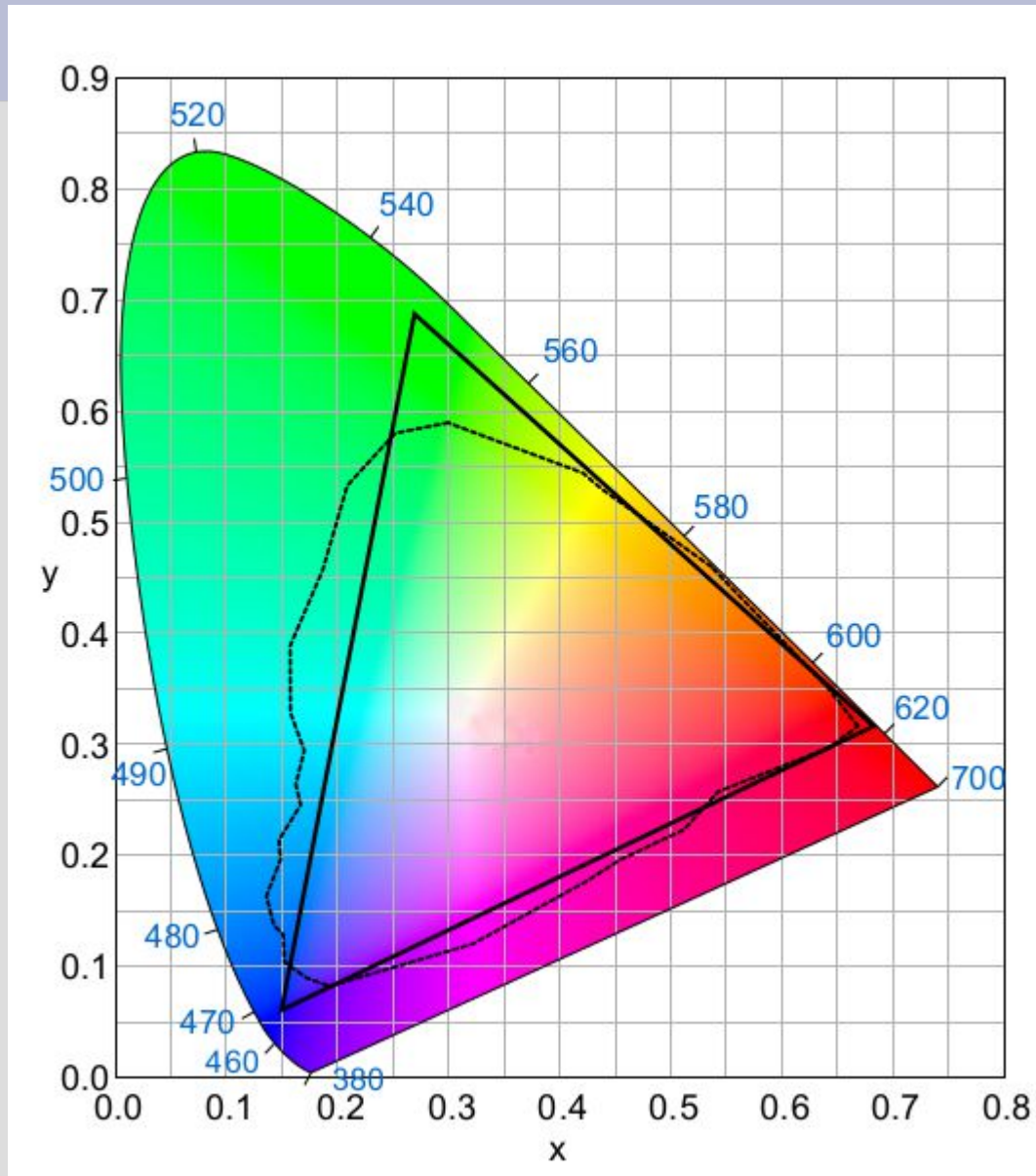
Arrival of Laser light sources for projection

- Less power consumption, less cooling, quiet operation, less maintenance
- But also: narrow bandwidth RGB light can provide (render) more colours
- Phosphor laser provides spectral light like the Xenon lamp does and can provide most laser advantages without any of the problems.
- Except for these additional colours !!
- That last thing is what this proposal is about: A way to reproduce more colours, while avoiding the problems of narrow bandwidth light sources
- Or **how to do Wide Colour Gamut (WCG) with phosphor laser**
- Analog print film could do it, so there had to be a solution !!

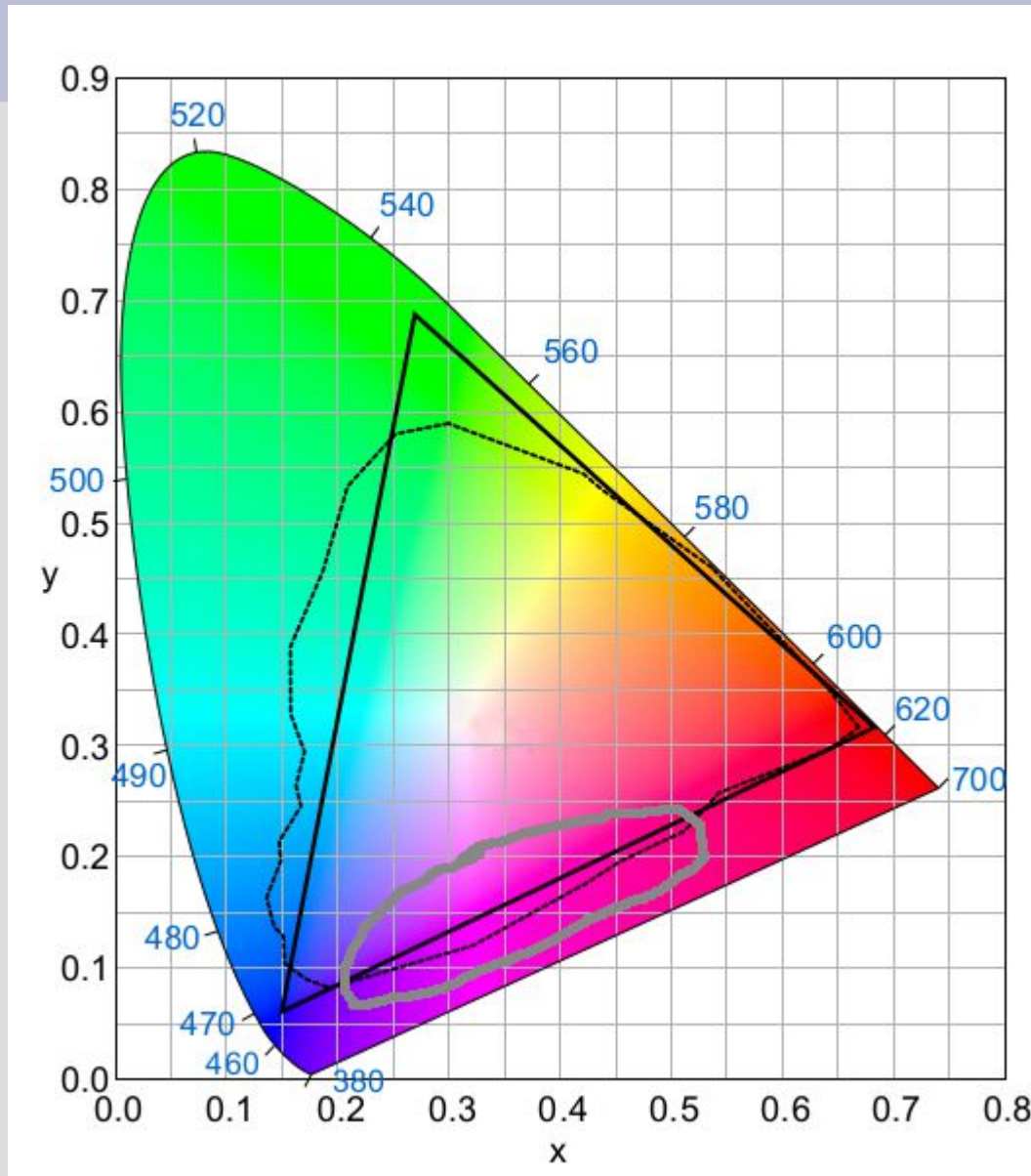
Pointer's Gamut



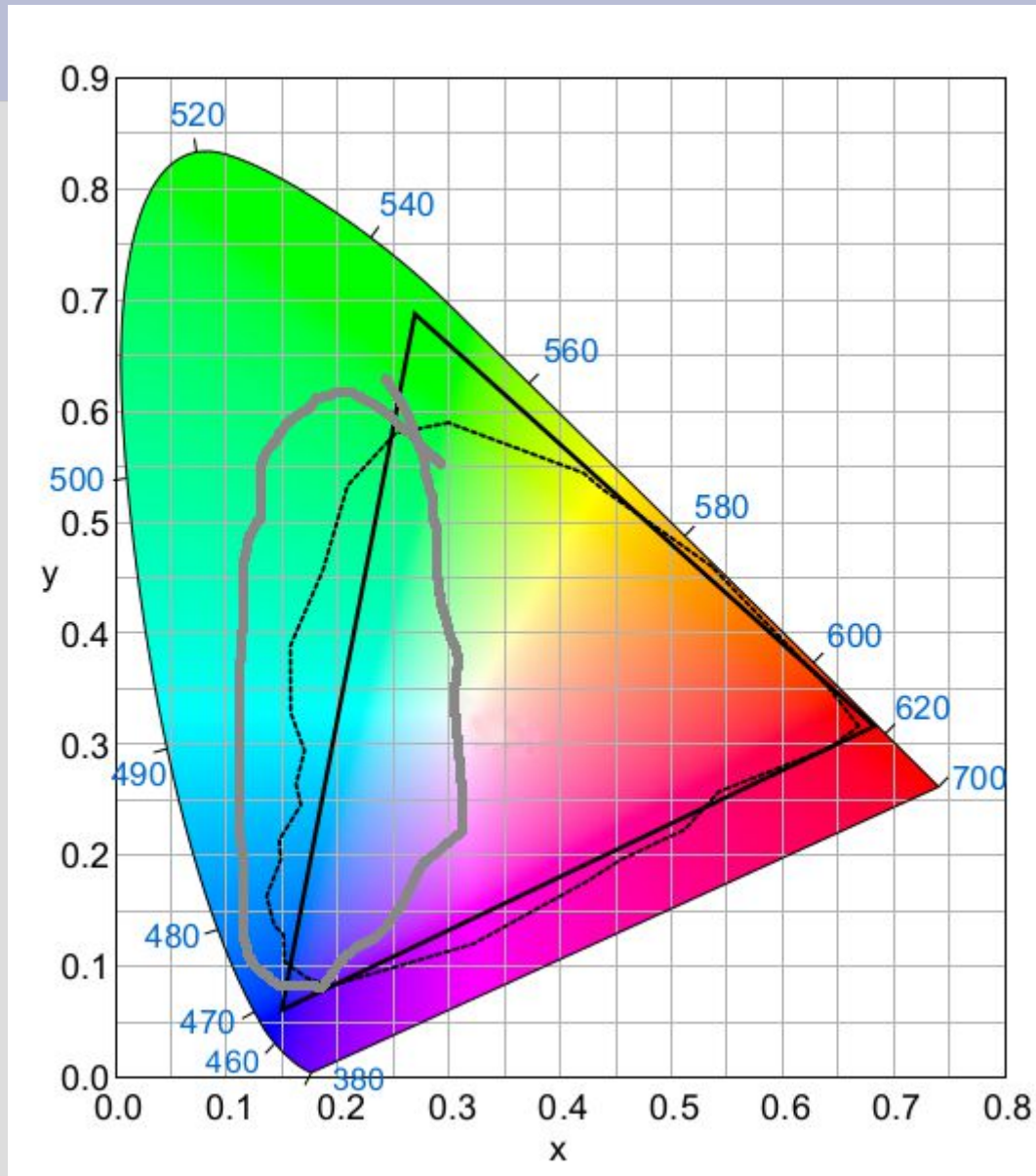
DCI-P3 Colour Gamut



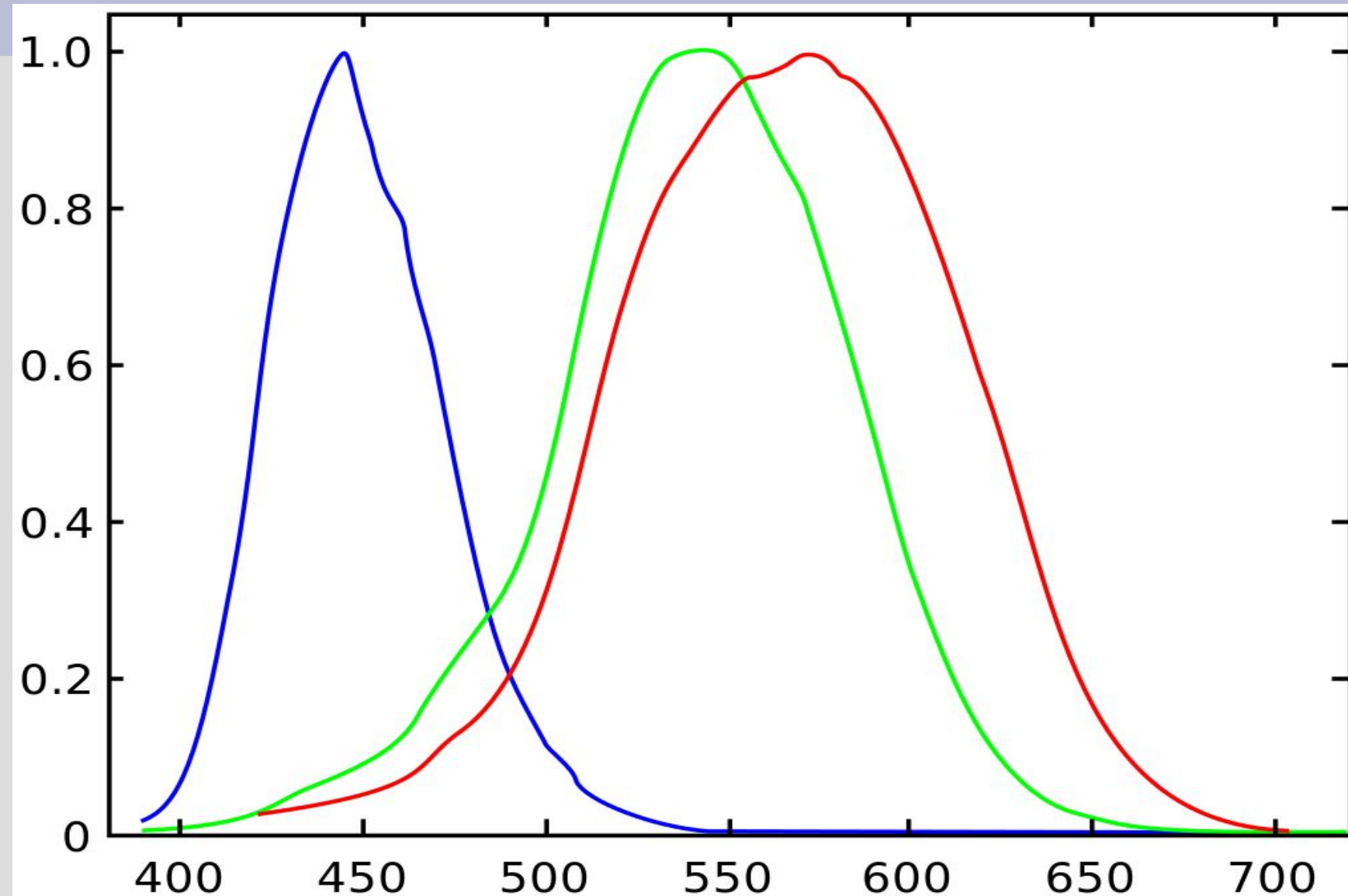
DCI-P3 Colour Gamut



DCI-P3 Colour Gamut

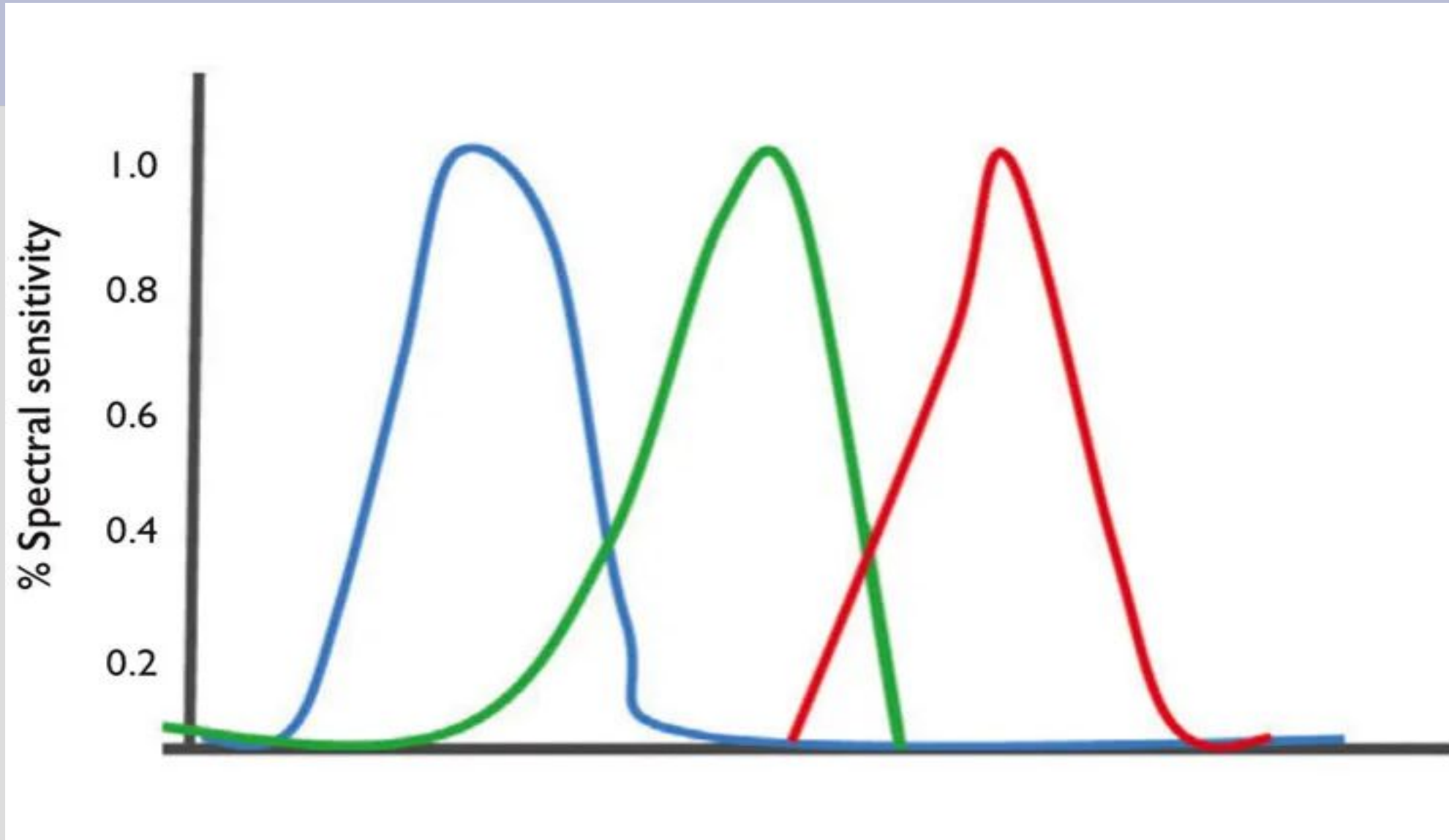


Human Retina Average Spectral Sensivity is quite different from ...



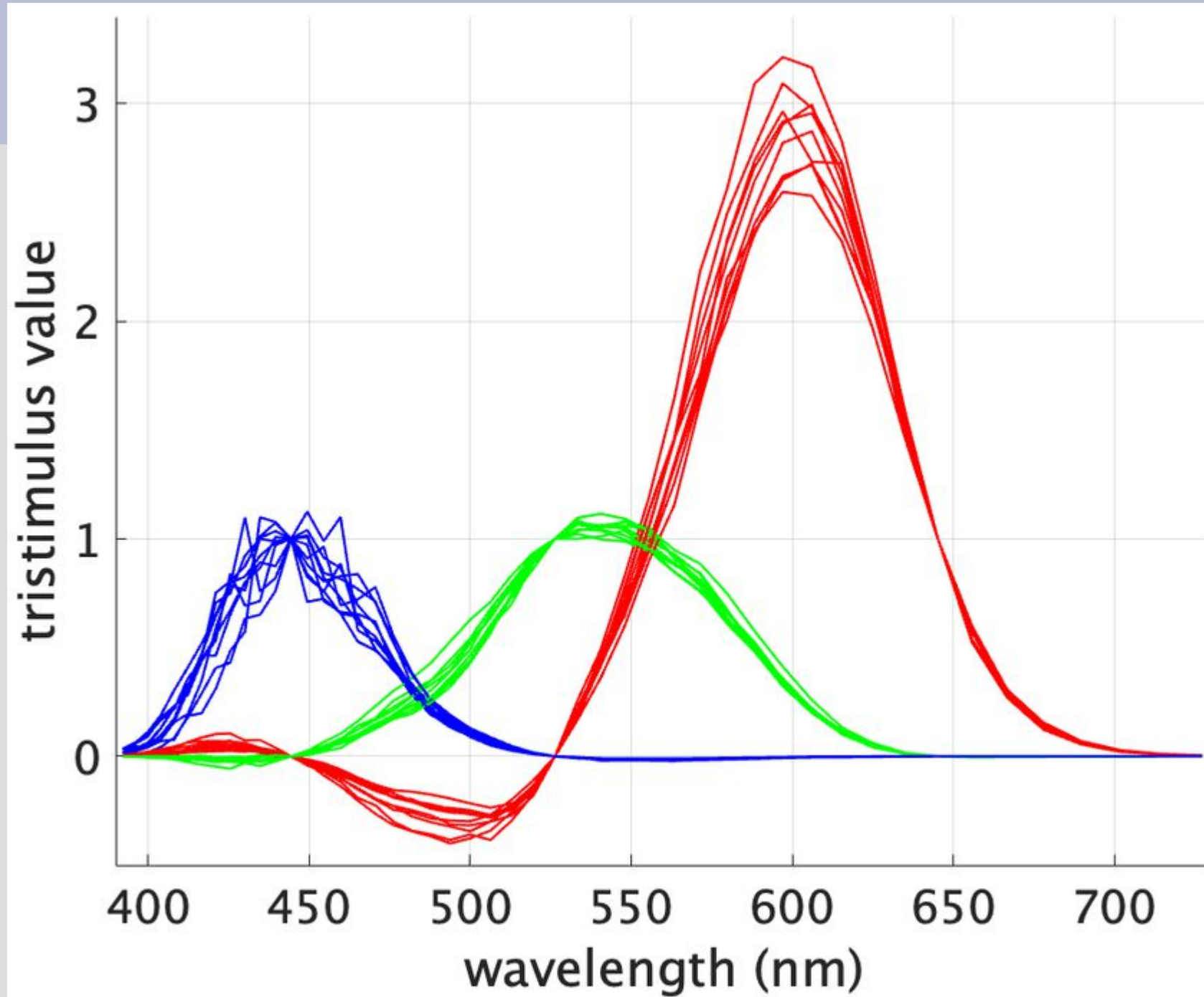
Picture source: https://en.wikipedia.org/wiki/Spectral_sensitivity

f.e. a Digital Camera Average Spectral Sensivity

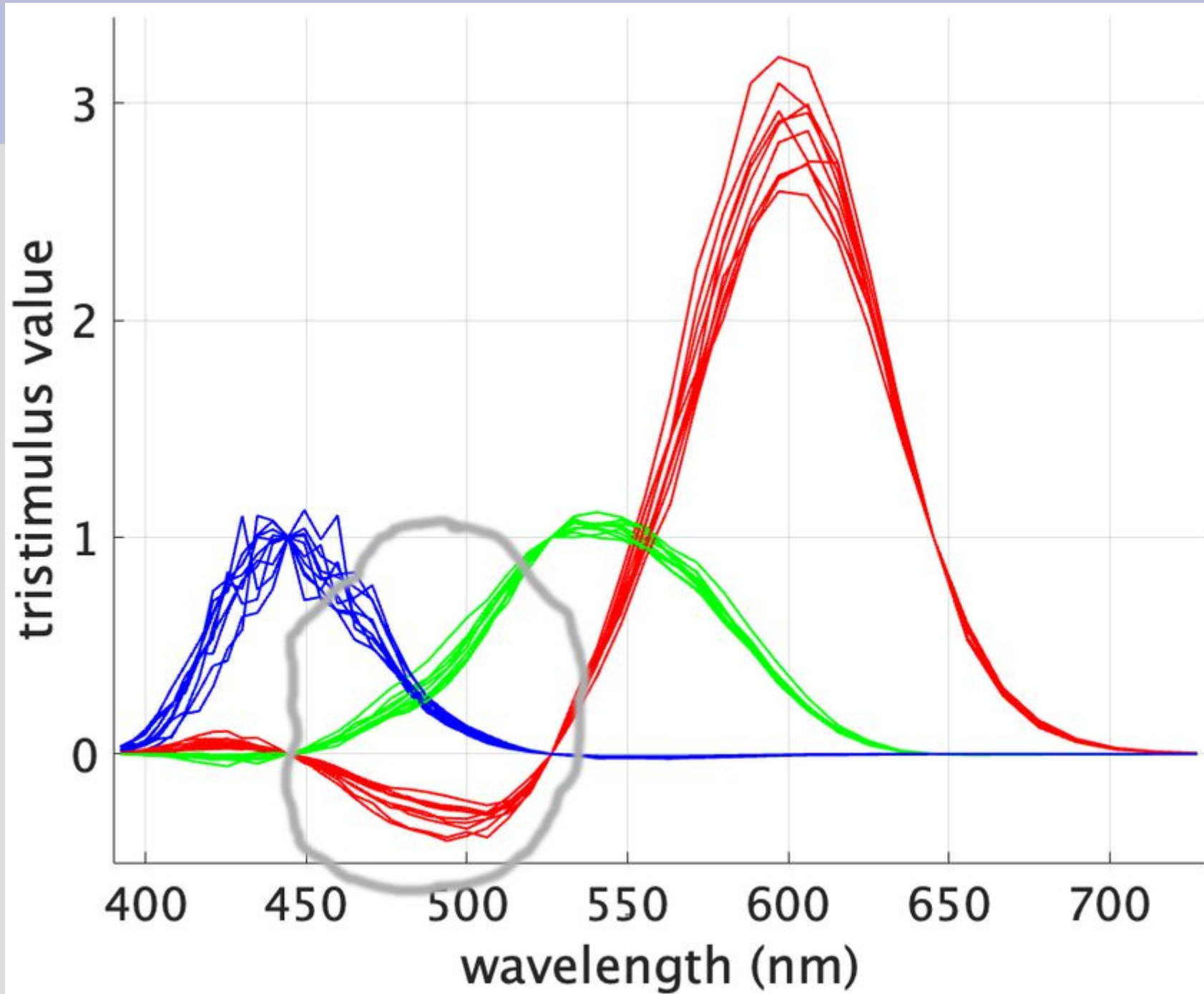


Picture source: <https://www.techbriefs.com/component/content/article/tb/supplements/pit/features/technology-leaders/36142>

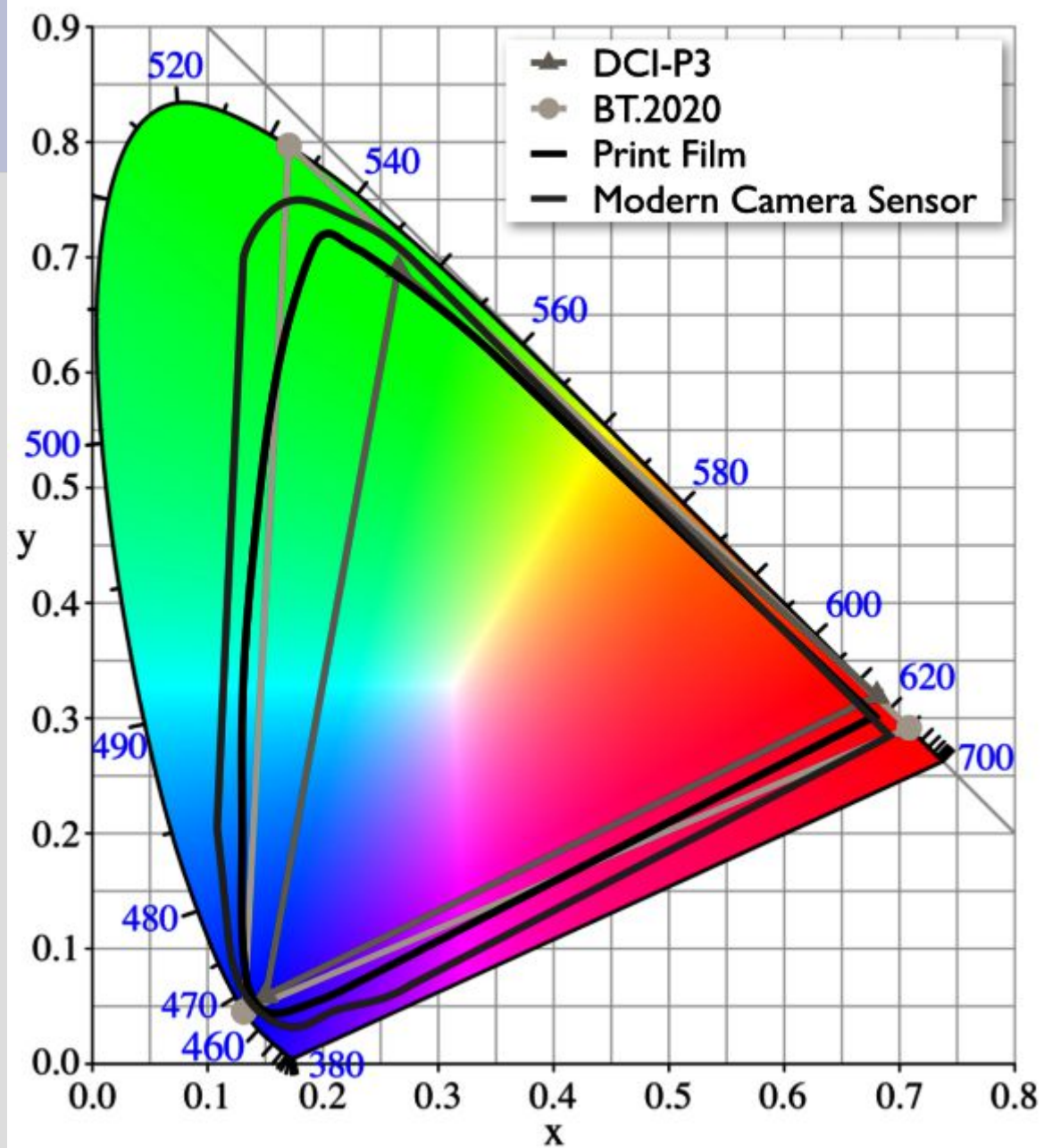
“Negative” values in RGB CMF functions



“Negative” values in RGB CMF functions

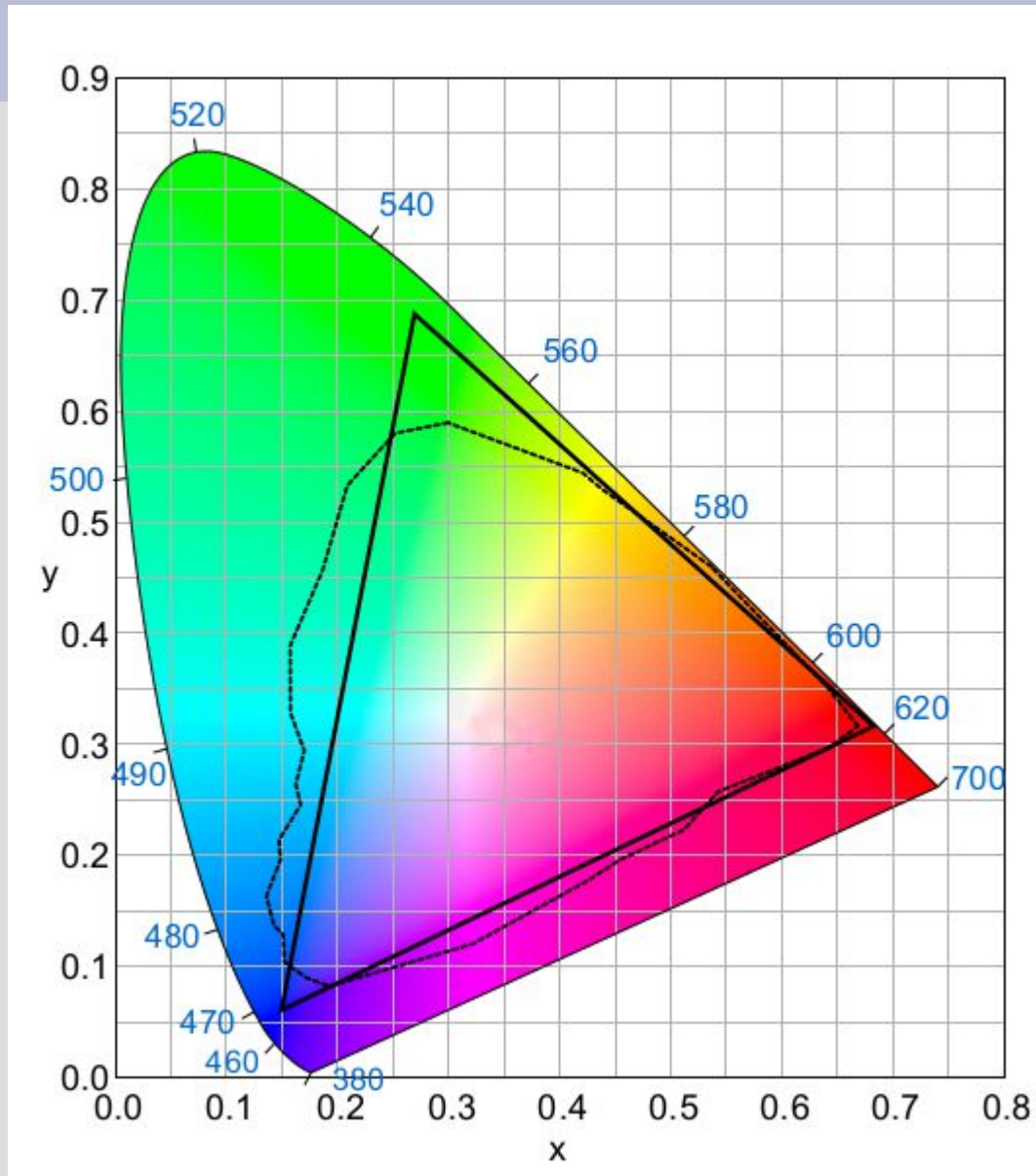


Film & Digital Gamuts

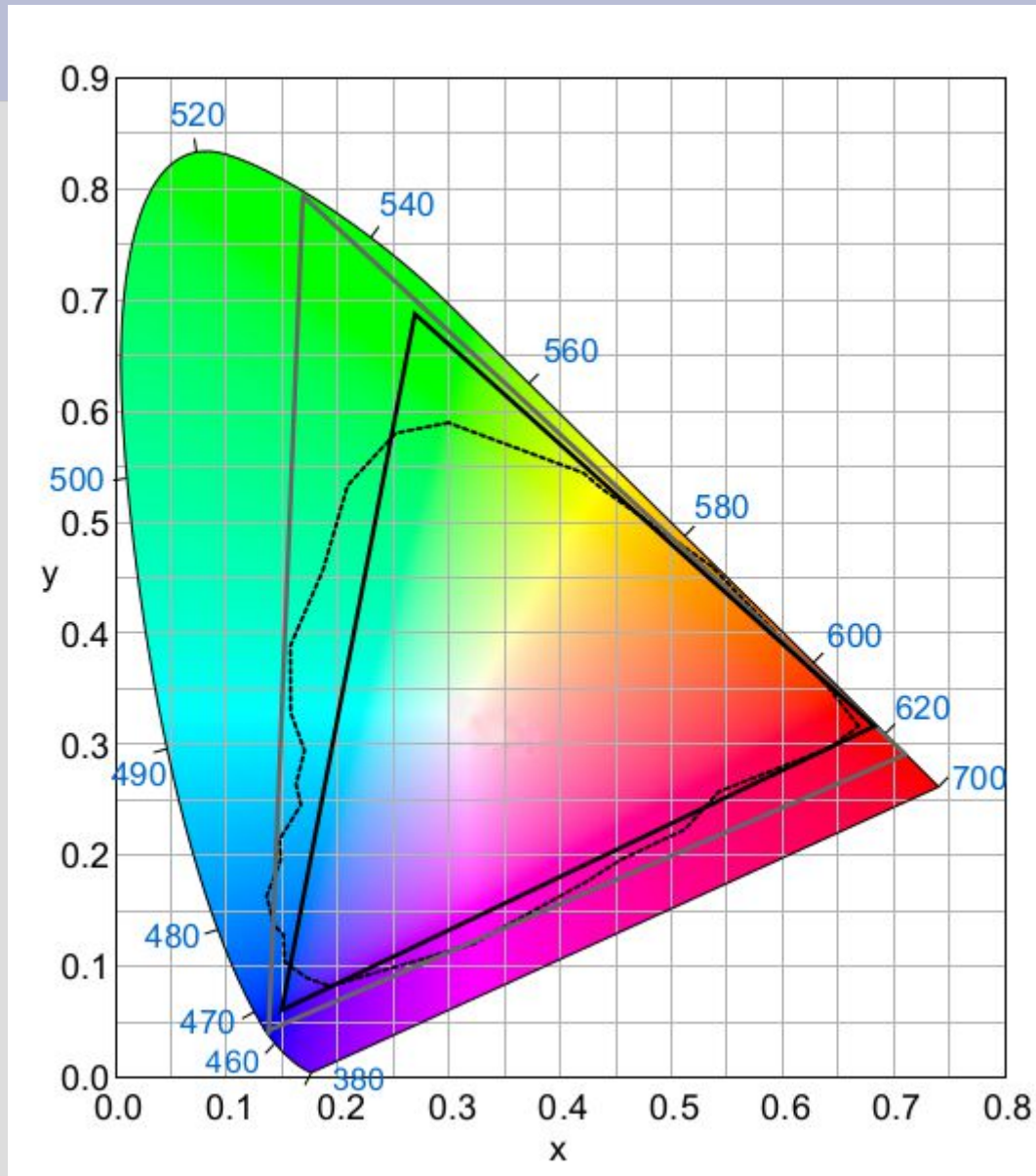


Source: Sony

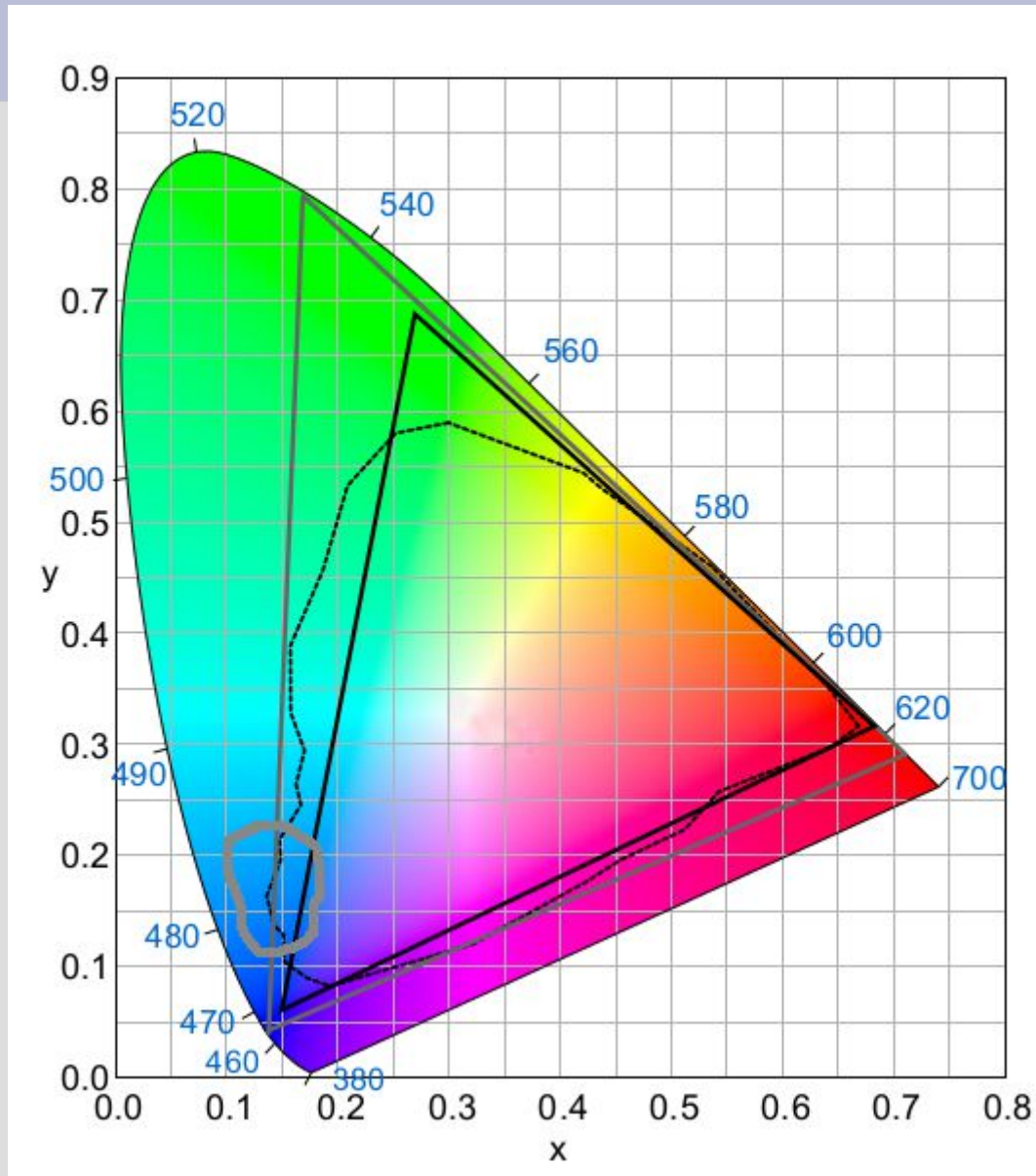
DCI-P3 Colour Gamut



REC 2020 Color Space

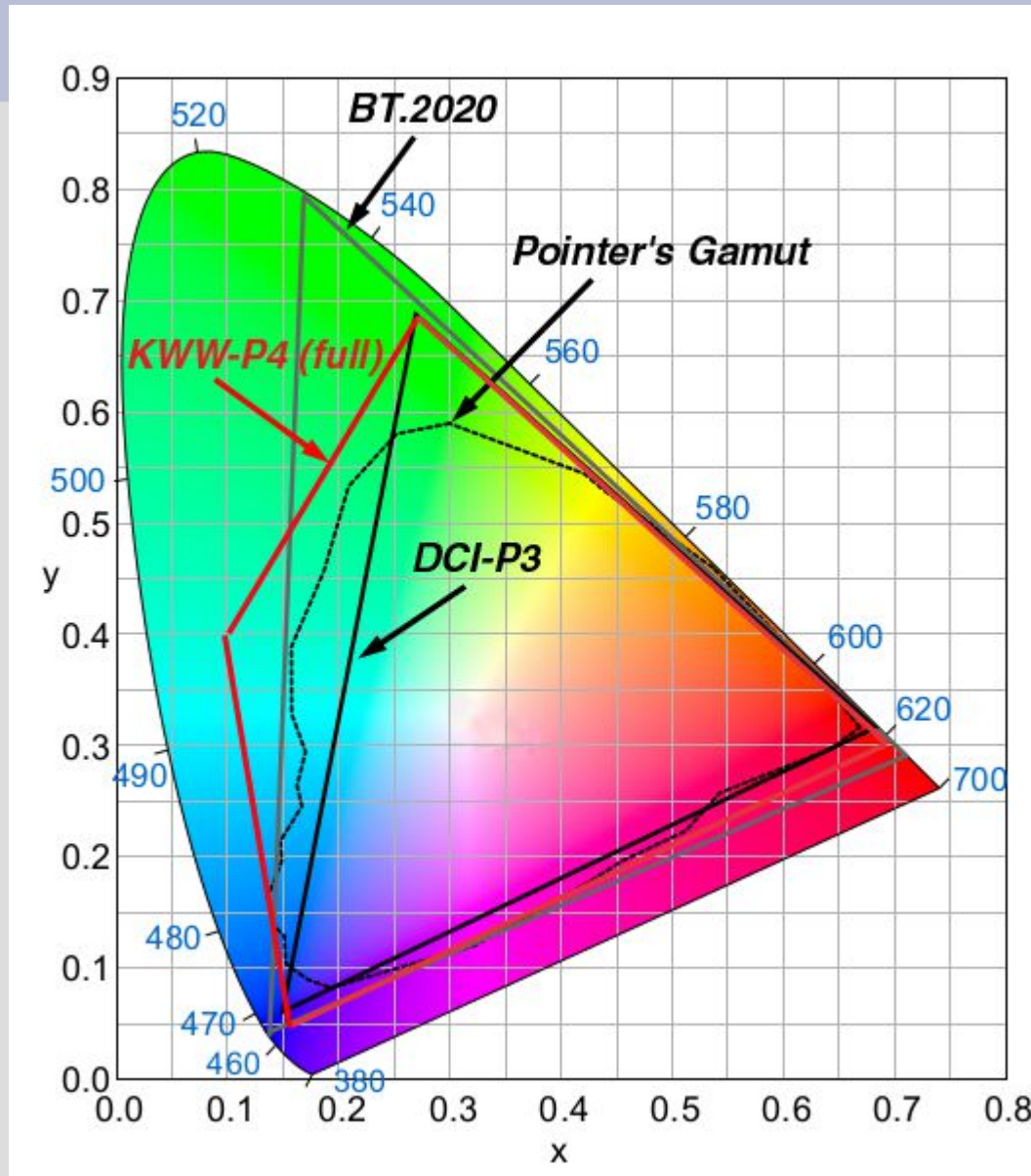


REC 2020 Color Space



KWW-P4 Colour Gamut (full)

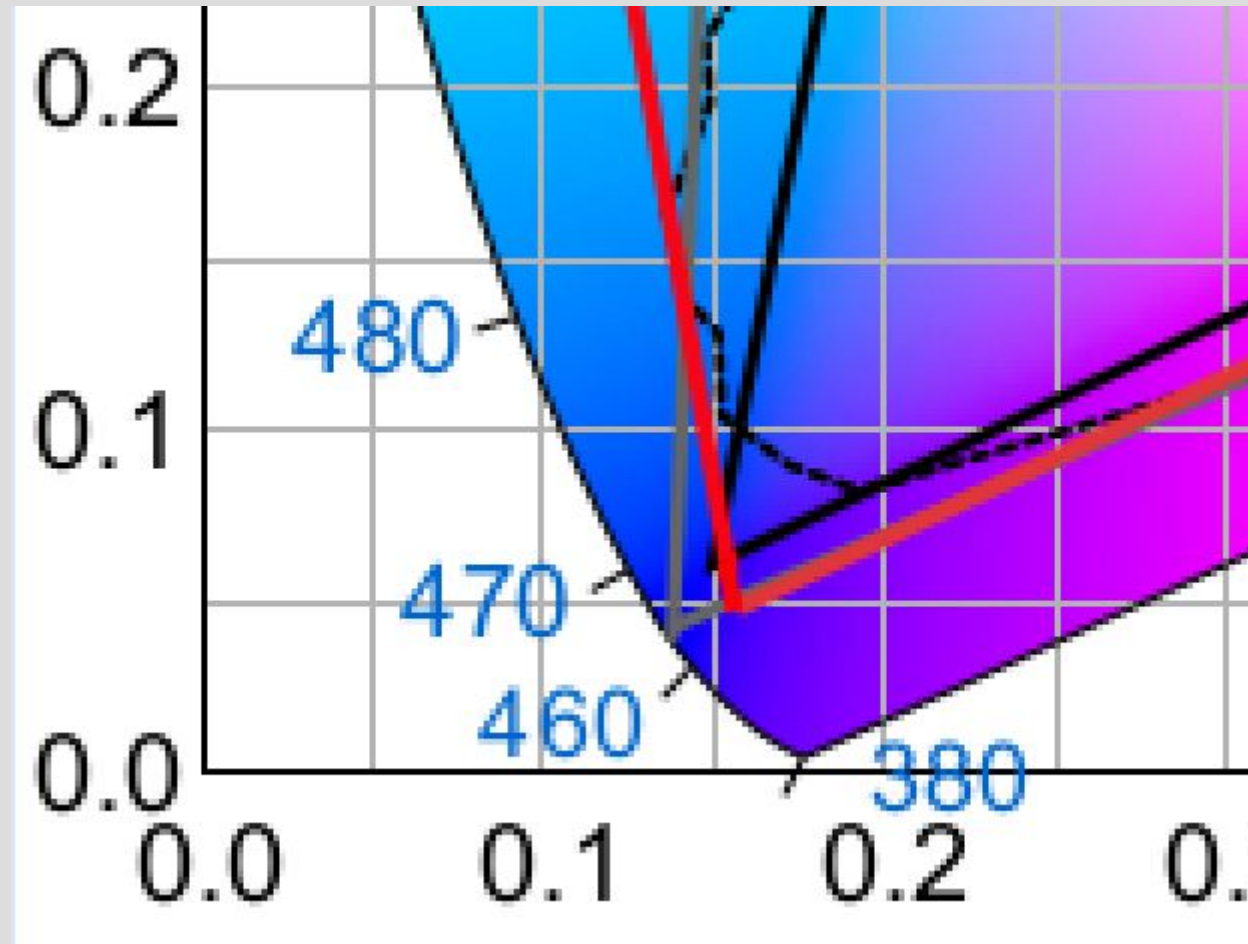
CYAN
X=0.1
Y=0.4



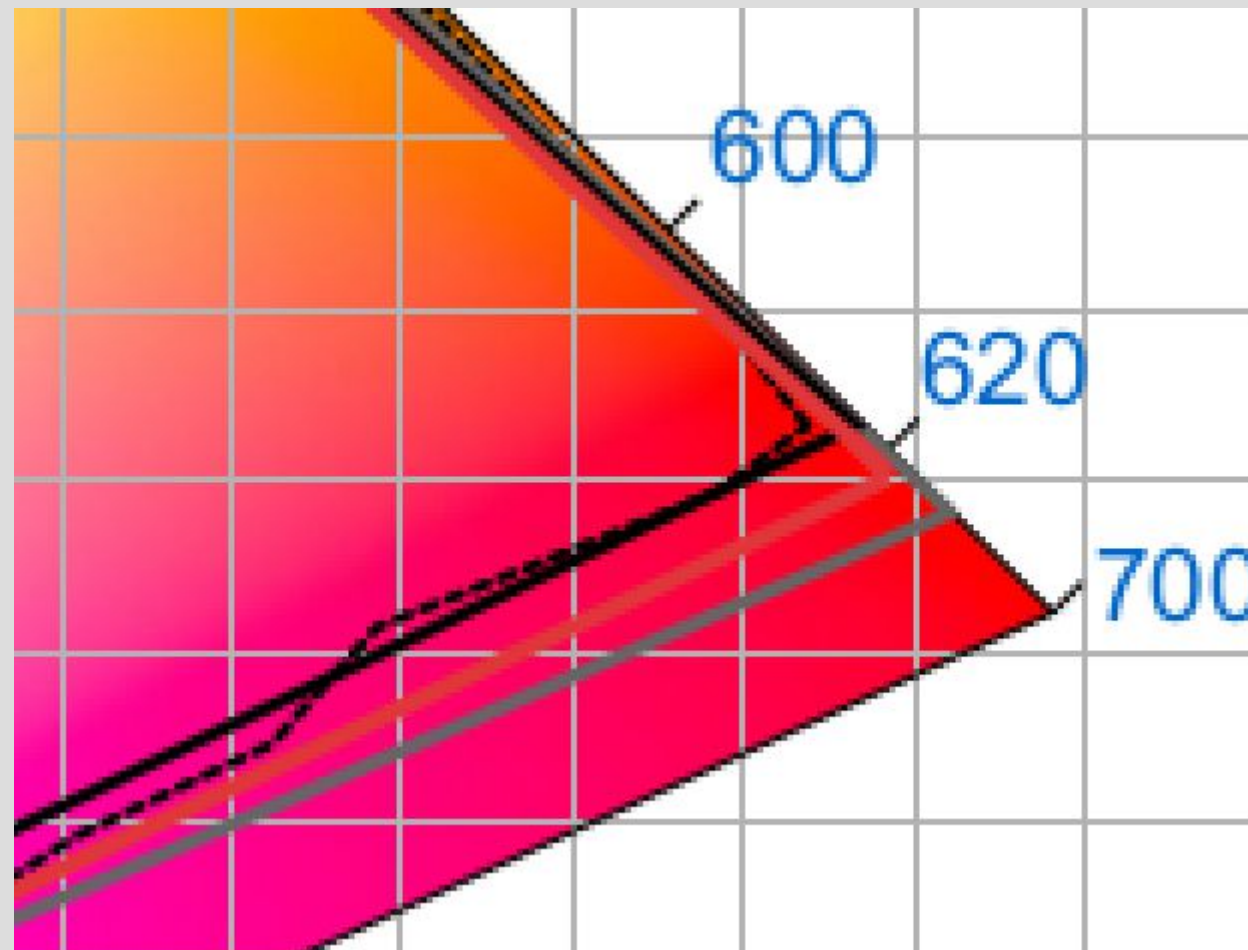
GREEN
X=0.265
Y=0.69
(same as P3)

KWW-P4 Colour Gamut (full)

BLUE
 $X=0.155$
 $Y=0.05$



KWW-P4 Colour Gamut (full)



RED
X=0.675
Y=0.3

Advantages of the KWW-P4 Colour Gamut

- Primaries that can be created with spectral light, avoiding the problems of metameric failure, colour fringing, resolution loss, speckle, etc.
- Reproduction of all colours of the Pointer's Gamut. As good as REC.2020 maybe even slightly better
- Compatible with phosphor laser, phosphor LED, possibly also hybrid laser
- Compatible with existing cameras, encoding standards, file formats, and transmission standards. No fourth channel needed ahead of presentation.
No changes needed to existing work flows except for projectors / screens
No changes needed to existing file-, encoding-, or distribution standards
- Backwards compatible with existing encoded content: P3, REC2020, 709

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Thank you for your attention

Please feel free to contact me on

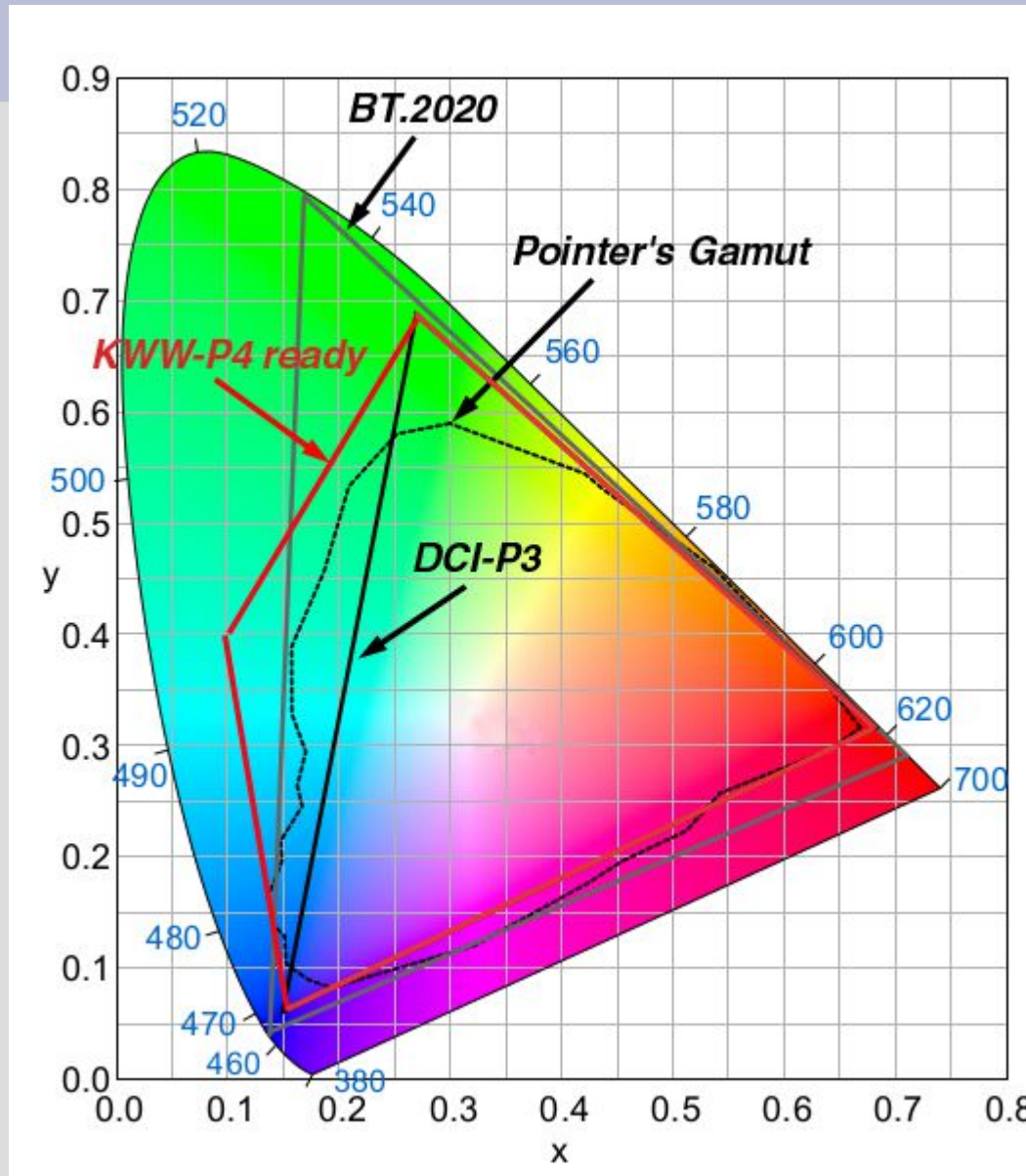
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“KWW-P4 ready” transitional Colour Gamut

CYAN
 $X=0.1 - 0.15$
 $Y=0.4$

BLUE
 $X=0.15$
 $Y=0.06$
(same as P3)



GREEN
 $X=0.265$
 $Y=0.69$
(same as P3)

RED
 $X=0.68$
 $Y=0.32$
(same as P3)