

# Pandemic Patterns: *Rapid Tests for Viral Video*

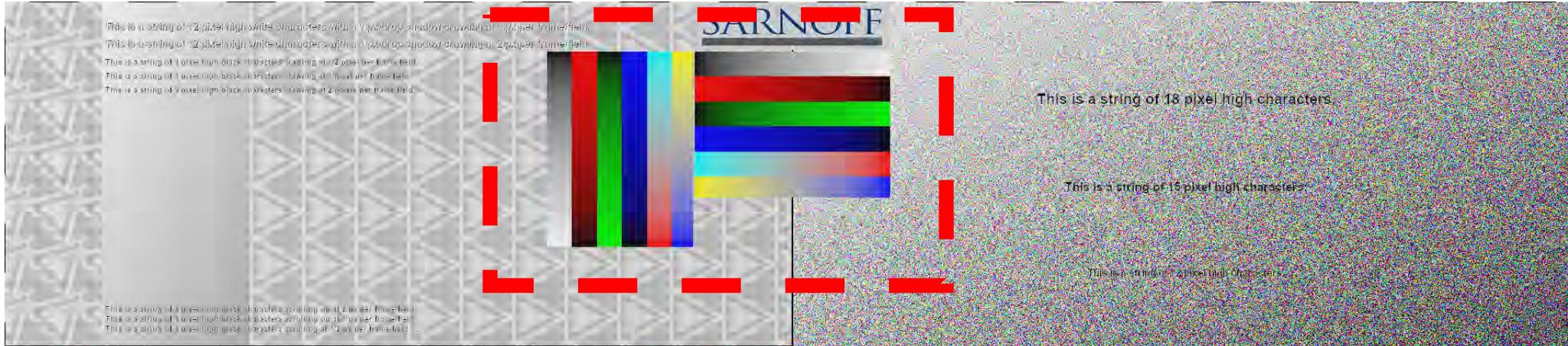
Norm Hurst, SRI International

HPA 2022

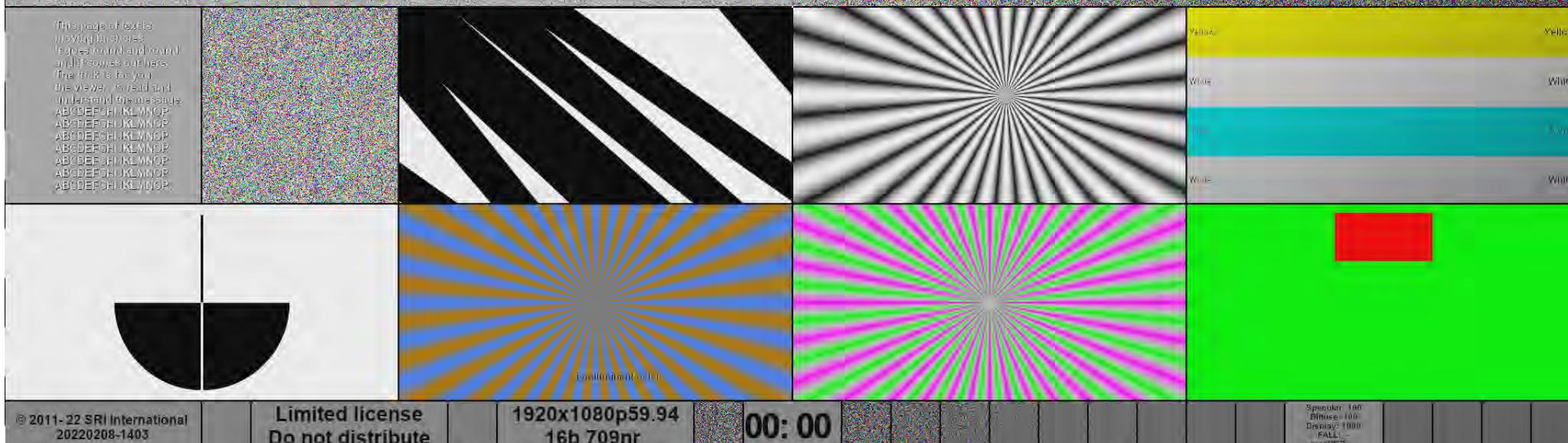
Pattern 1 of 2

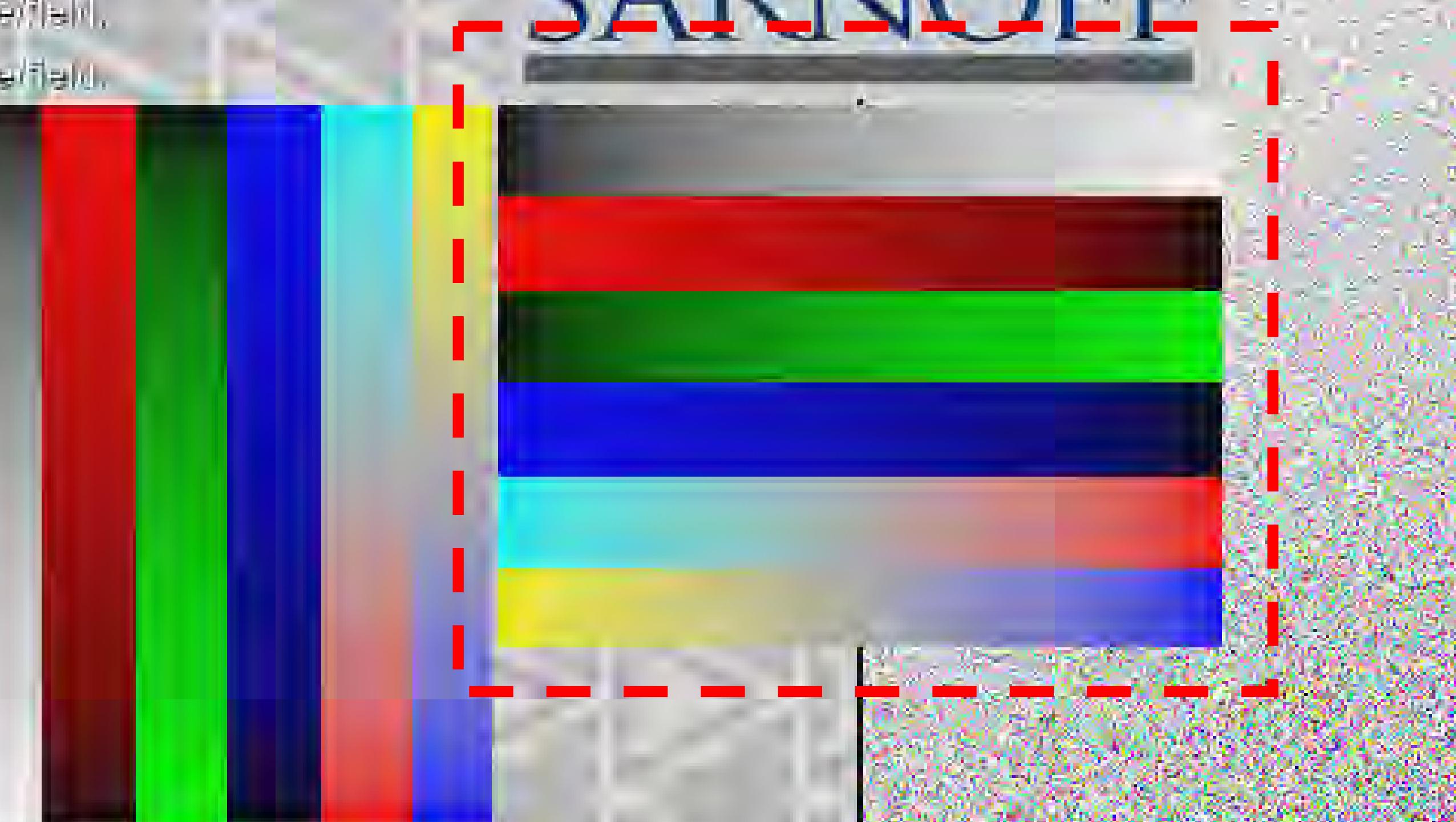
Inspiration:

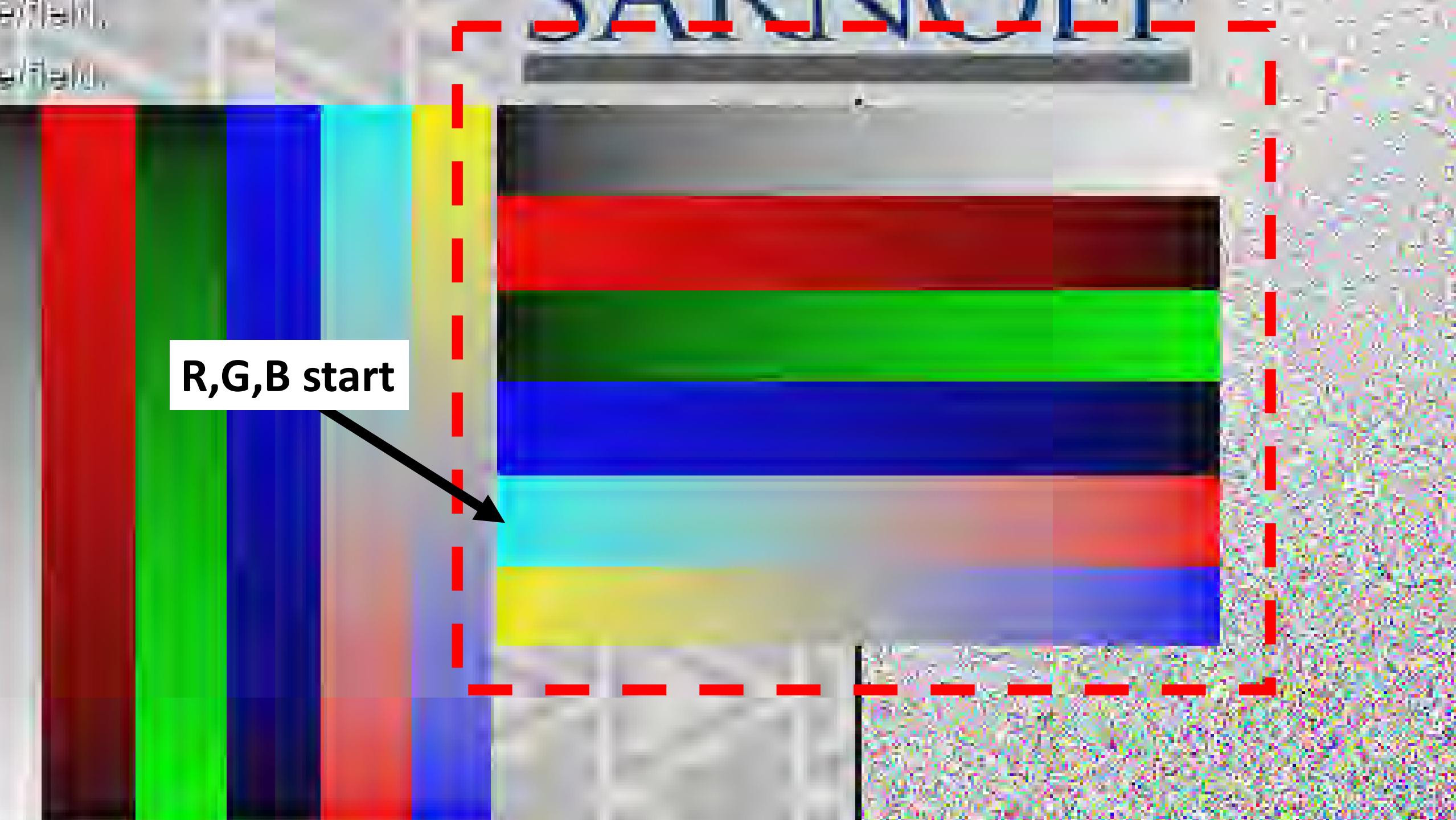
An old, old pattern: “Encoder Stress Pattern”

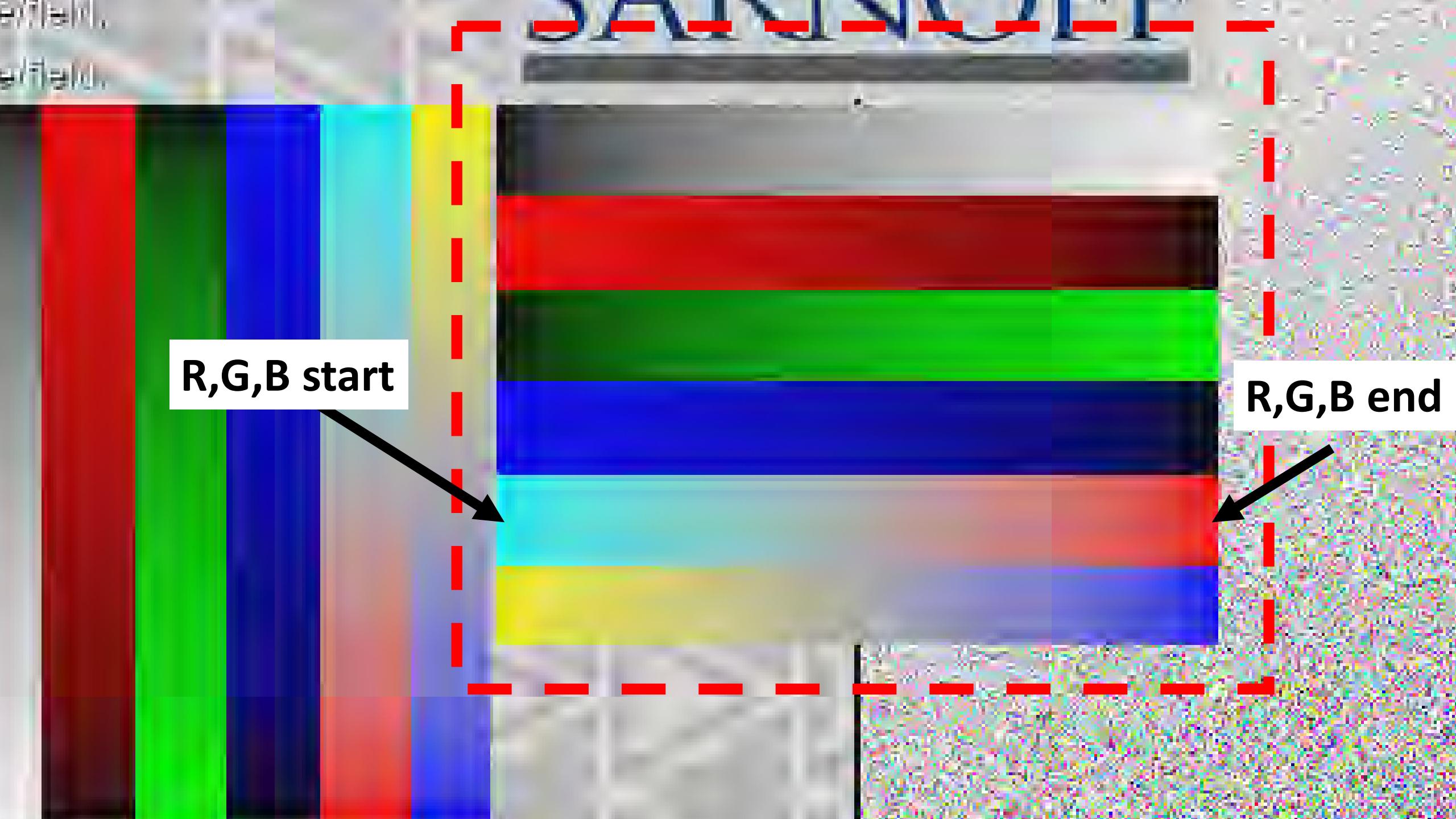


Sudden complexity change.

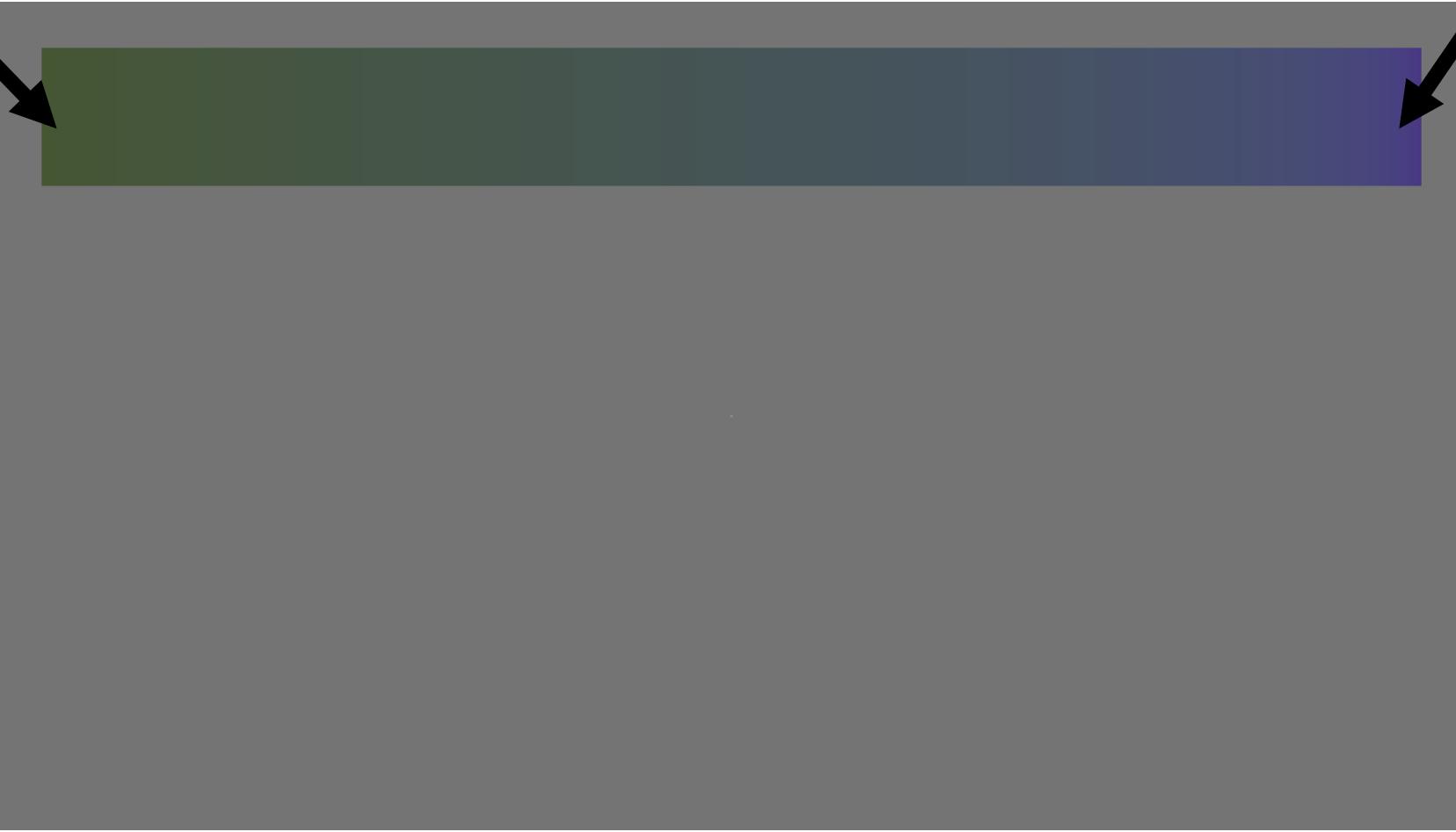








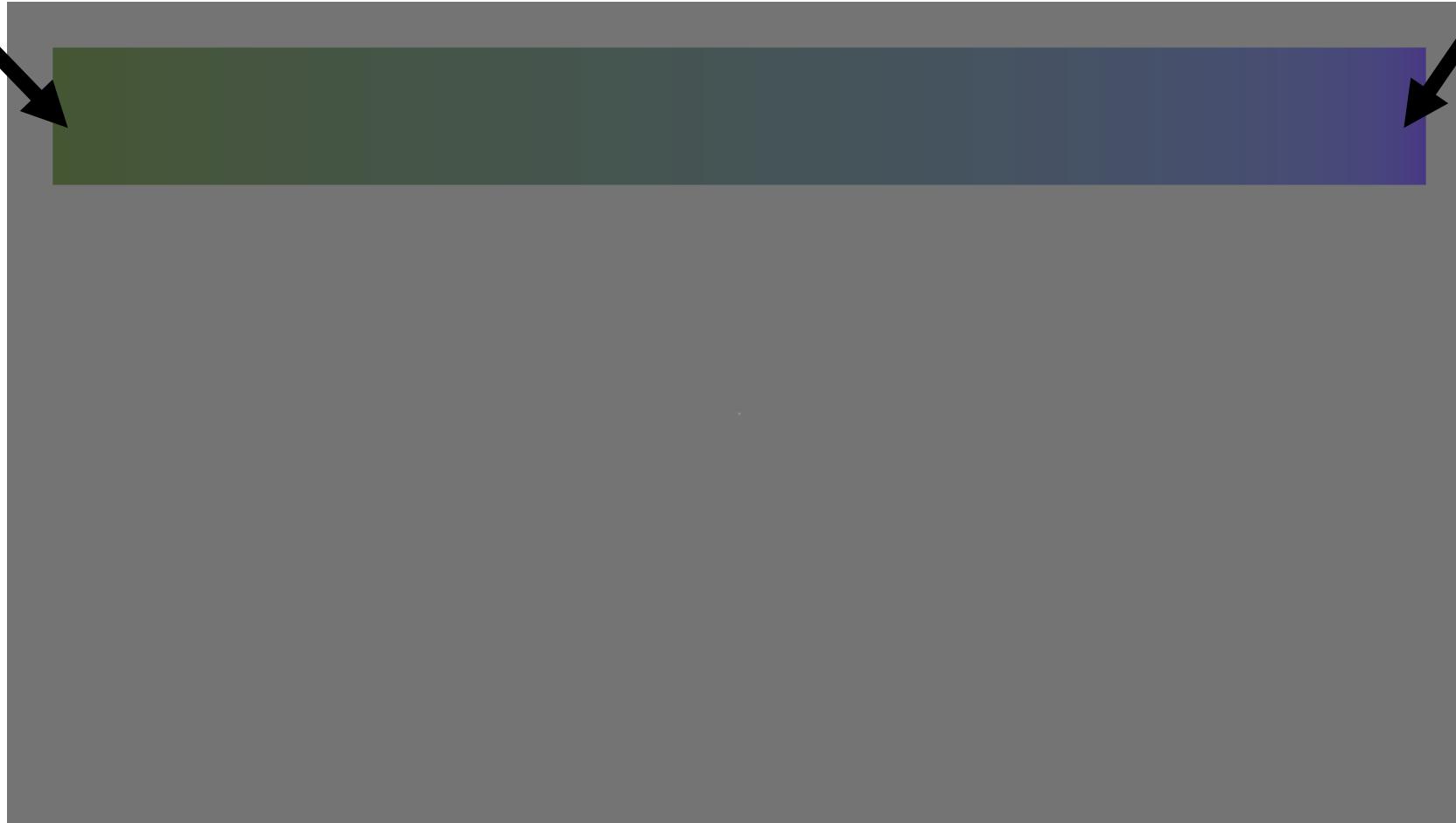
**x,y,Y start**



**x,y,Y end**

**x,y,Y start**

**709 G**



**x,y,Y end**

**709 B**

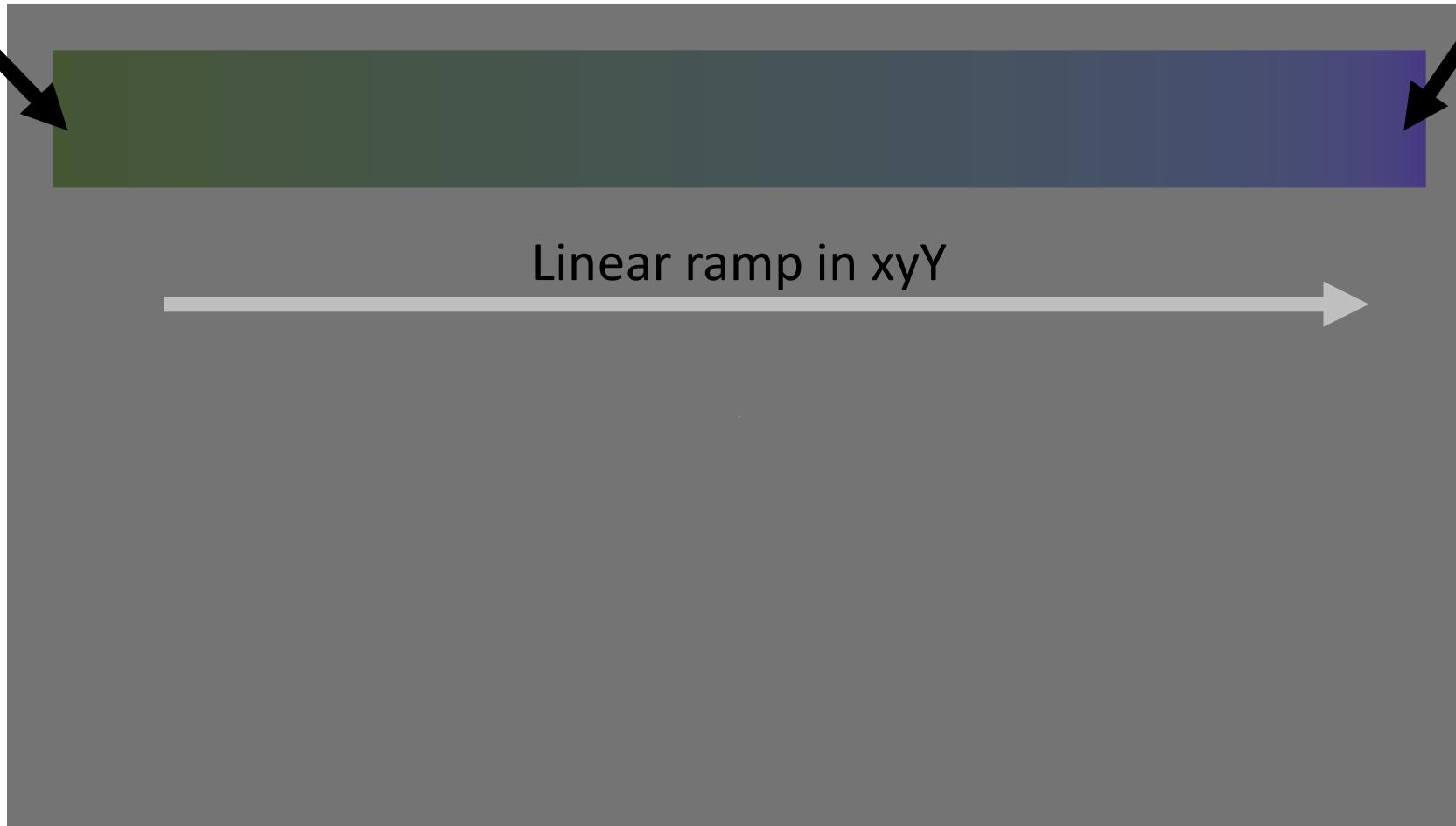
**x,y,Y start**

**709 G**

**x,y,Y end**

**709 B**

Linear ramp in xyY



**x,y,Y start**

**709 G**

**x,y,Y end**

**709 B**

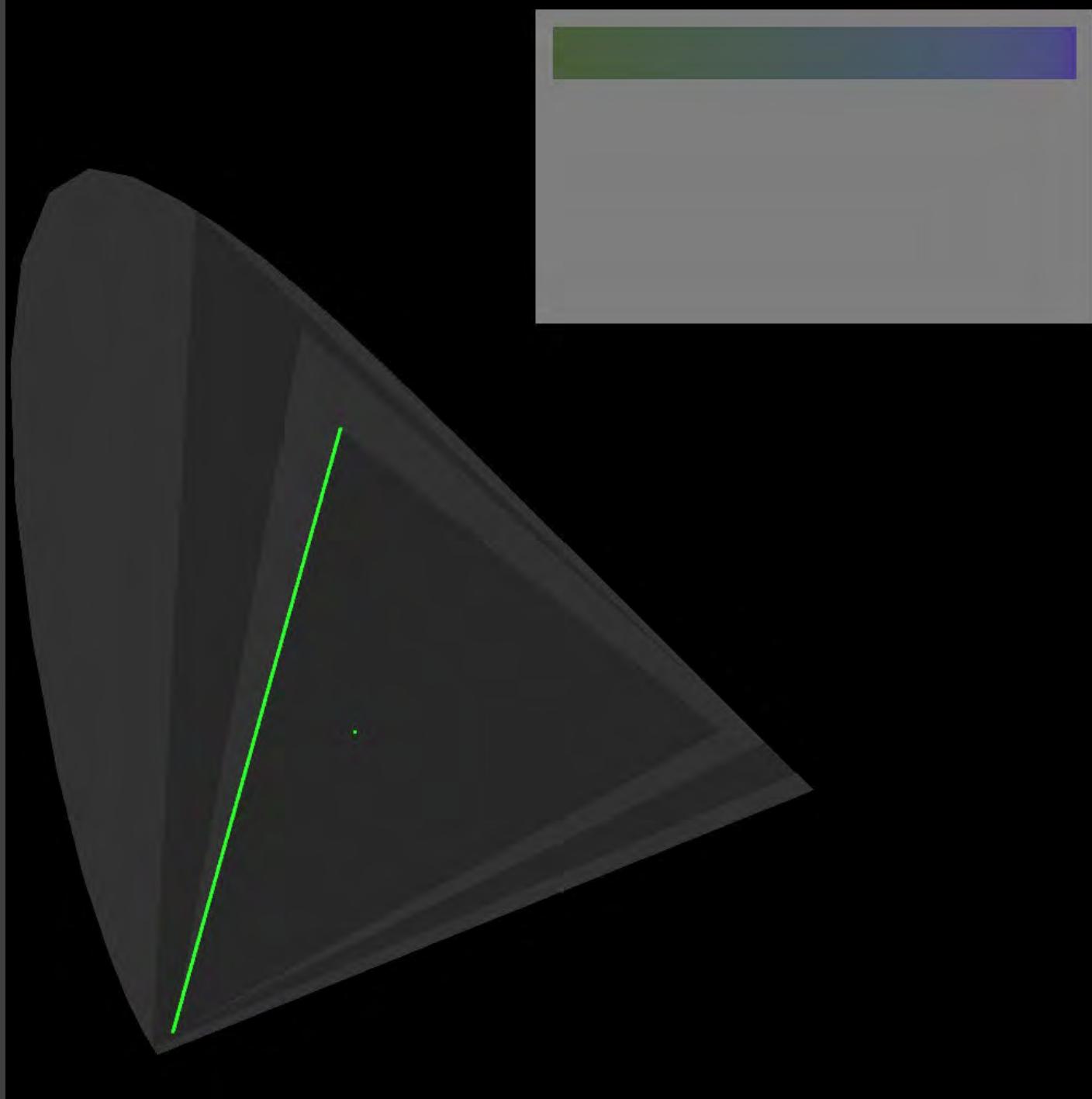
Linear ramp in xyY

**Evaluate on CIE x-y scope**

# G-to-B x-y ramp

These examples rendered in

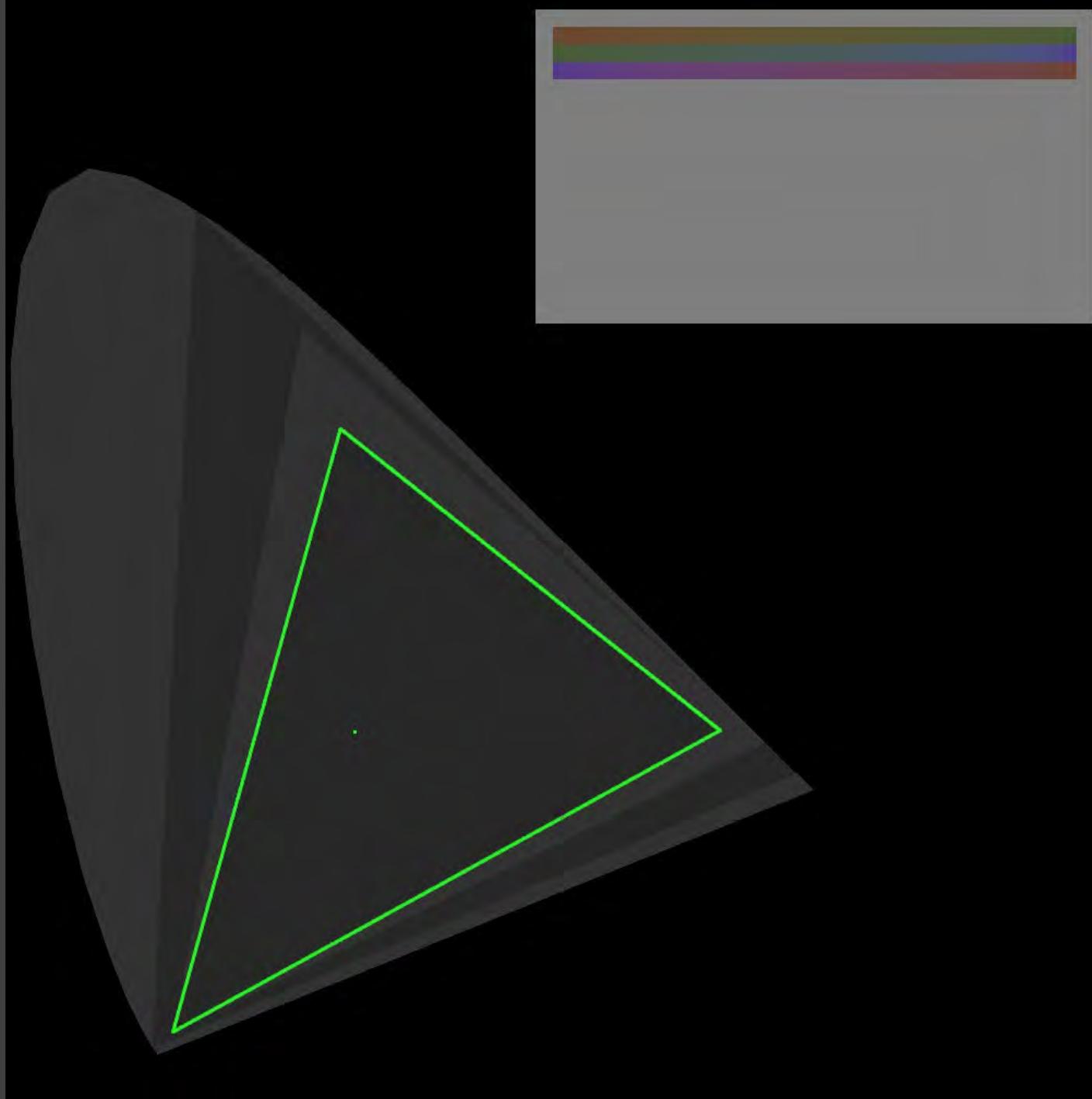
- 2020
- PQ
- Display referred
- Narrow range



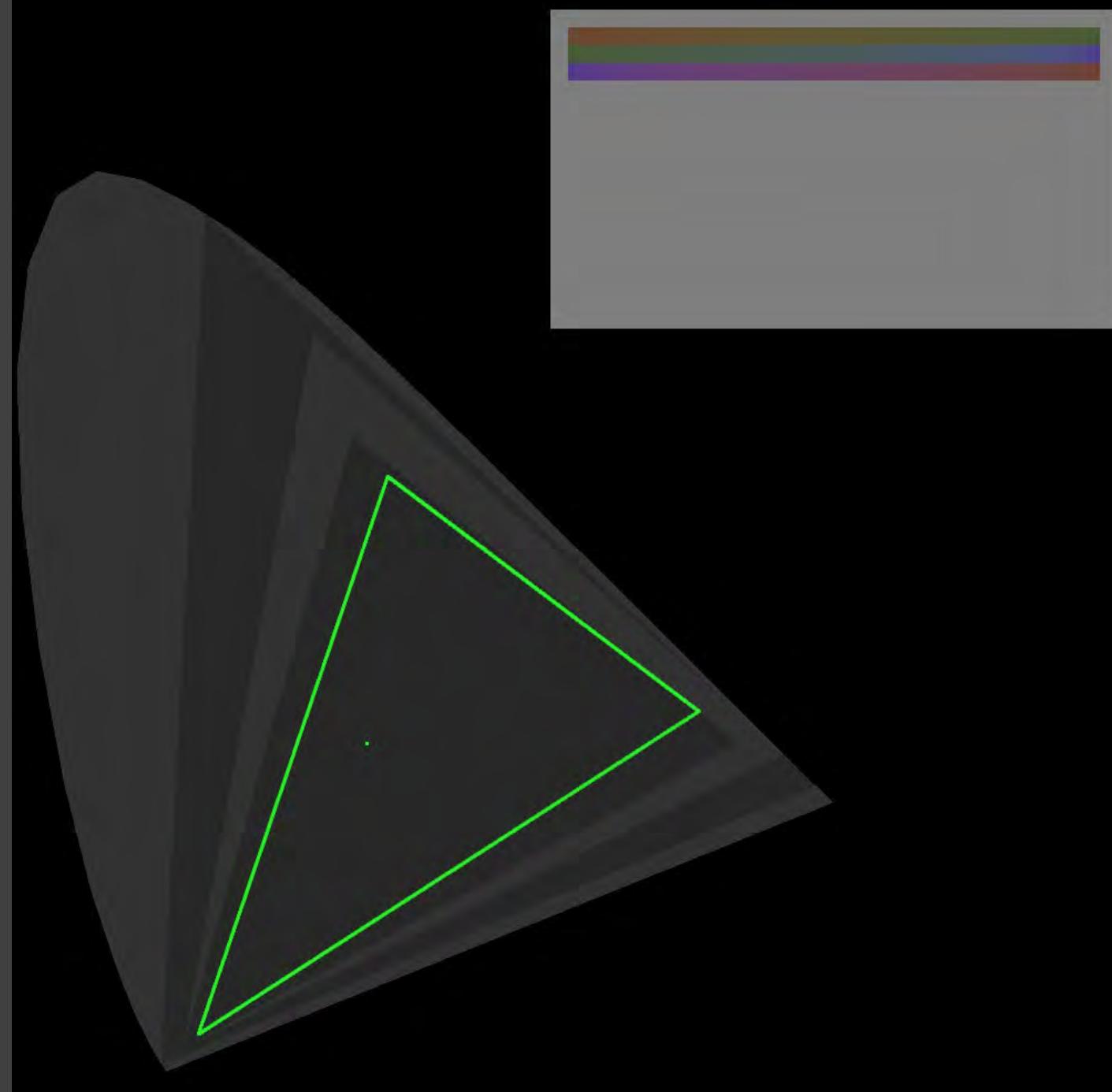
# 3 x-y ramps: 709 Gamut

These examples rendered in

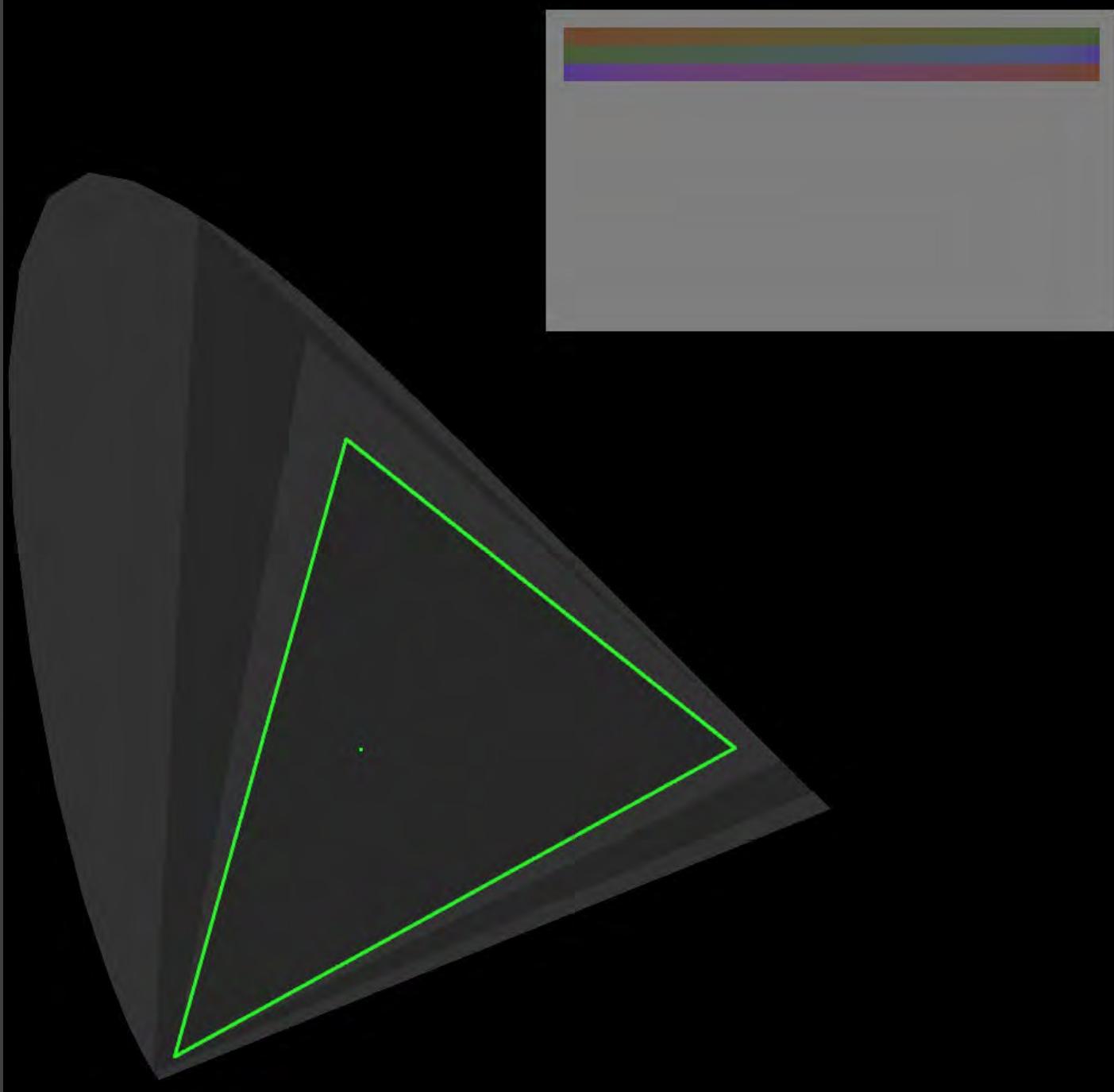
- 2020
- PQ
- Display referred
- Narrow range



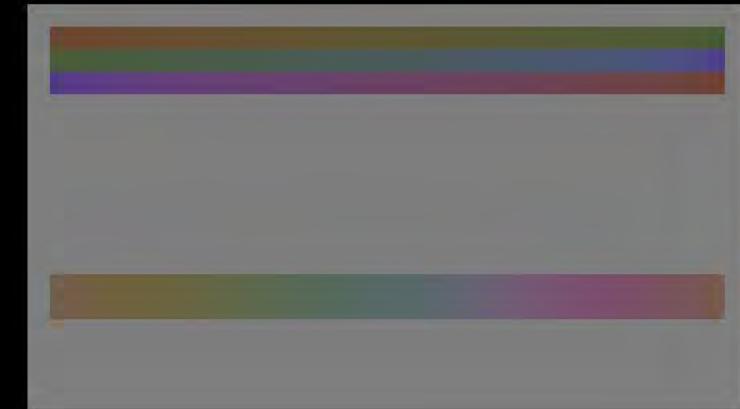
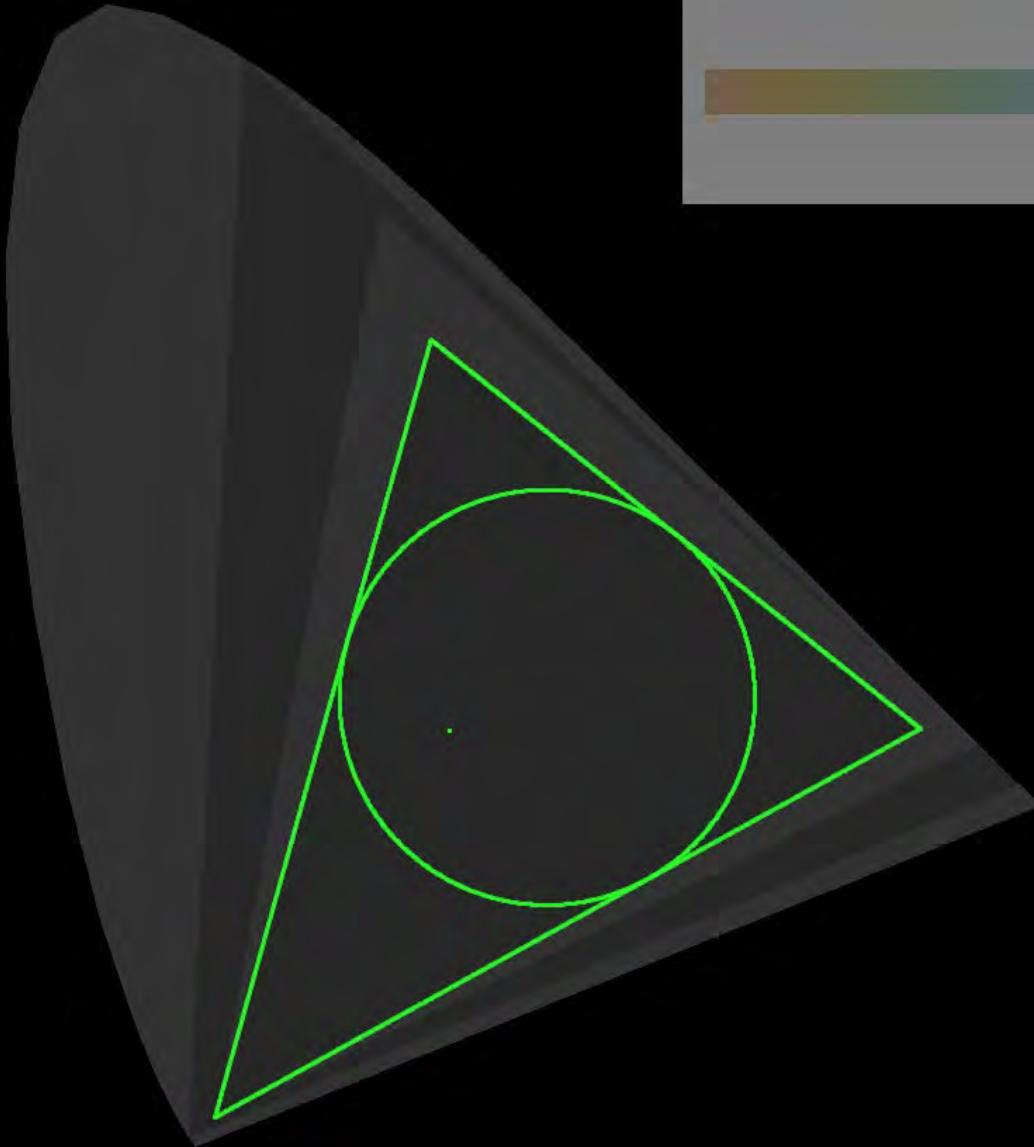
P3D65, not 2020



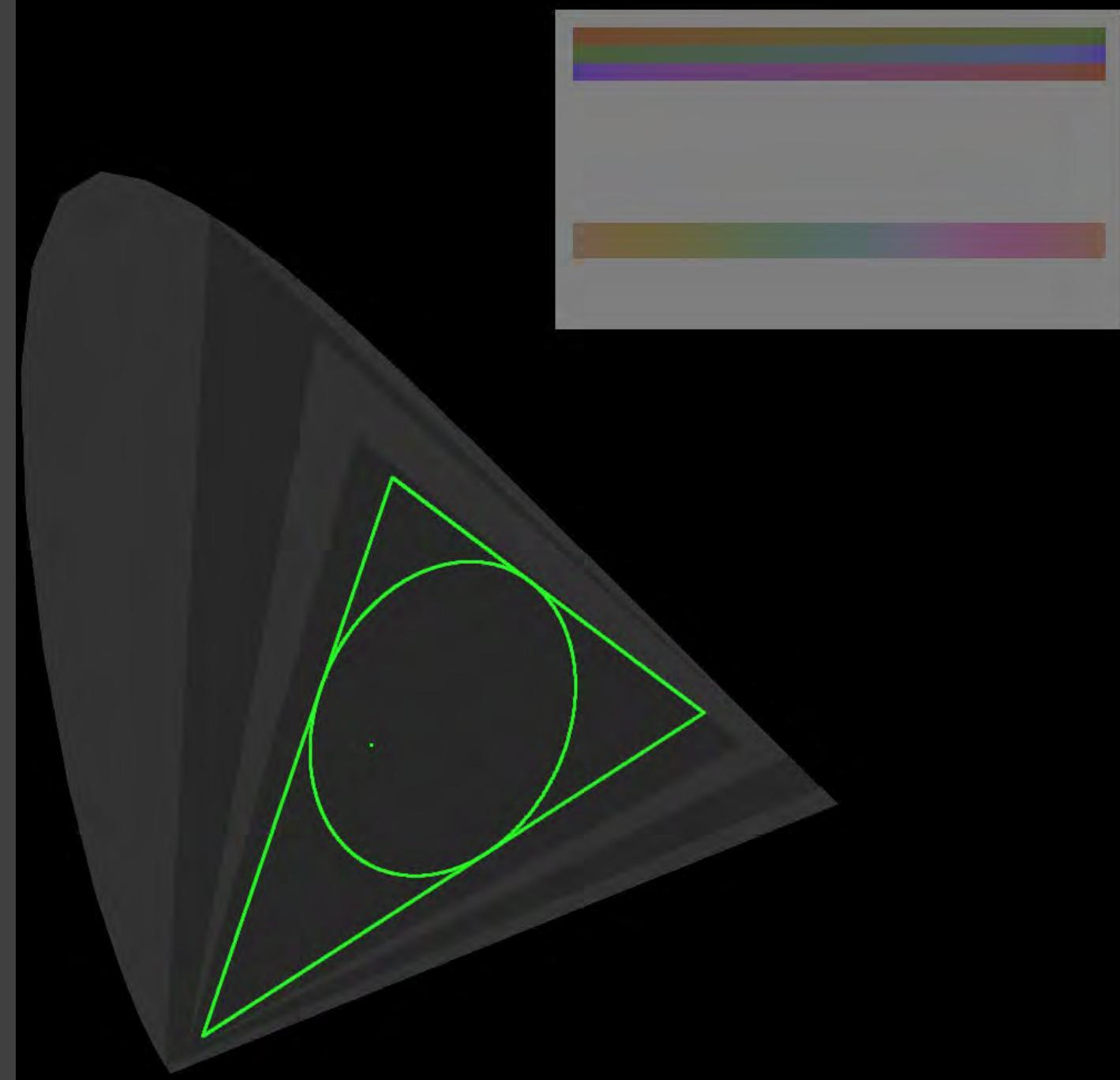
# 3 x-y ramps: 709 Gamut



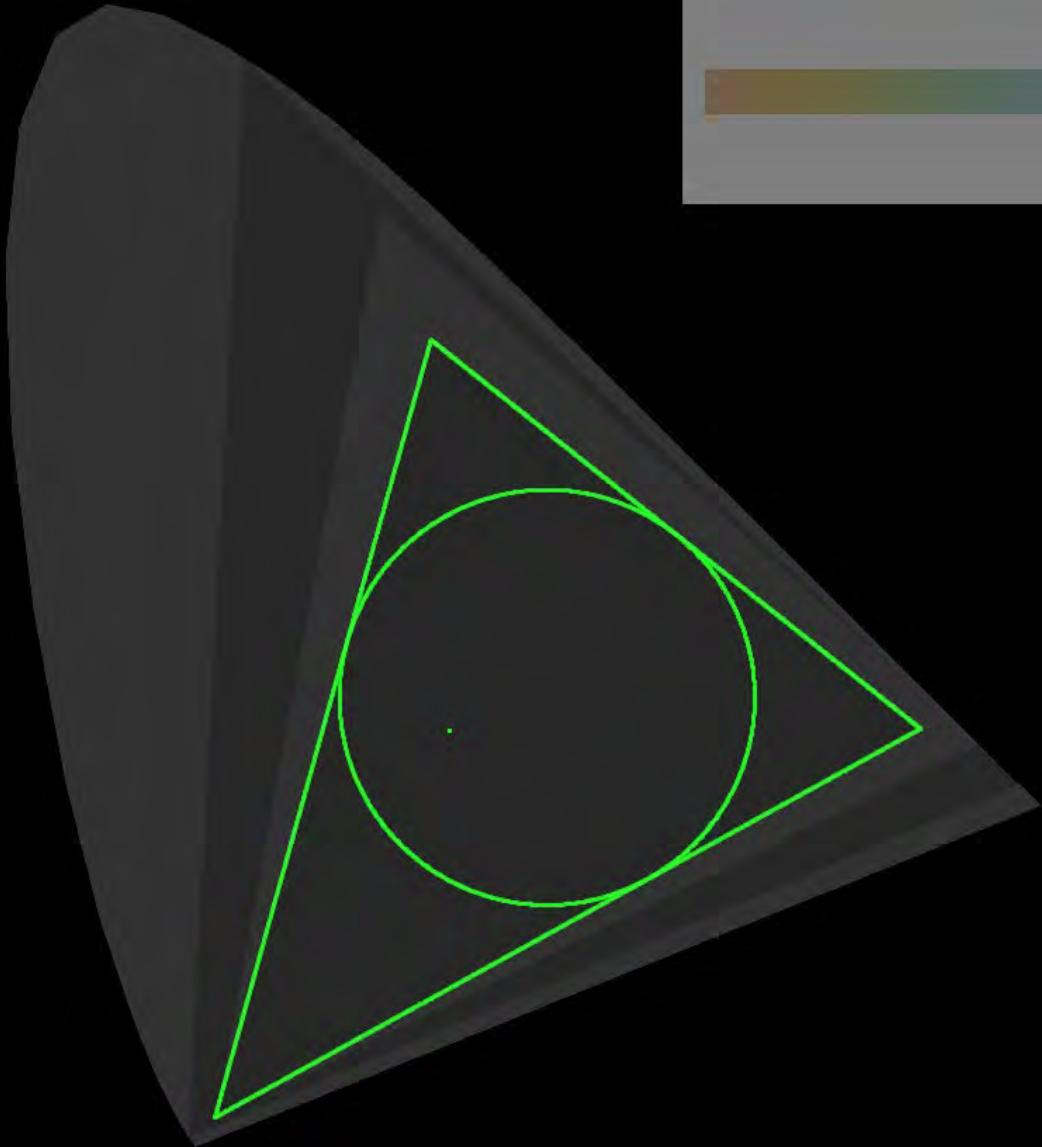
# Inscribed Circle



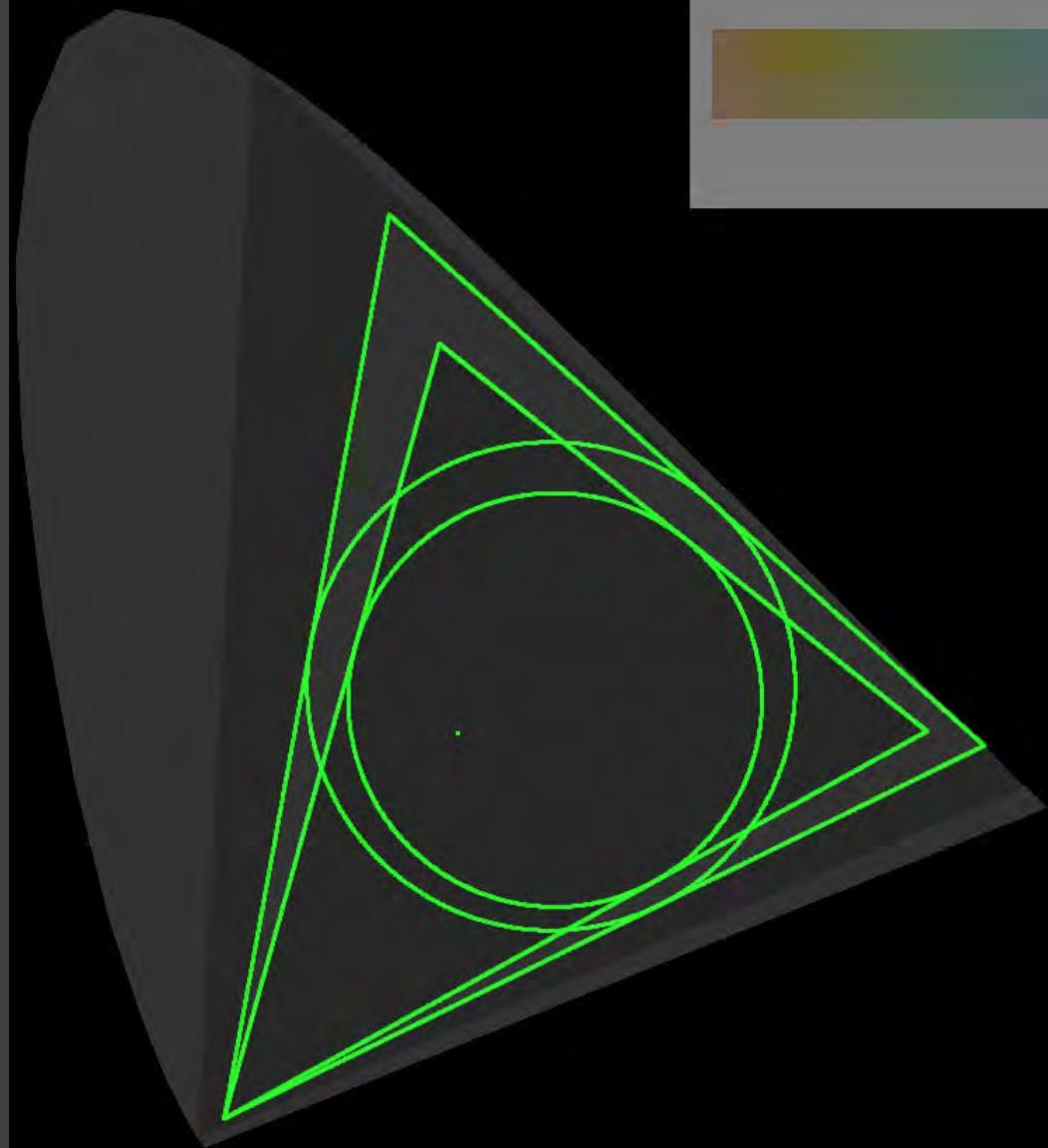
P3D65, not 2020



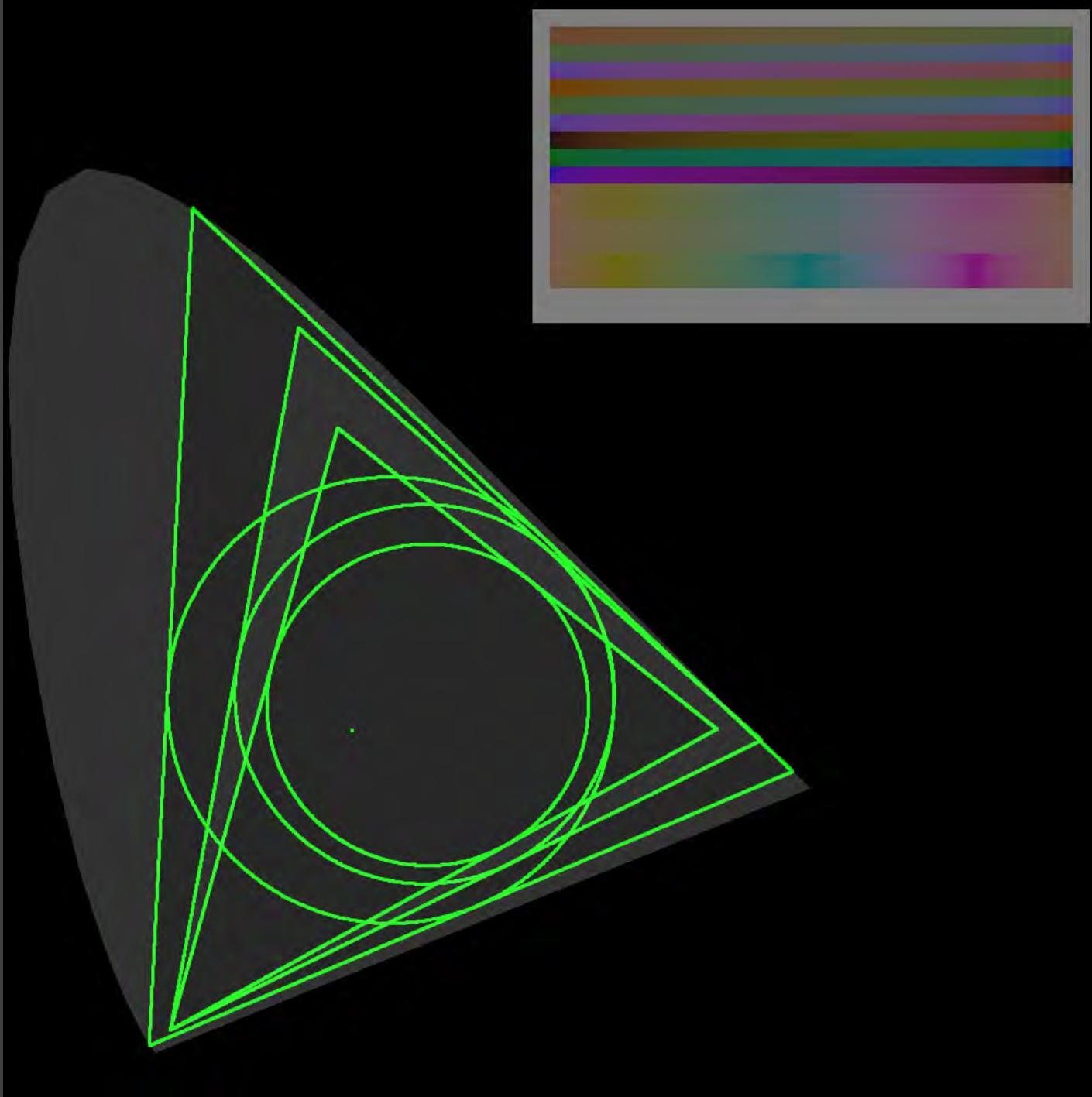
# Inscribed Circle



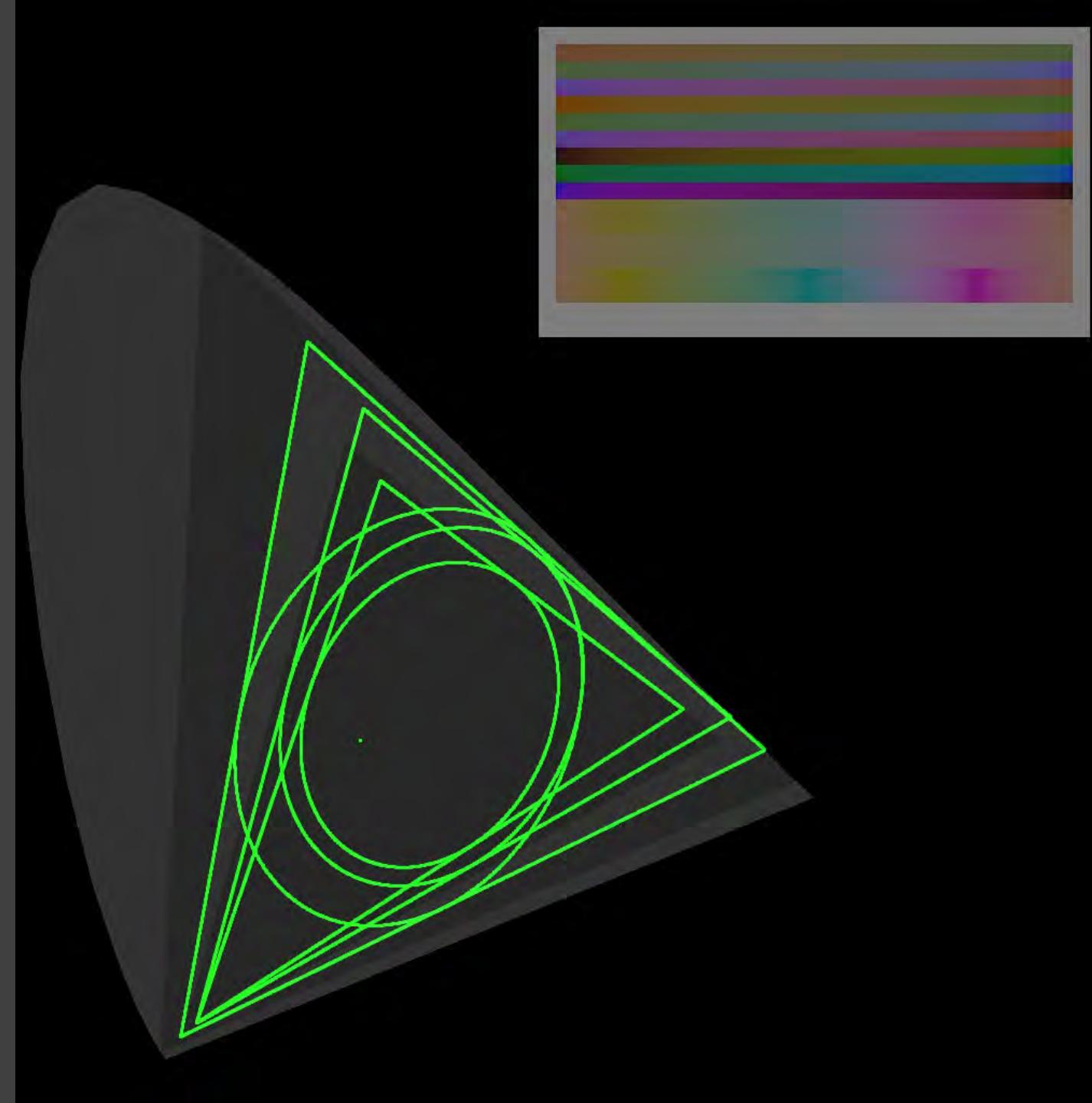
709, P3



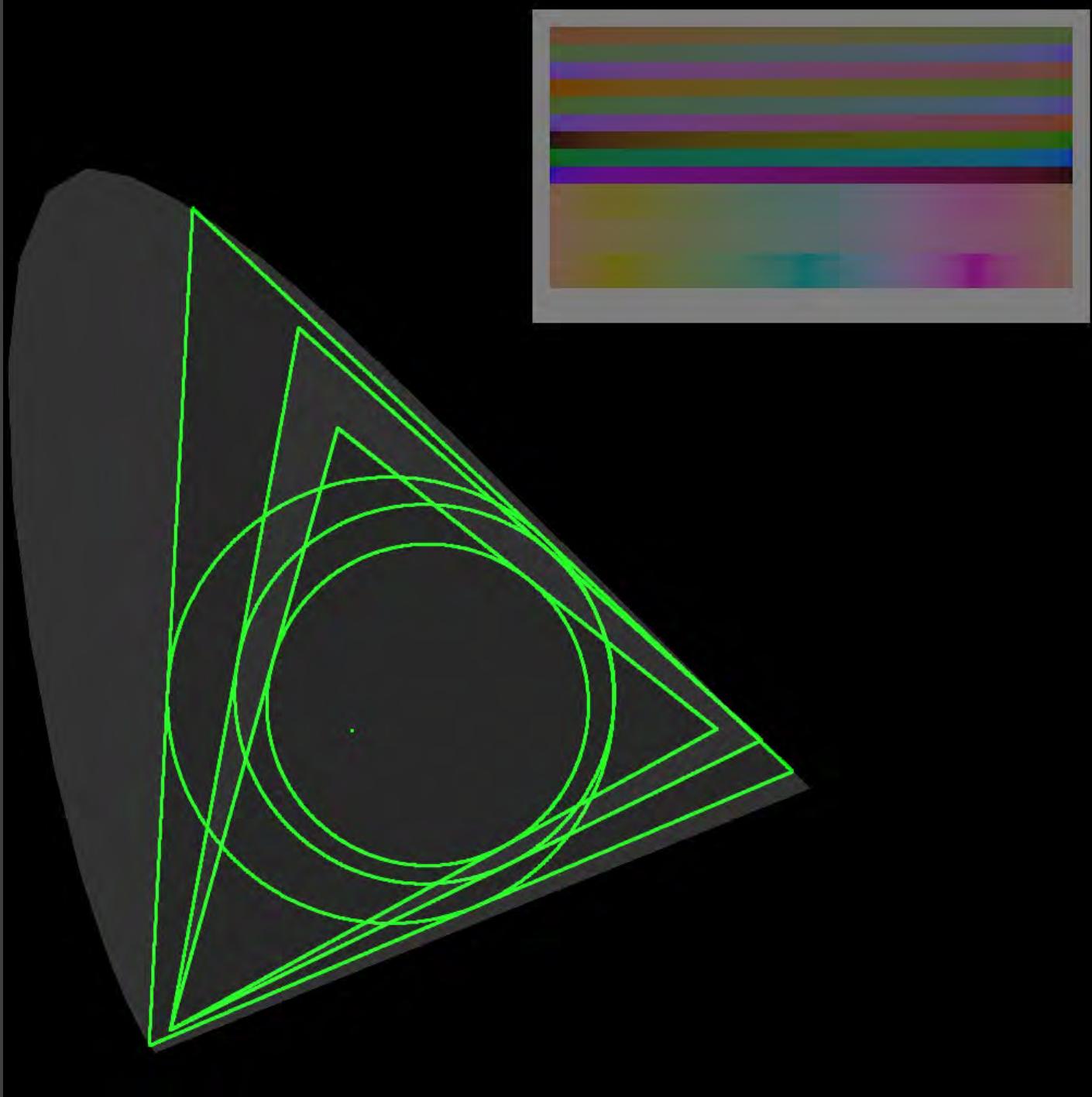
709, P3, 2020



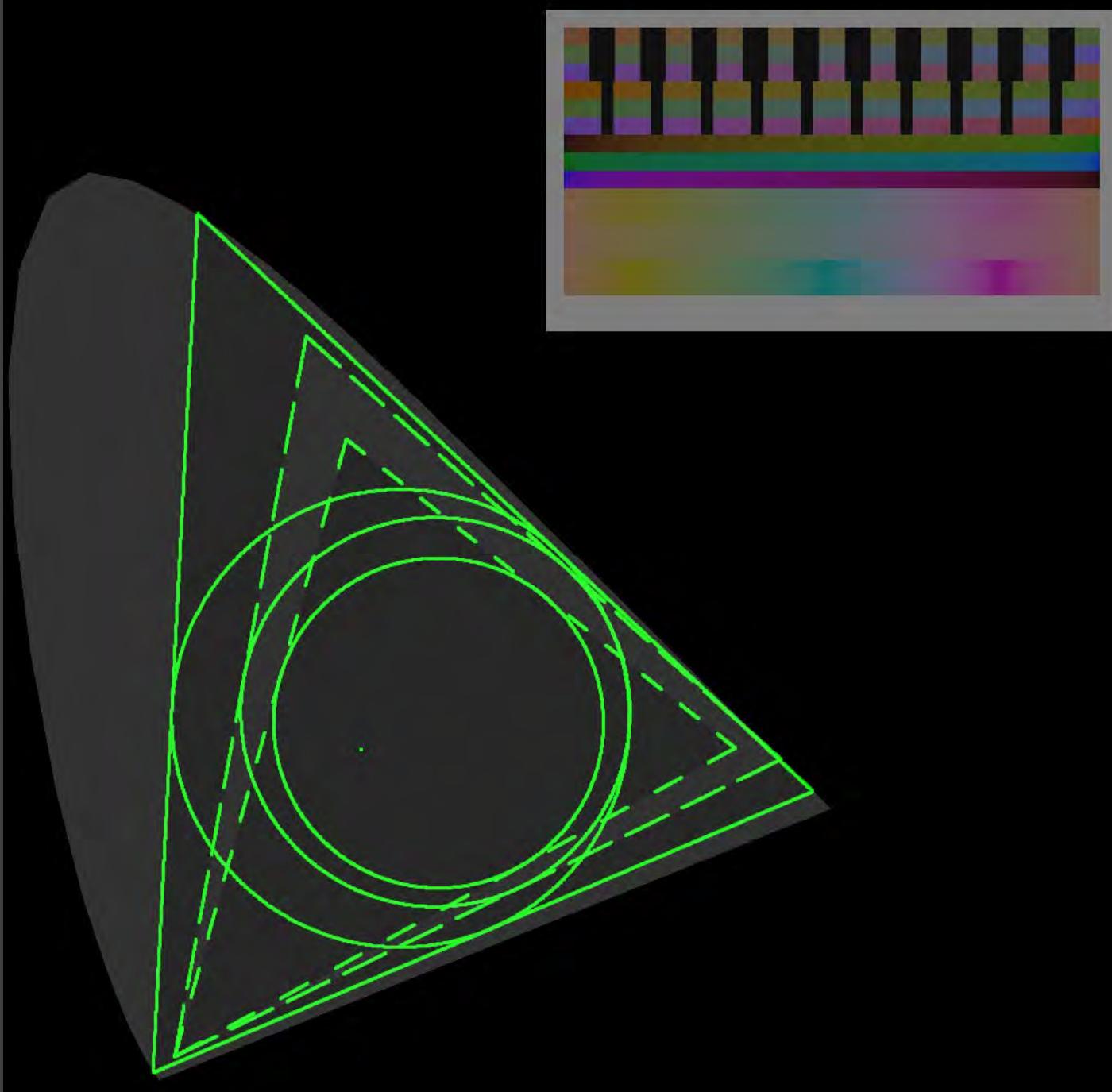
P3D65, not 2020



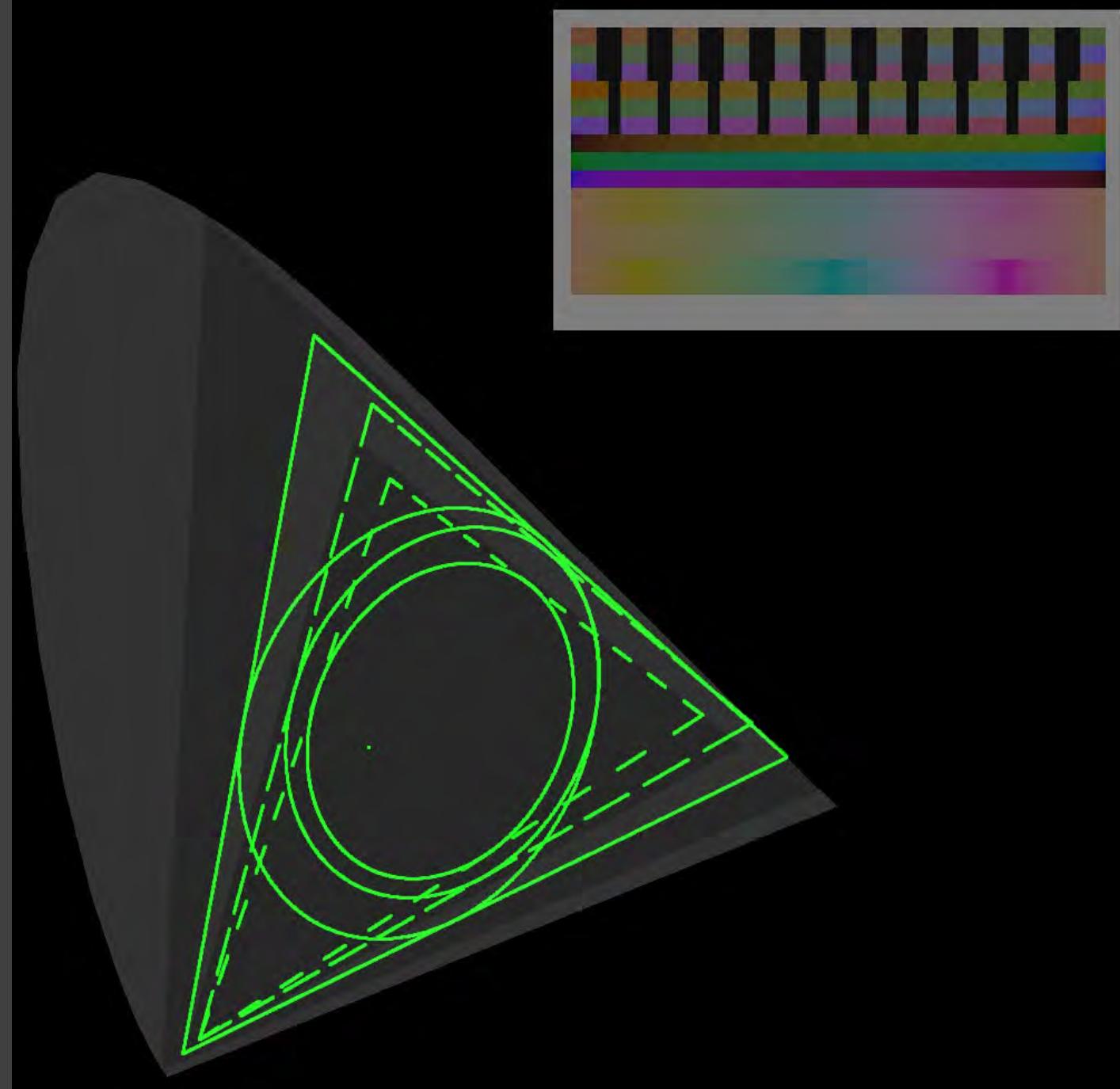
709, P3, 2020



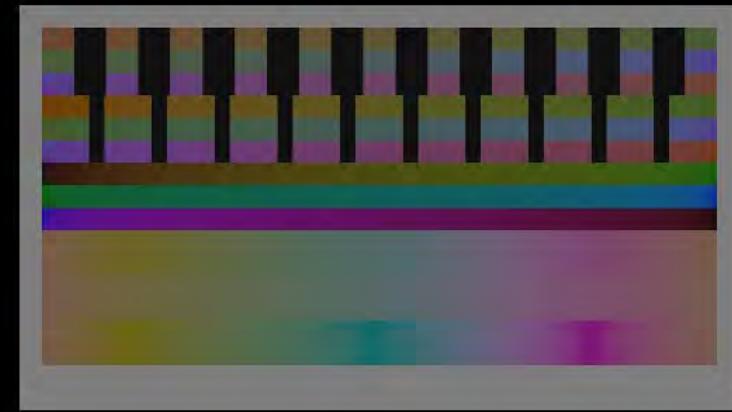
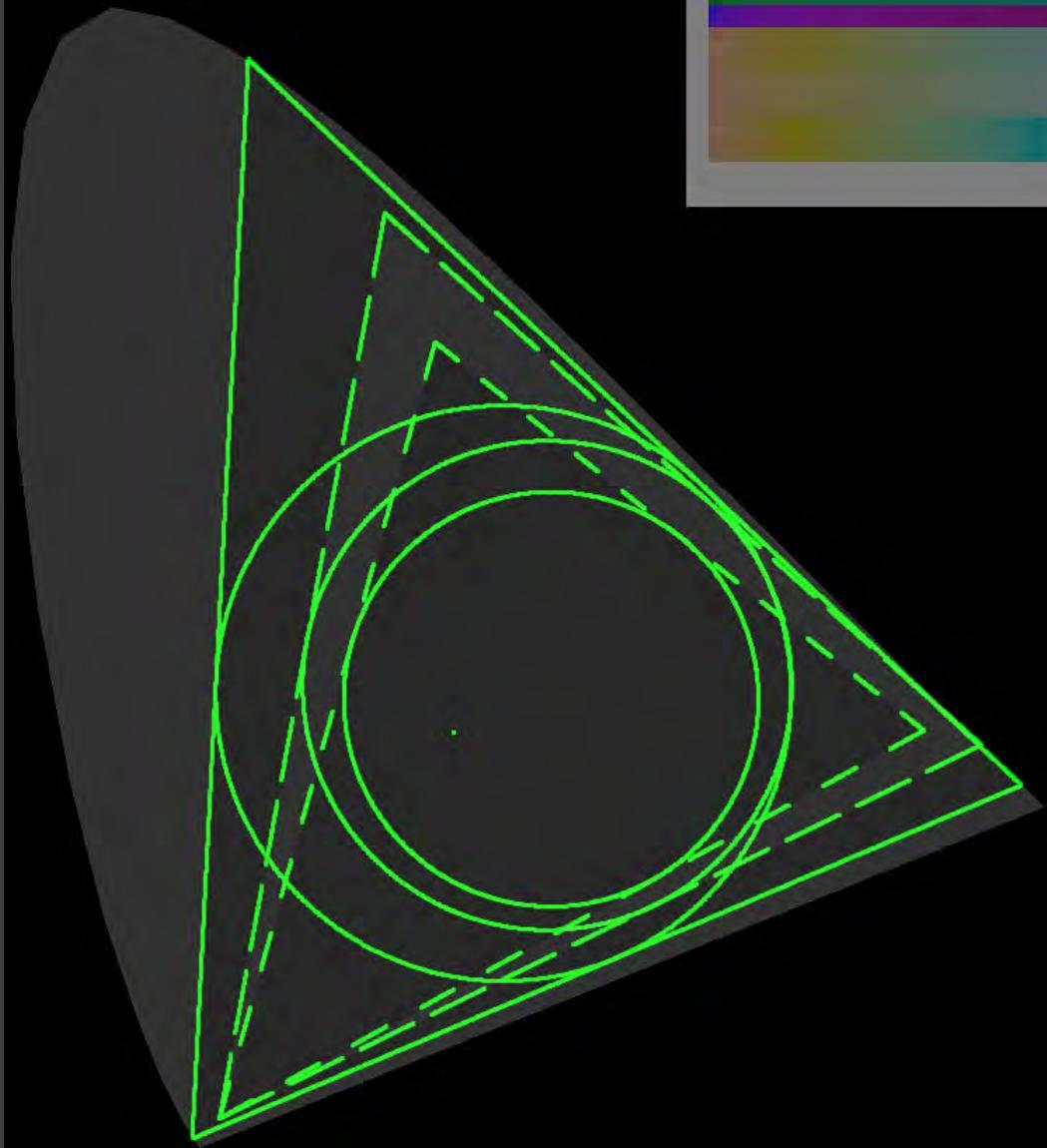
709, P3, 2020 w/ dashing



709, P3, 2020 w/ dashing

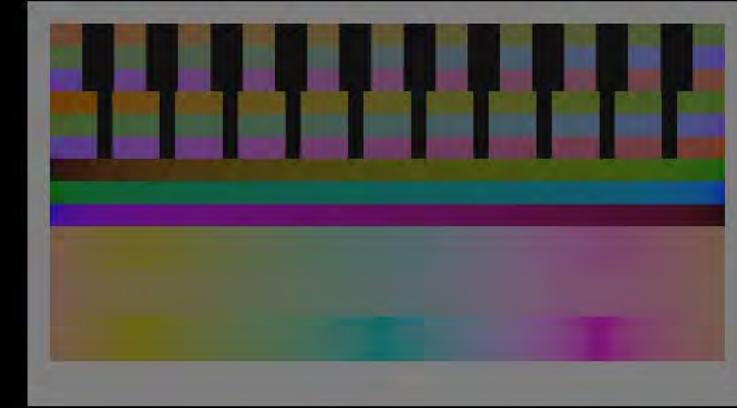
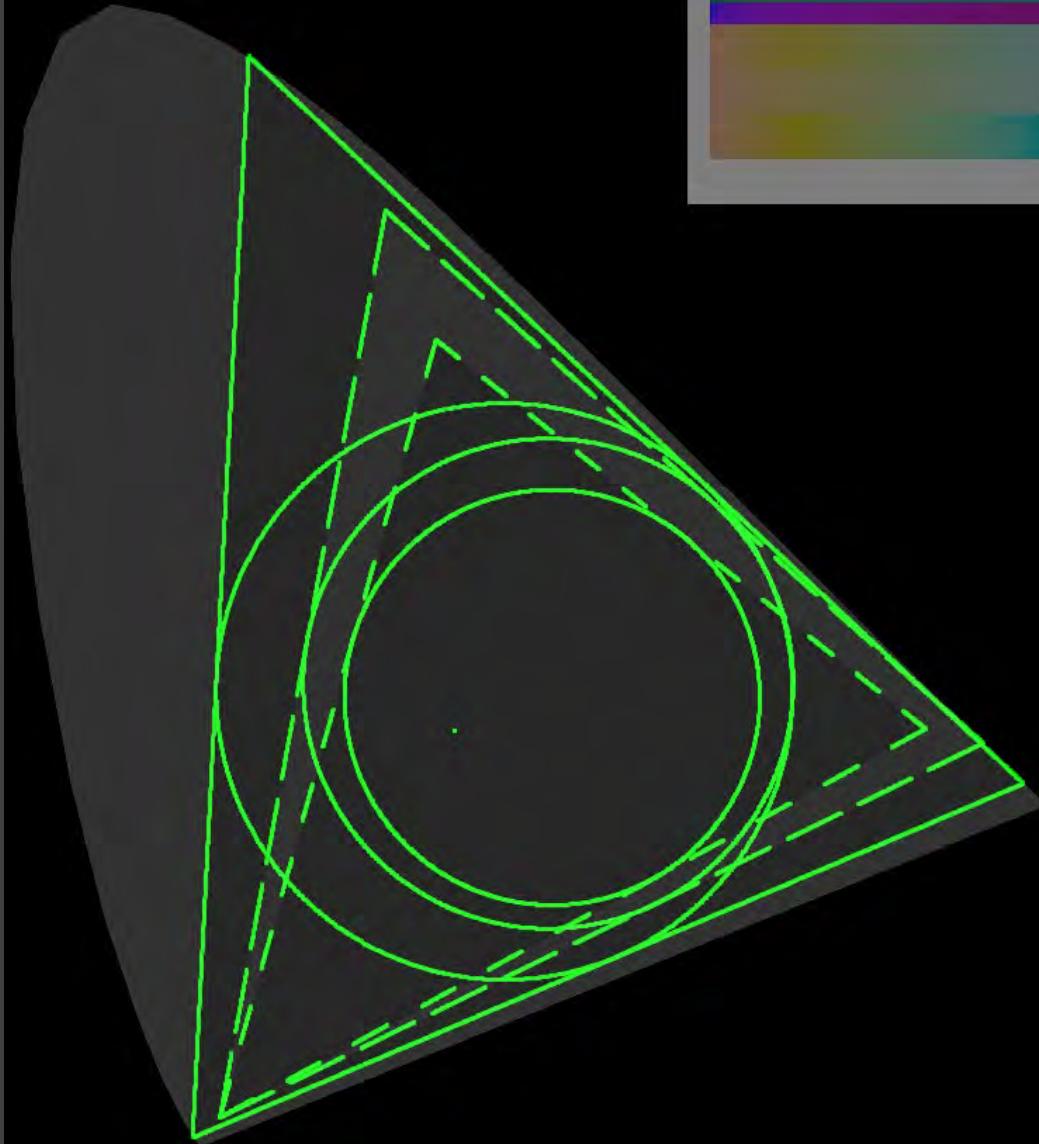


# “Gamut Circles”

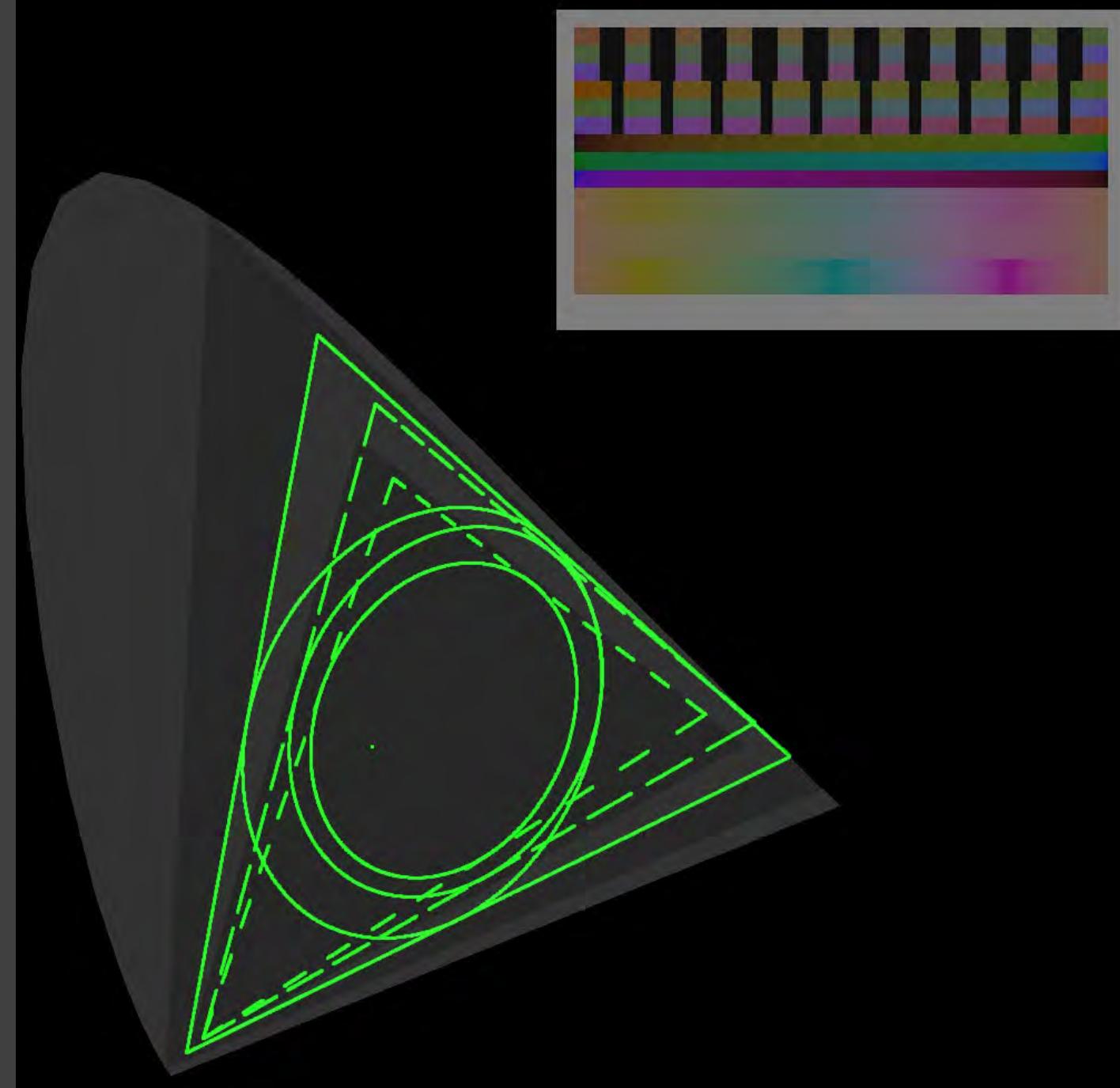


# Examples

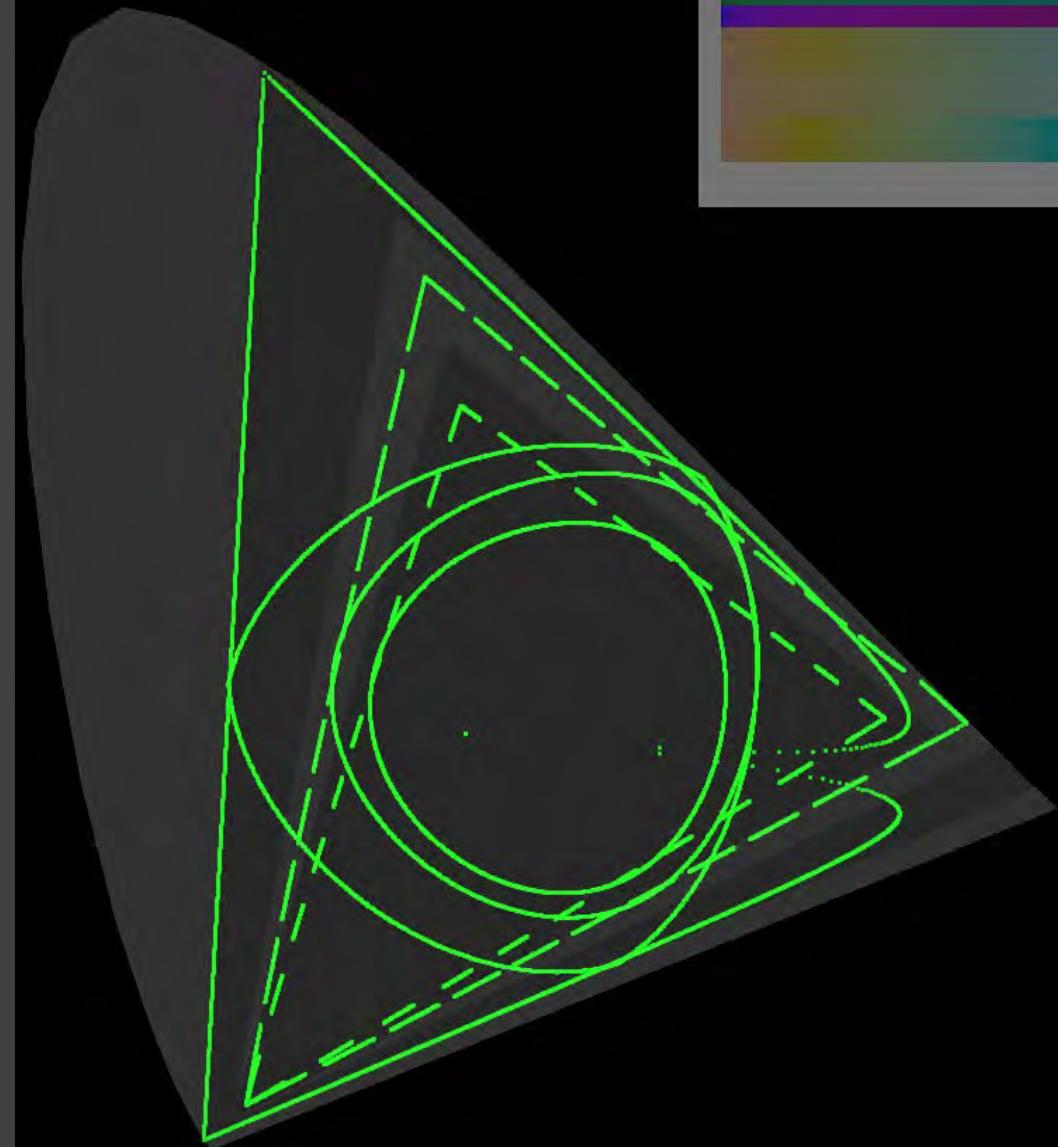
“Gamut Circles”



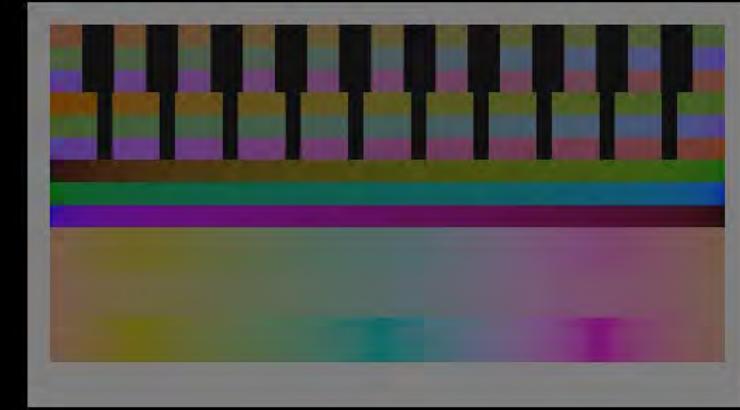
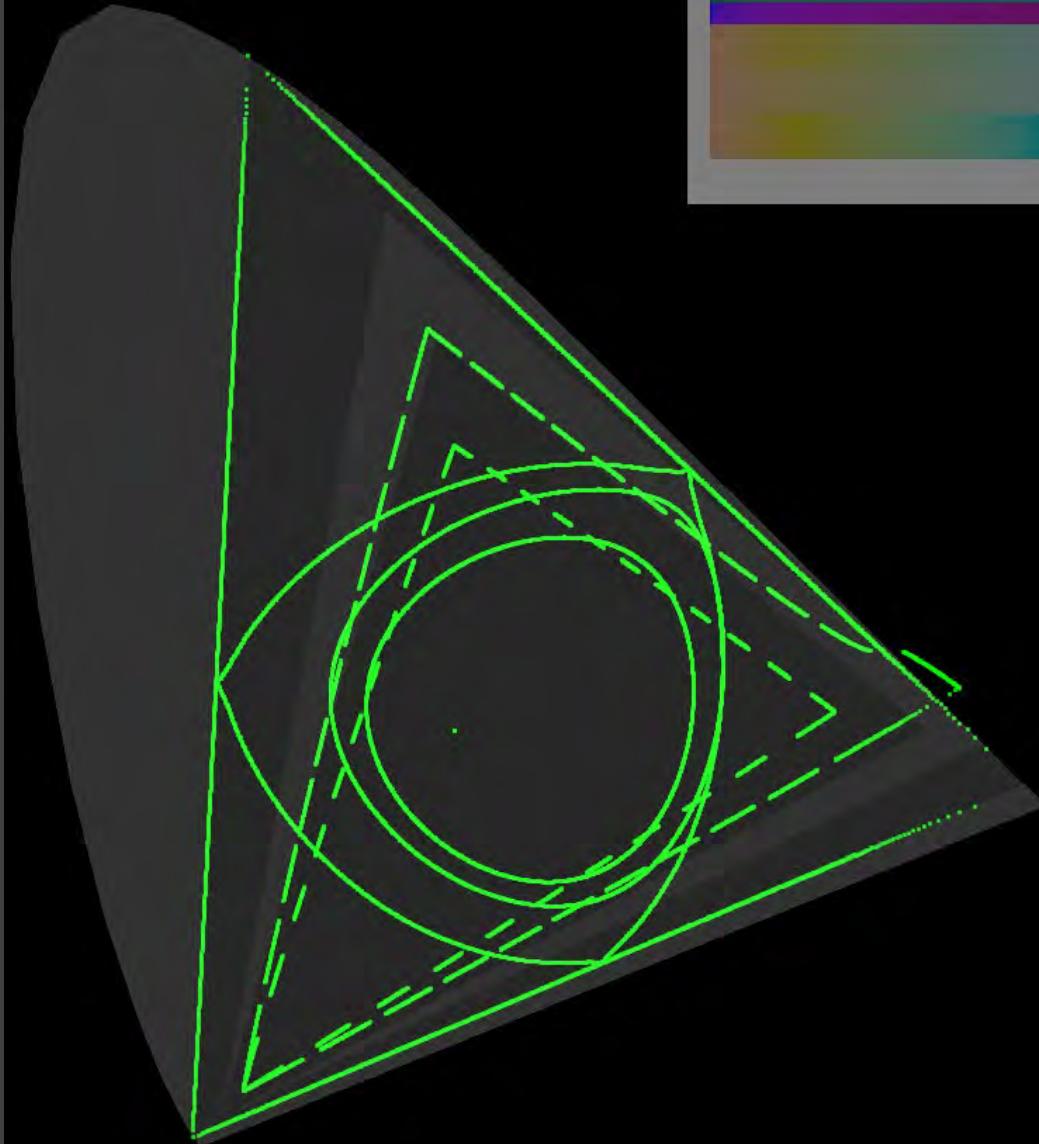
P3D65, not 2020



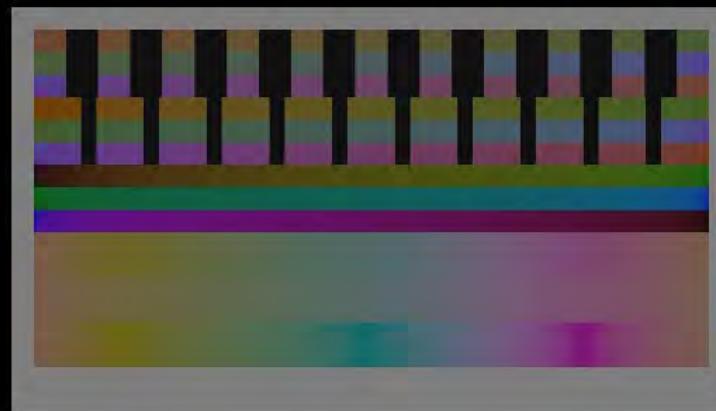
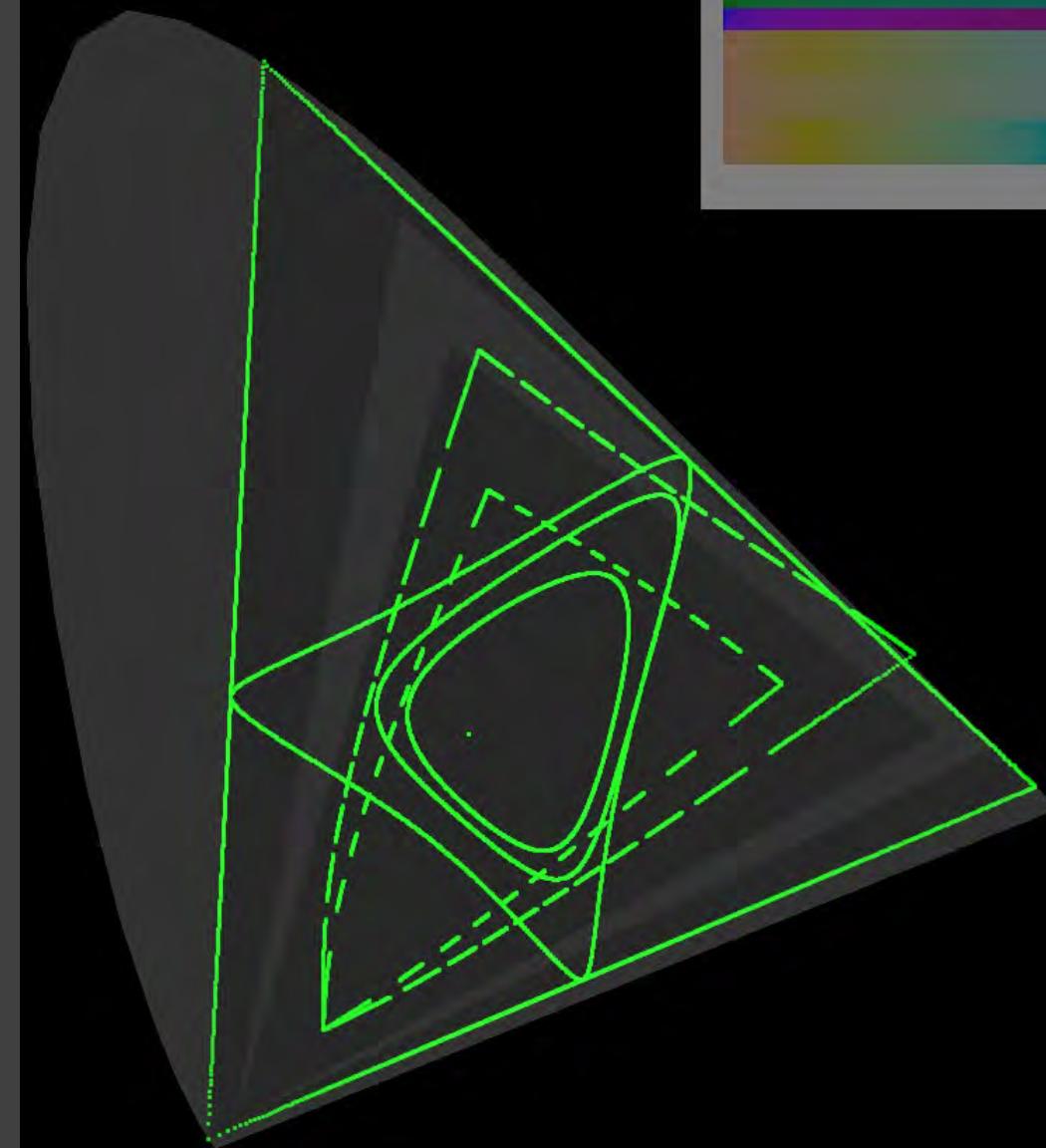
Full, not narrow range



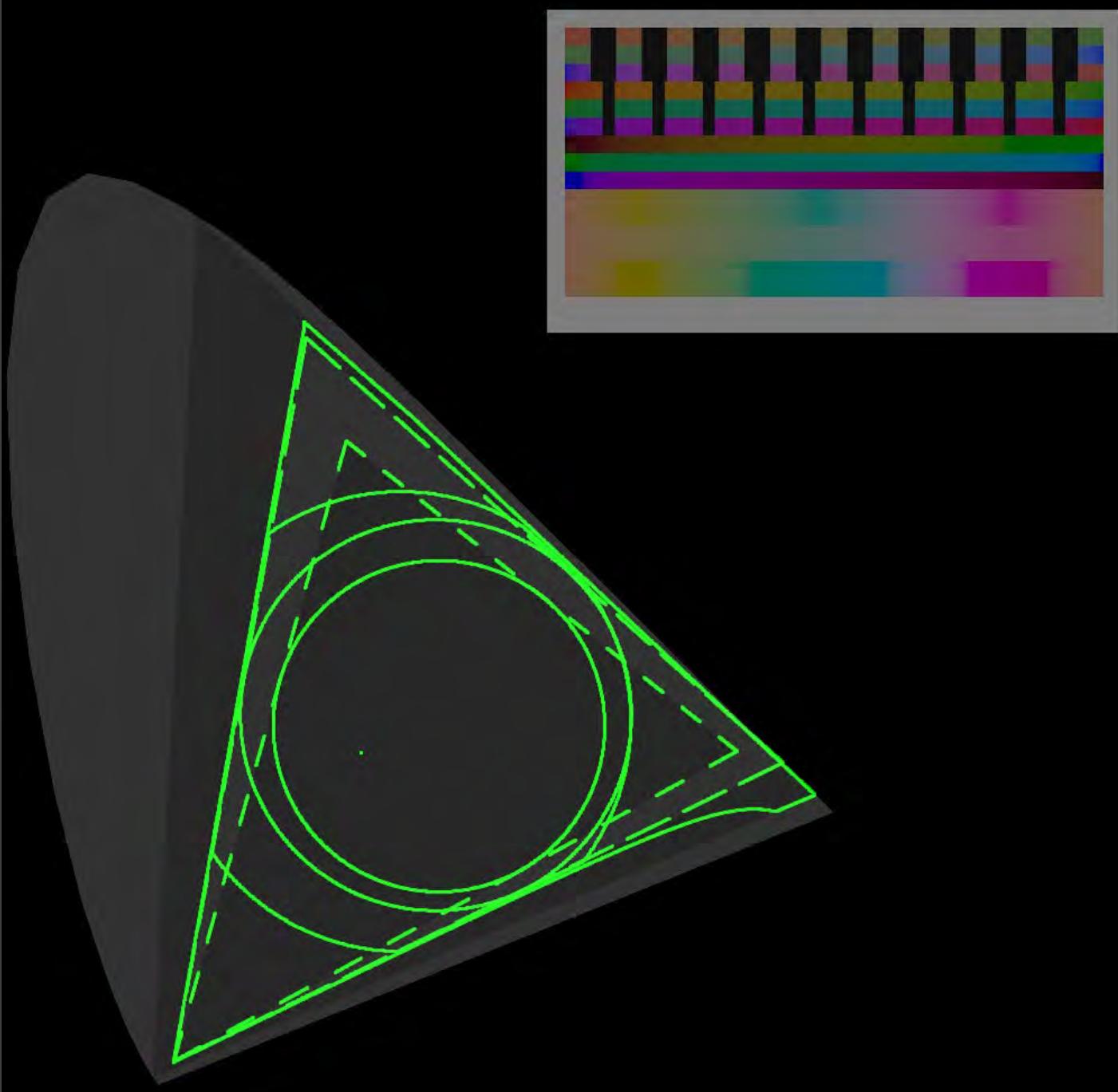
Scene, not display referred



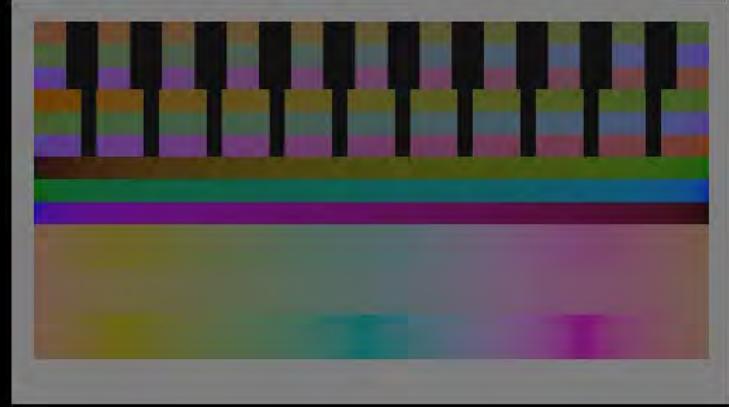
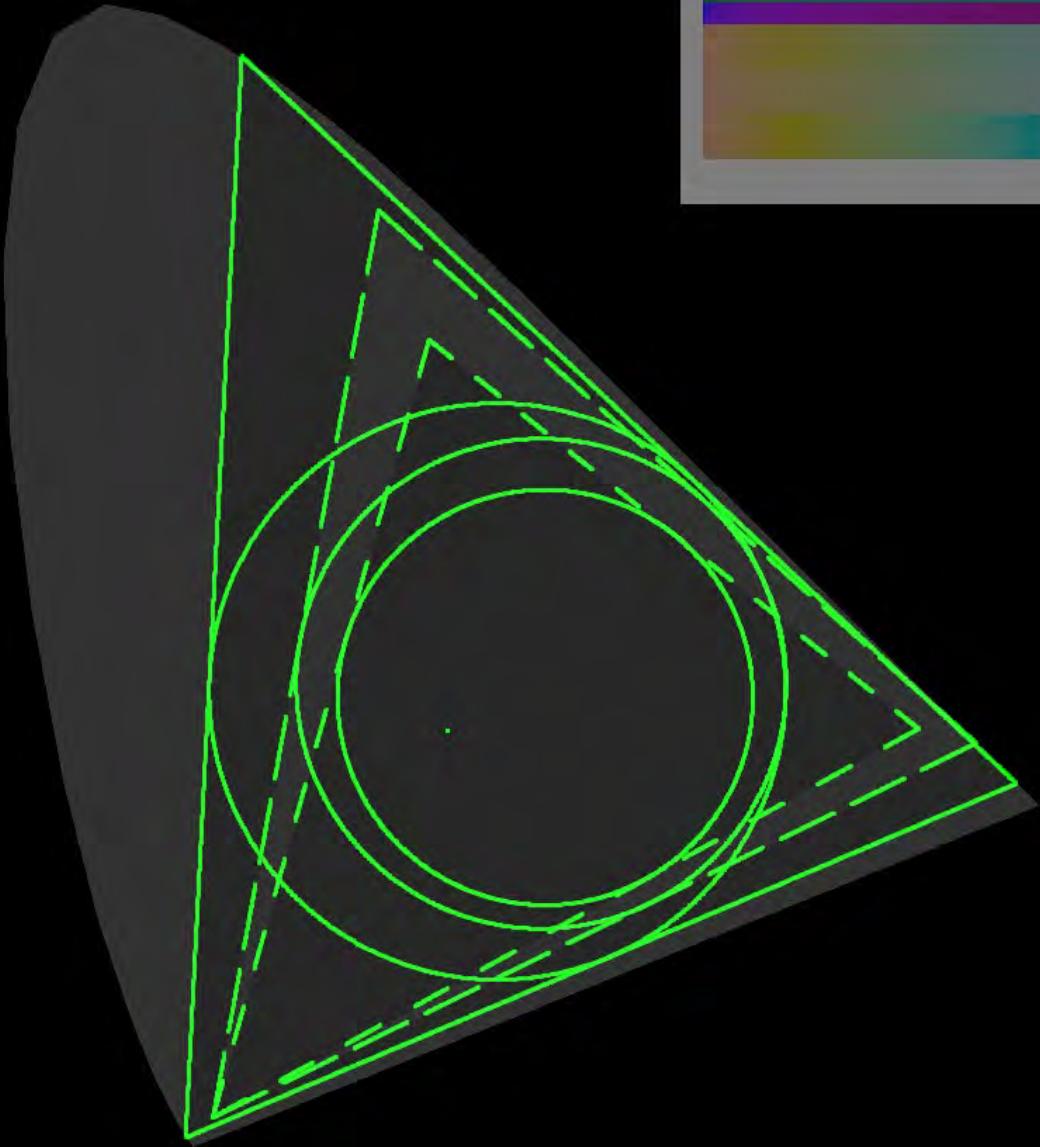
**HLG not PQ**



2020 -> P3



# “Gamut Circles”



Pattern 2 of 2

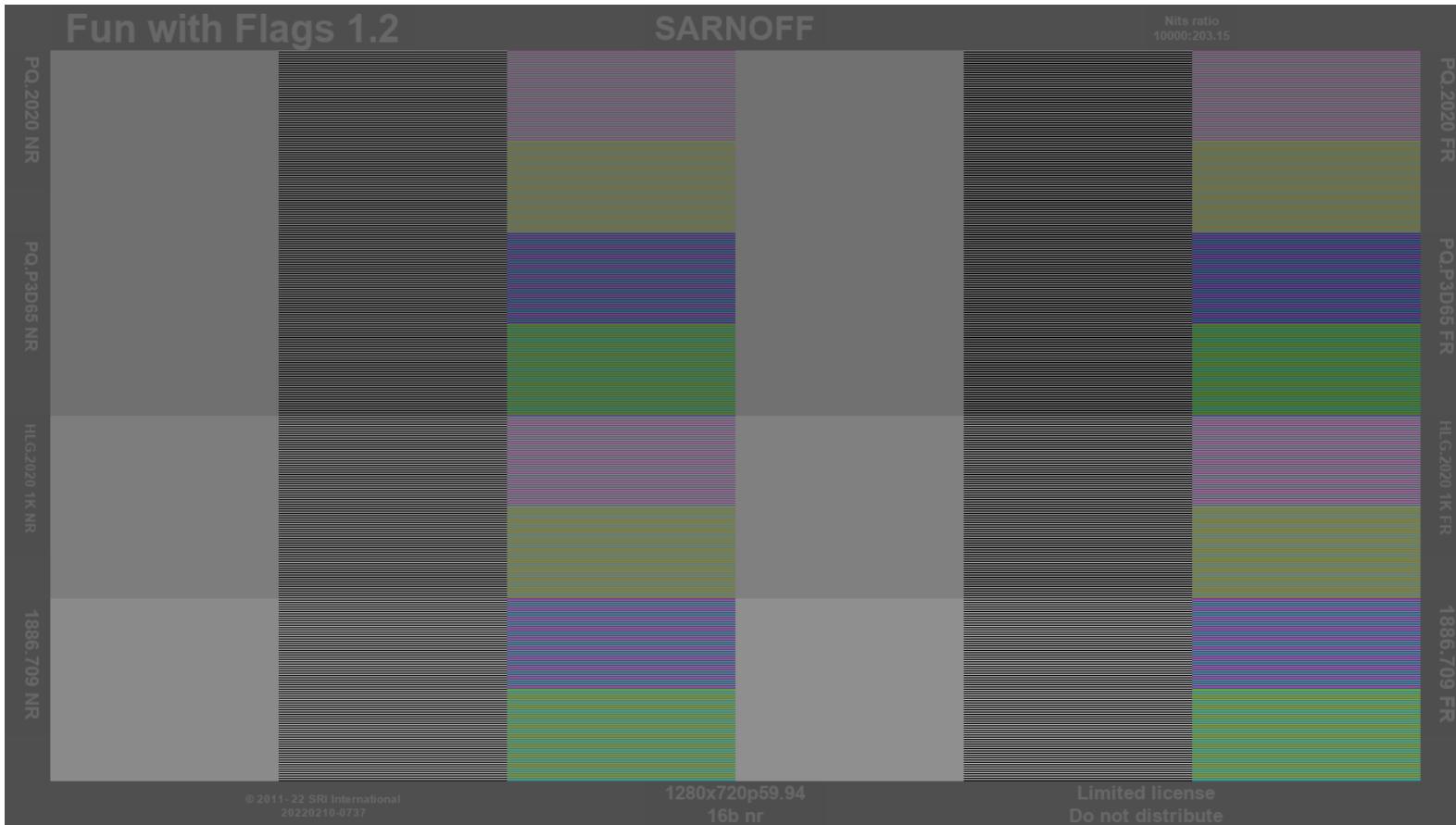
- Harvey Landy (Universal)
- Grading session on Ref Monitor
- Monitor supports MANY formats
- **Is it set to the one I need?**
- 30+ mins for engineer to verify
- Could a pattern make this faster?



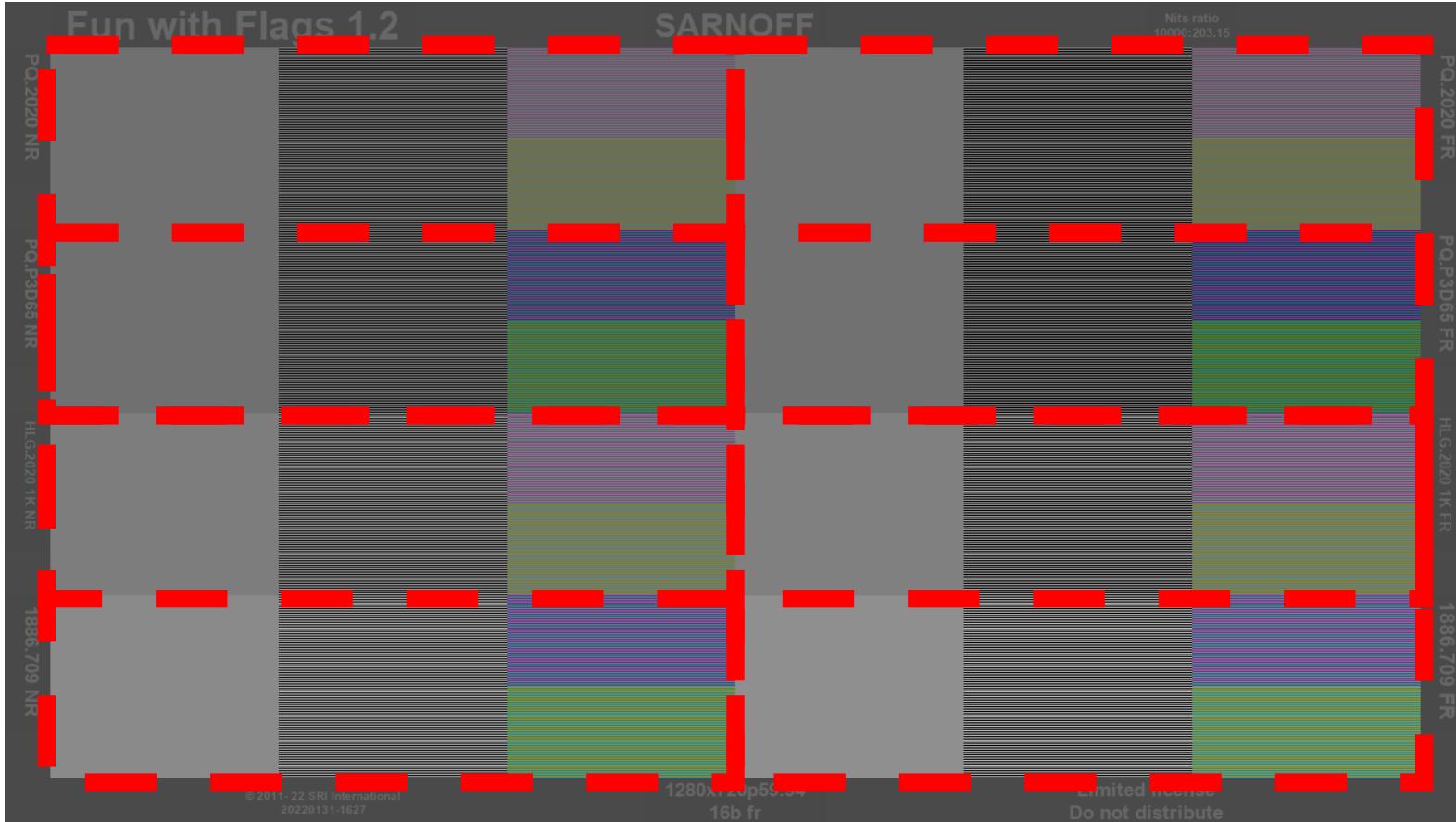
- Harvey Landy (Universal)
- Grading session on Ref Monitor
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- **Is it set to the one I need?**
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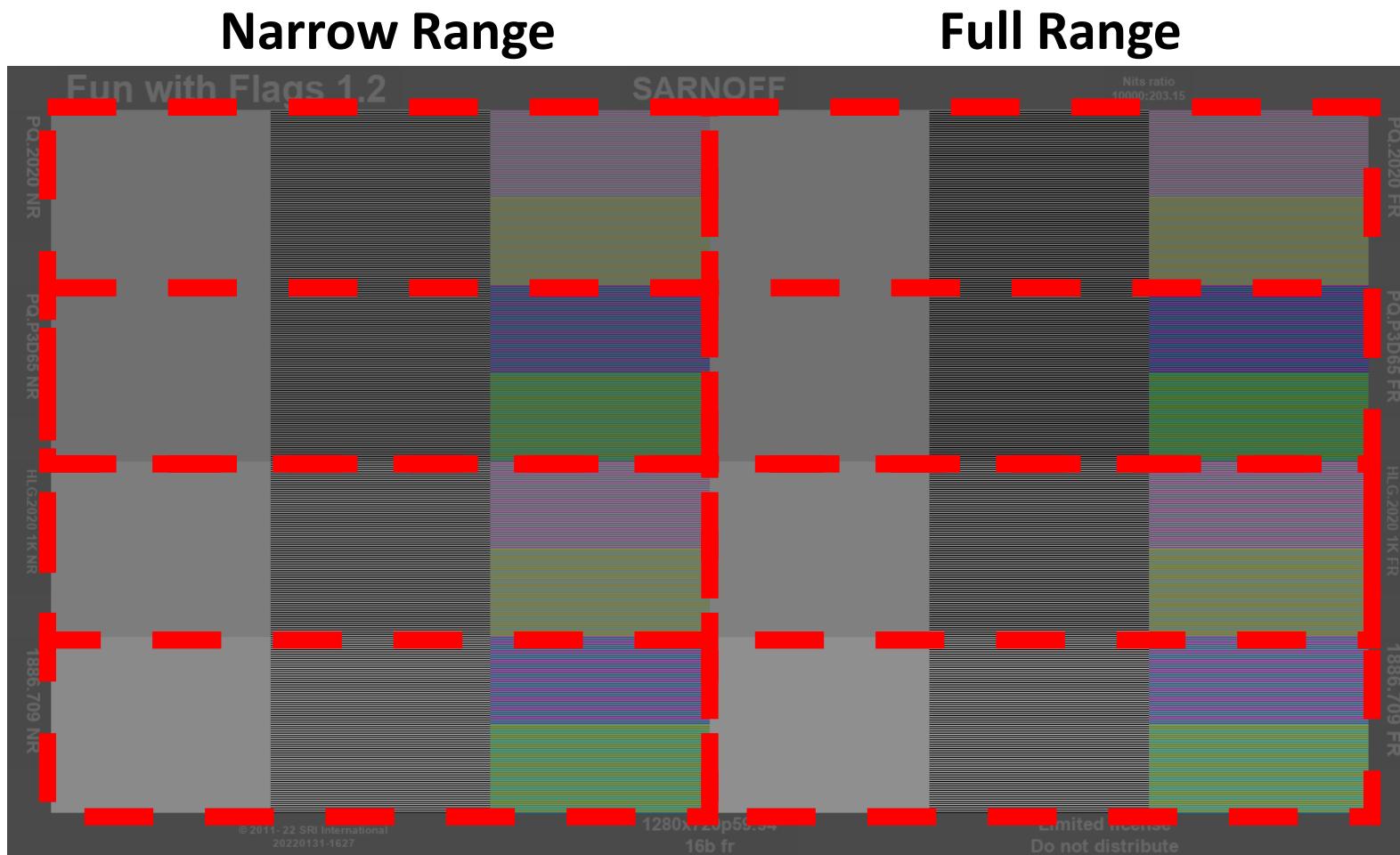
# “Fun with Flags”



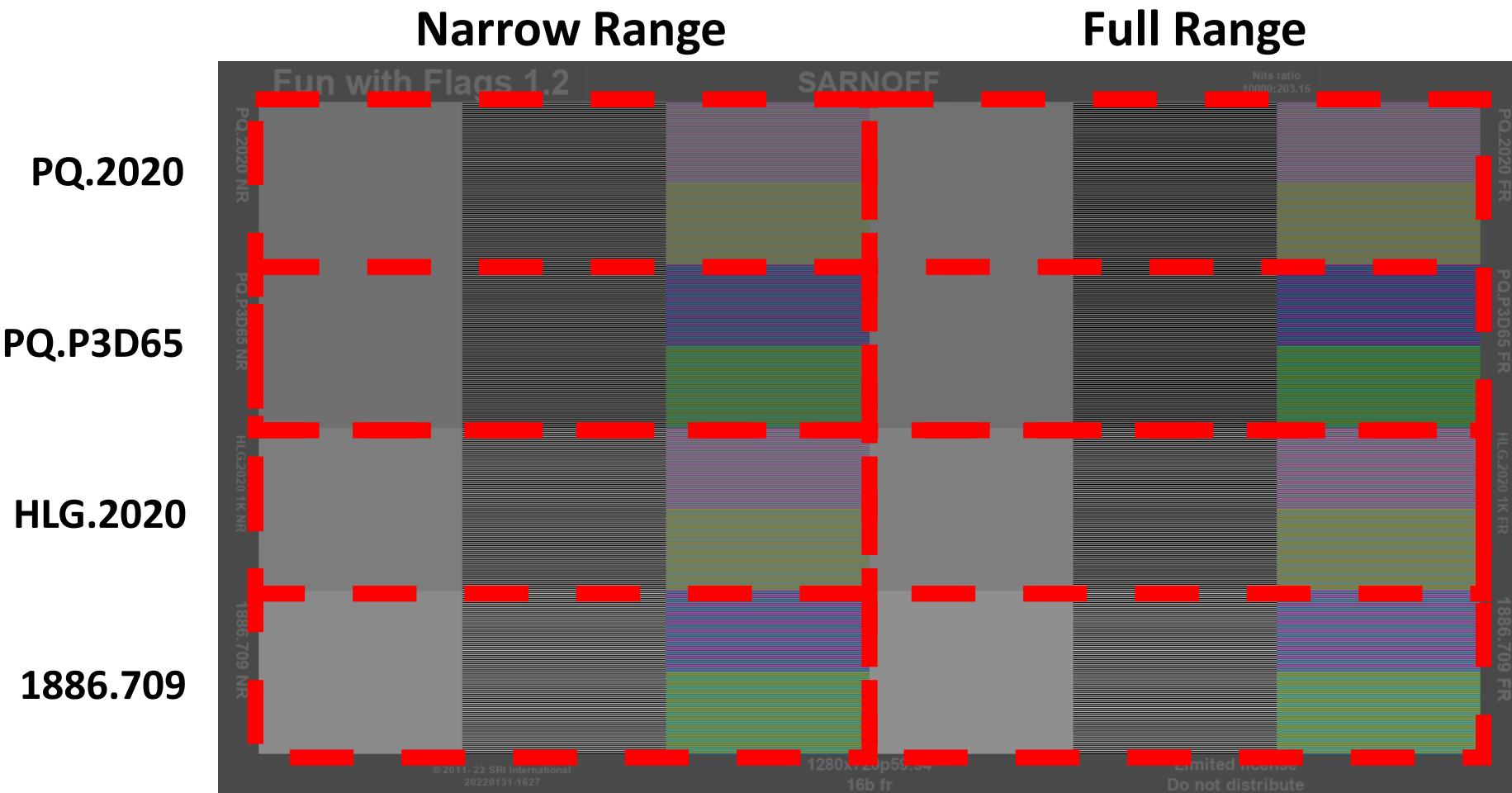
# Fun with Flags



# Fun with Flags

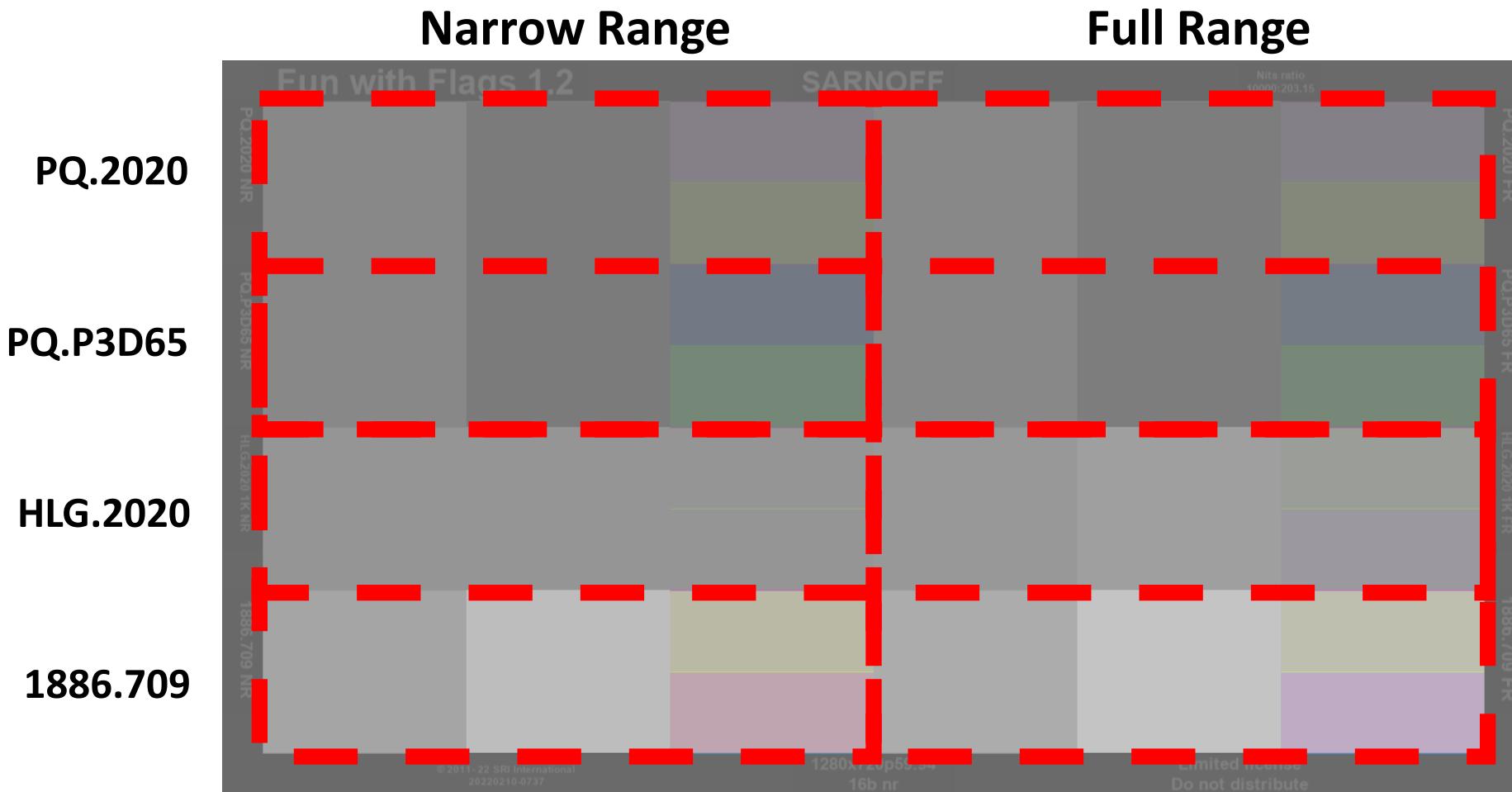


# Fun with Flags



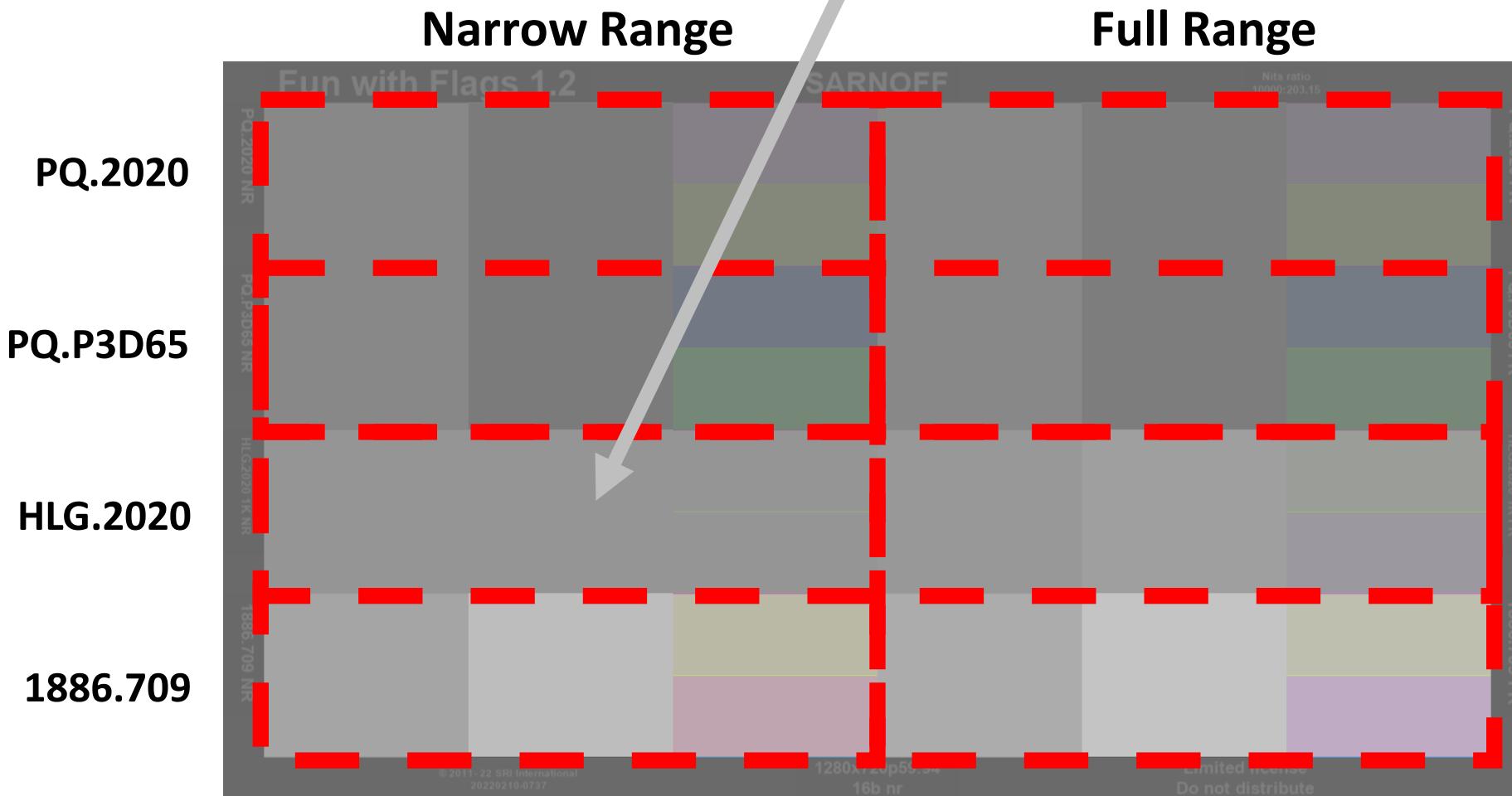
# Fun with Flags

Look for “all gray” flag



# Fun with Flags

Look for “all gray” flag



# Fun with Flags

Look for “all gray” flag

PQ.2020

PQ.P3D65

HLG.2020

**1886.709**



# Fun with Flags

Look for “all gray” flag

PQ.2020

PQ.P3D65

HLG.2020

1886.709

Narrow Range

Full Range



# Fun with Flags

Look for “all gray” flag

PQ.2020

PQ.P3D65

HLG.2020

1886.709

Narrow Range

Full Range



# Fun with Flags

Look for “all gray” flag

PQ.2020

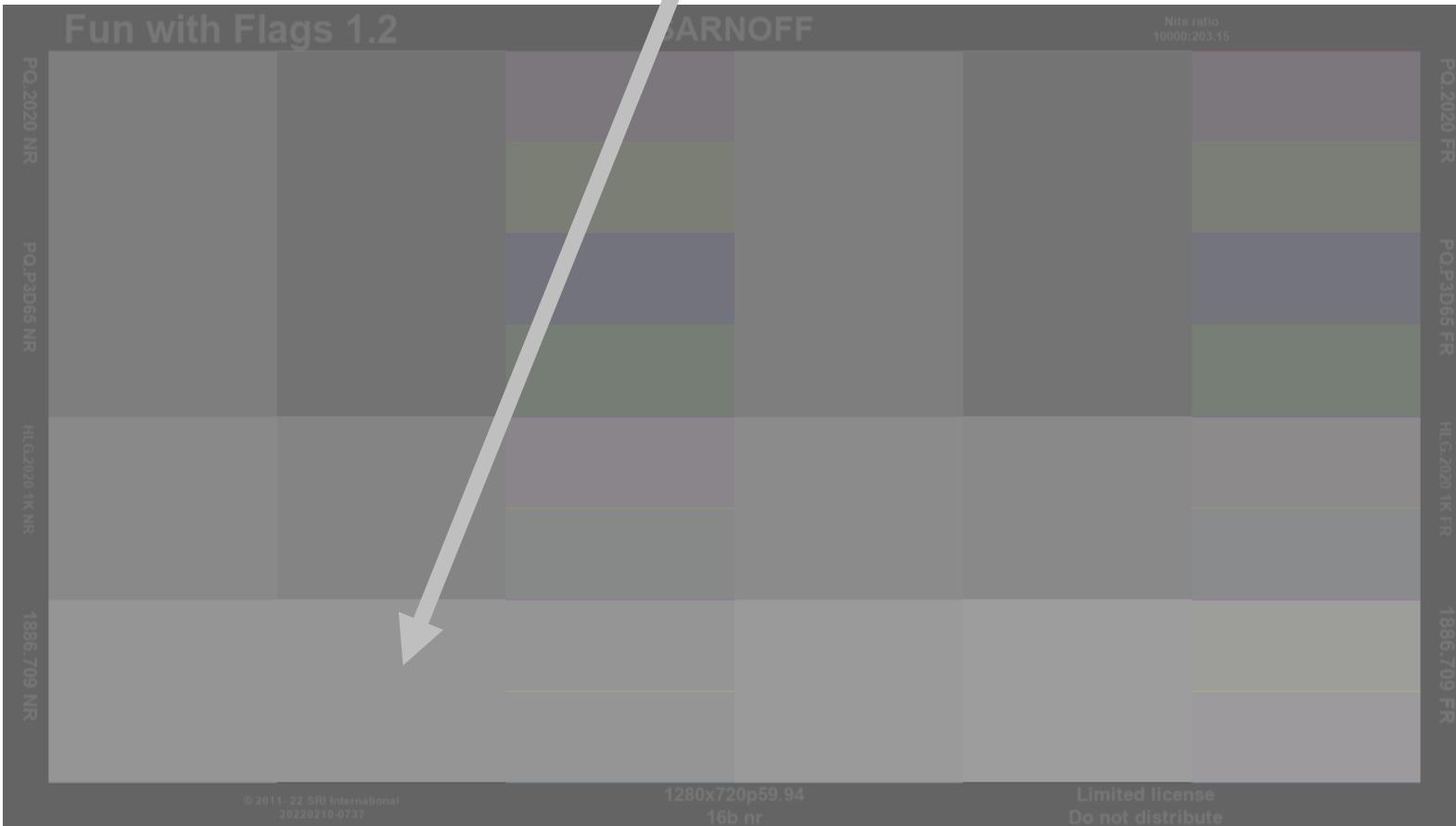
PQ.P3D65

HLG.2020

**1886.709**

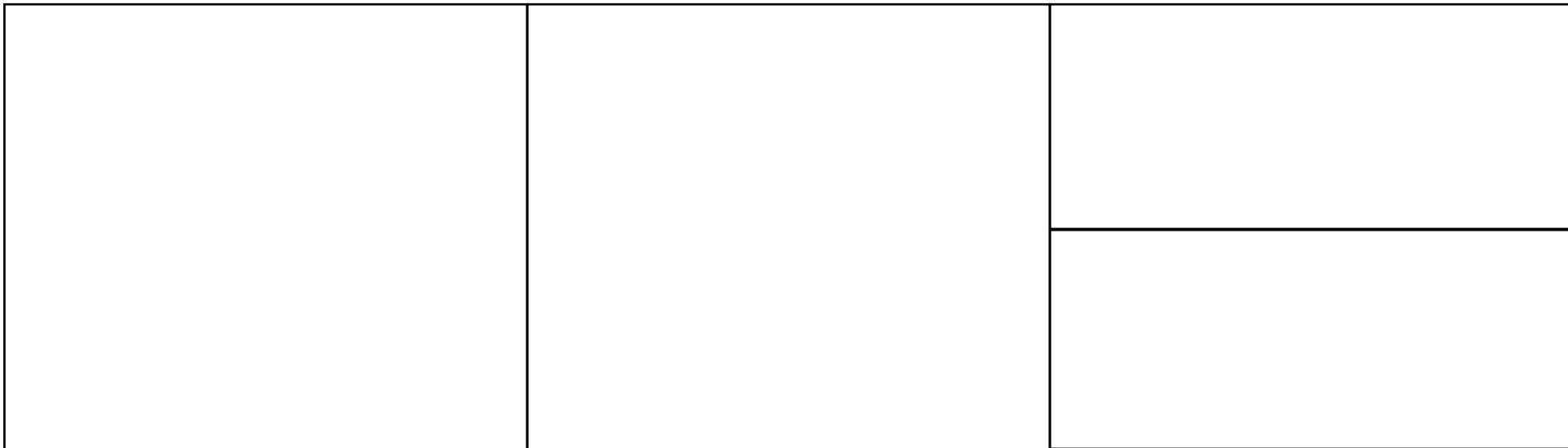
Narrow Range

Full Range

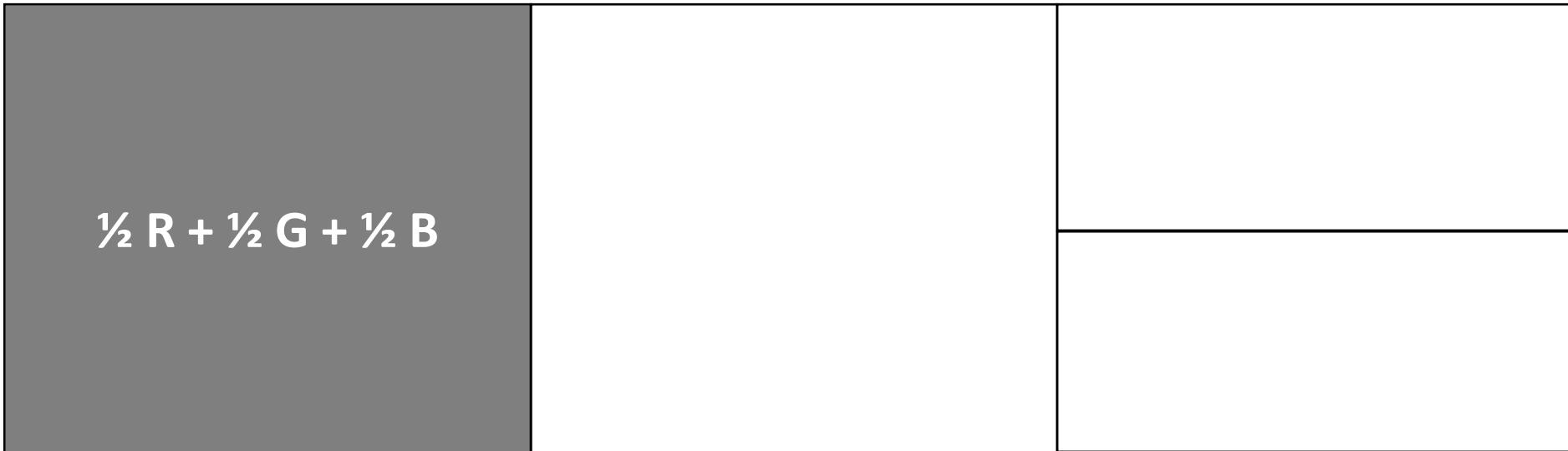


# How does it work?

# Anatomy of a 'Flag'

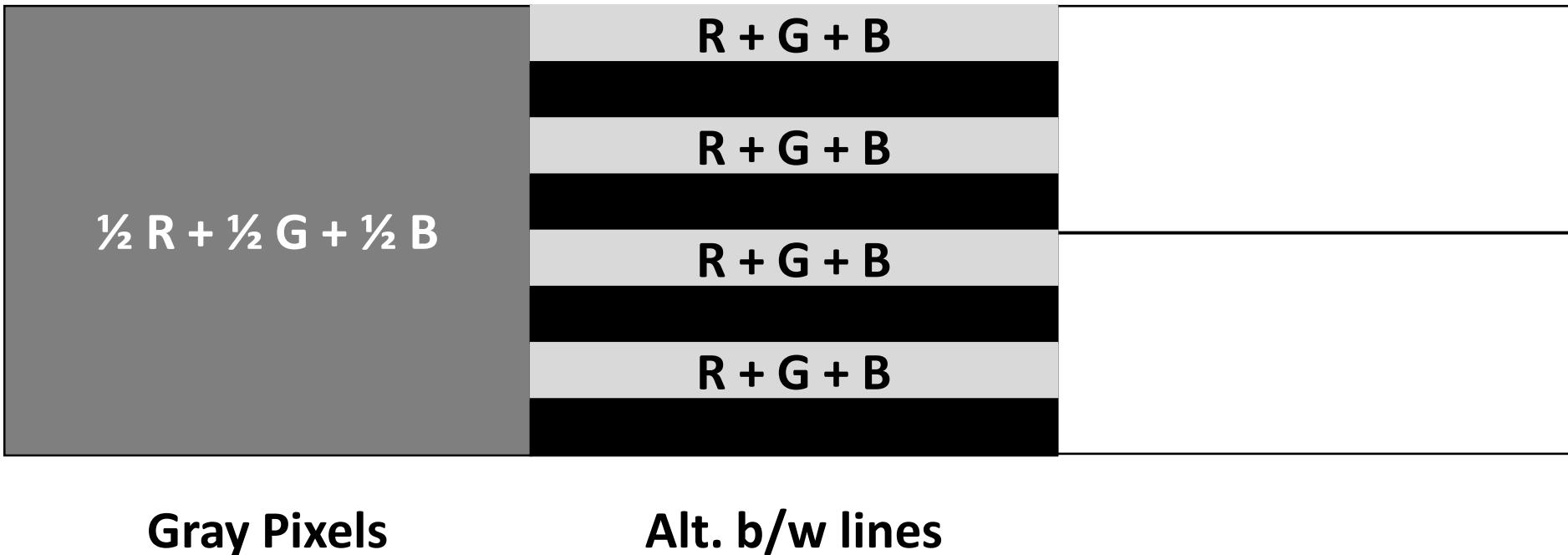


# Anatomy of a 'Flag'



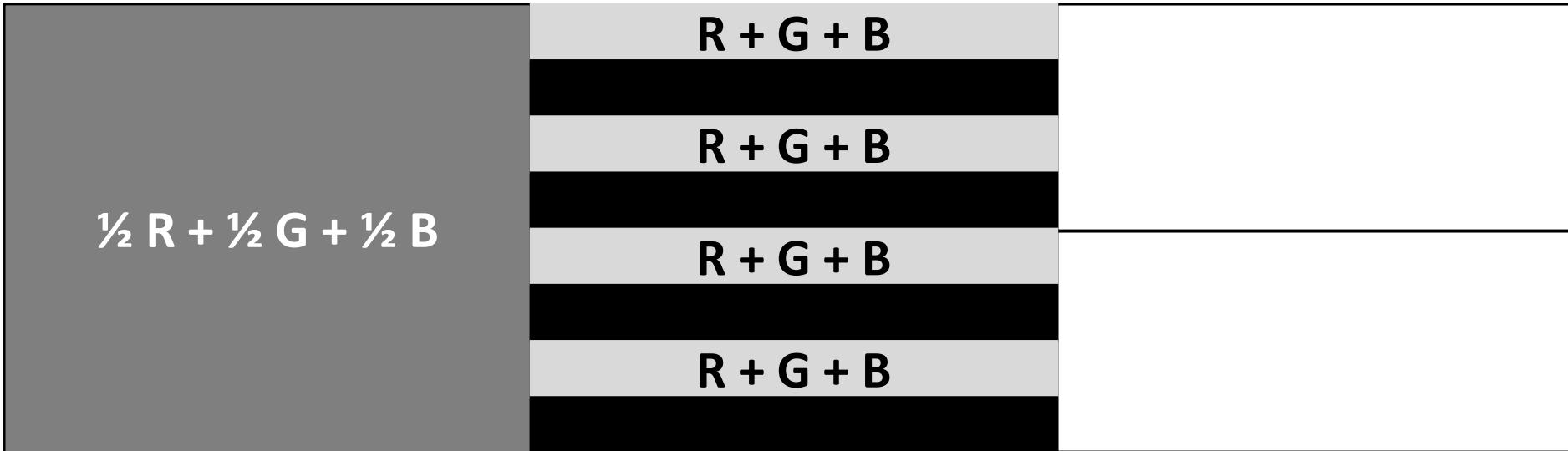
**Gray Pixels**

# Anatomy of a 'Flag'



## Anatomy of a 'Flag'

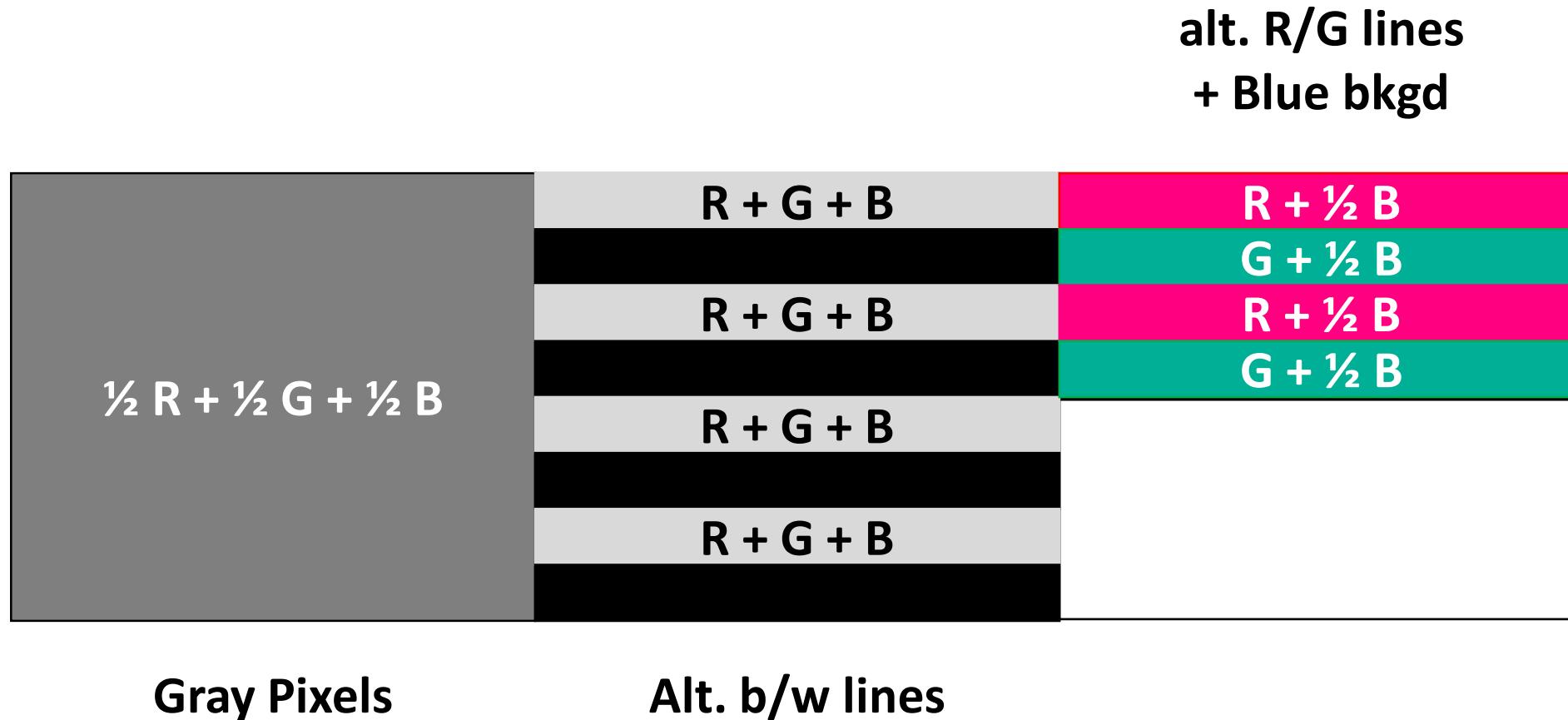
$$\frac{1}{2} R + \frac{1}{2} G + \frac{1}{2} B = (R + G + B + 0 + 0 + 0) / 2$$



Gray Pixels

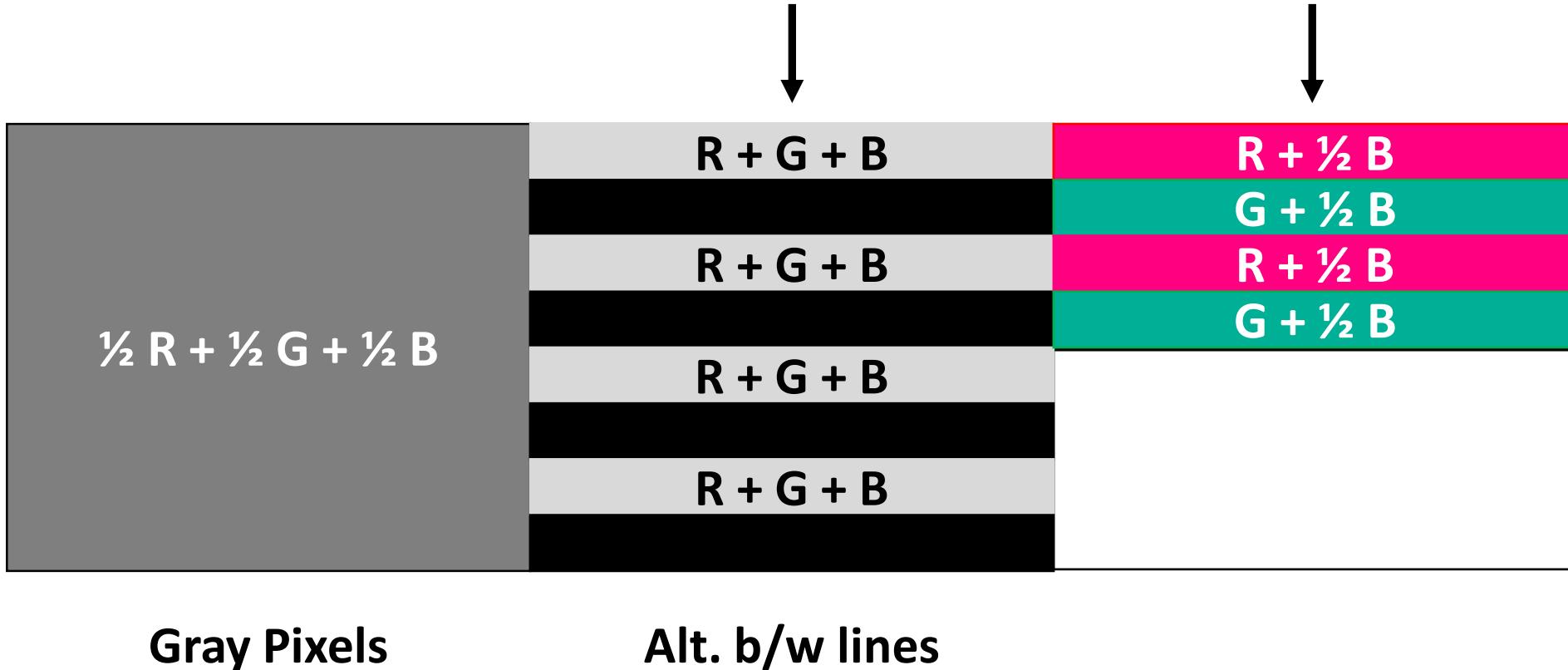
Alt. b/w lines

# Anatomy of a 'Flag'

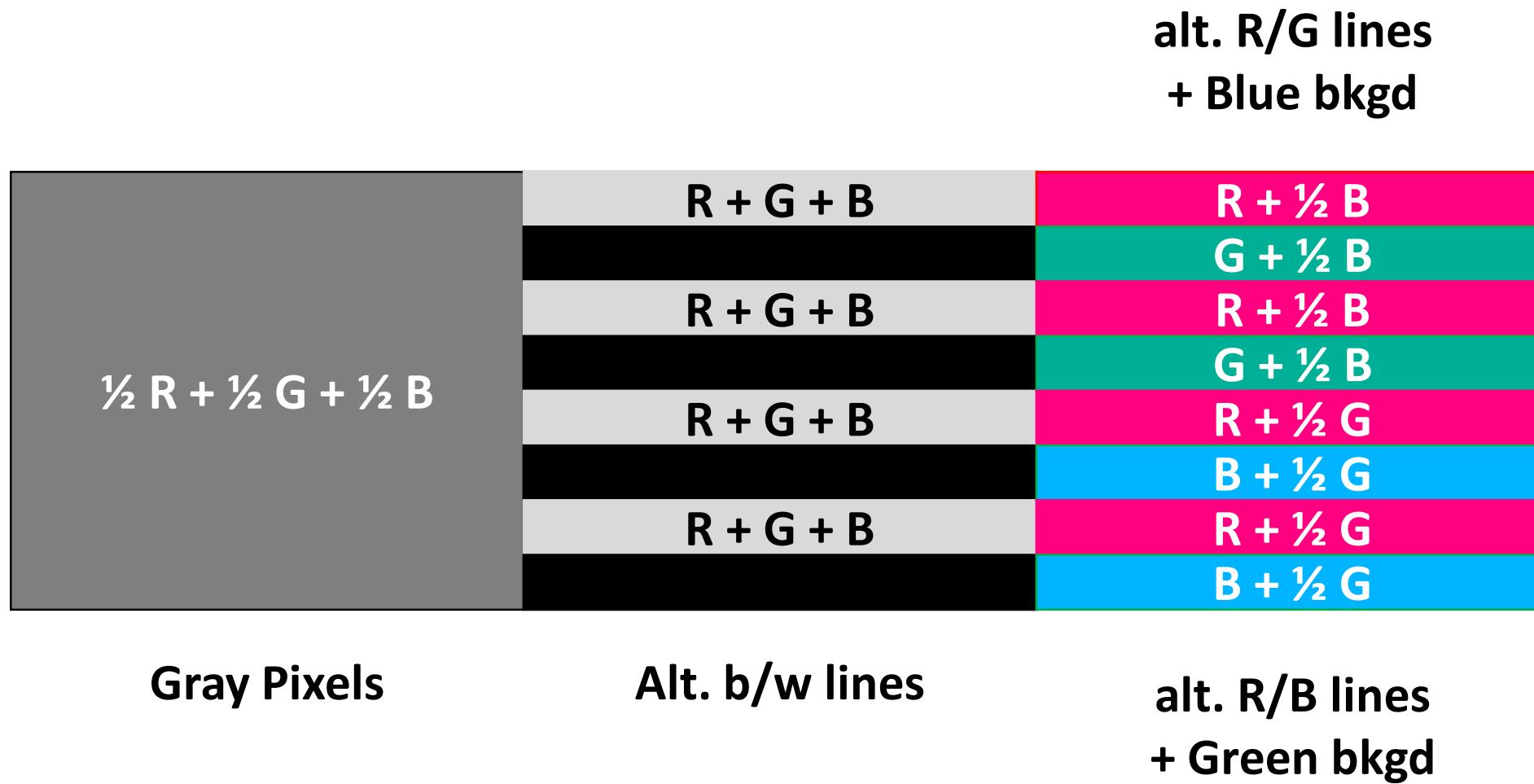


## Anatomy of a 'Flag'

$$\frac{1}{2} R + \frac{1}{2} G + \frac{1}{2} B = \frac{(R + 0 + \frac{1}{2} B + 0 + G + \frac{1}{2} B)}{2}$$



# Anatomy of a 'Flag'



# “Fun with Flags”



## Fun with Flags



Email me: →  
[norm.hurst@sri.com](mailto:norm.hurst@sri.com)

## Gamut Circles

