



MID-ATLANTIC MEGALOPOLIS PROJECT

Funded by the Advancing Digitization of Biodiversity Collections program of the National Science Foundation.



Muhlenberg College



NYBG



LIGHT BOX DESIGN: A CAUTIONARY TALE



The screenshot shows the iDigBio website interface. At the top, there is a navigation bar with links for 'About iDigBio', 'Research', 'Technical Information', and 'Education'. Below this is a search bar and a 'Log in | Sign up' link. A yellow banner contains two notices: 'Data release update: 04/01/2018 (MAM) to 05/01/2018 (MAM)' and 'Data release update: 04/01/2018 (MAM) to 05/01/2018 (MAM)'. The main navigation bar includes 'About iDigBio', 'Collaborators', 'Upcoming Events', 'News', 'Contact', and 'Site Map'. The article title is 'How to, and how not to, design a light box: A cautionary tale'. The main image is a photograph of a 'Photo-e-Box Plus' light box with a sign that says 'OUT OF BUSINESS' and 'What can we do?'. The author information is 'by C. Skema, Anne Barber, and Tim Stock'. The text below the image describes the challenges faced by the Mid-Atlantic Megalopolis (MAM) Thematic Collections Network in procuring light boxes after the manufacturer went out of business.

Researchers
Browse our specimen portal →

Collections Staff
Learn how your collection can benefit from our work →

Teachers & Students
Learning resources & opportunities to engage →

Photo-e-Box Plus™
OUT OF BUSINESS
What can we do?

ORTECH
Professional Lighting

by C. Skema, Anne Barber, and Tim Stock

Shortly after the **Mid-Atlantic Megalopolis (MAM)** Thematic Collections Network received its funding from the National Science Foundation in September 2016, the main manufacturer of herbarium light boxes went out of business. By buying up the last of the light box stock available in the marketplace, most of our collaborators managed to procure a box, but three were left without one. We were barely a few months into the grant and we had already hit a significant obstacle in equipment procurement. What to do? We found a local design/build firm that was willing to design and produce four light boxes for the MAM Project. The design process was a steep learning curve for MAM, but we put our heart and

<https://www.idigbio.org/content/how-and-how-not-design-light-box-cautionary-tale>
cskema@upenn.edu

ADBC Summit
Gainesville, FL
Wednesday 3 October 2018



FINE FOCUS:

**A tool for the objective
evaluation of focus
quality in herbarium
specimen imaging**

“SOFT” FOCUS ISSUES

- collaborators reporting soft focus issues
 - random specimens not quite in focus(1:1), seen in image processing

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Standard Deviation of Contrast Values



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 - → repeated imaging needed to understand focus quality possibilities for any one specimen

20-SPECIMEN TEST CASE

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 - Live View vs. no Live View
 - macro 50 mm lens (Canon, Sigma) vs. standard 50 mm lens (Canon)

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- varied treatment by specimen – to allow for single placement of sheet

20-SPECIMEN TEST CASE

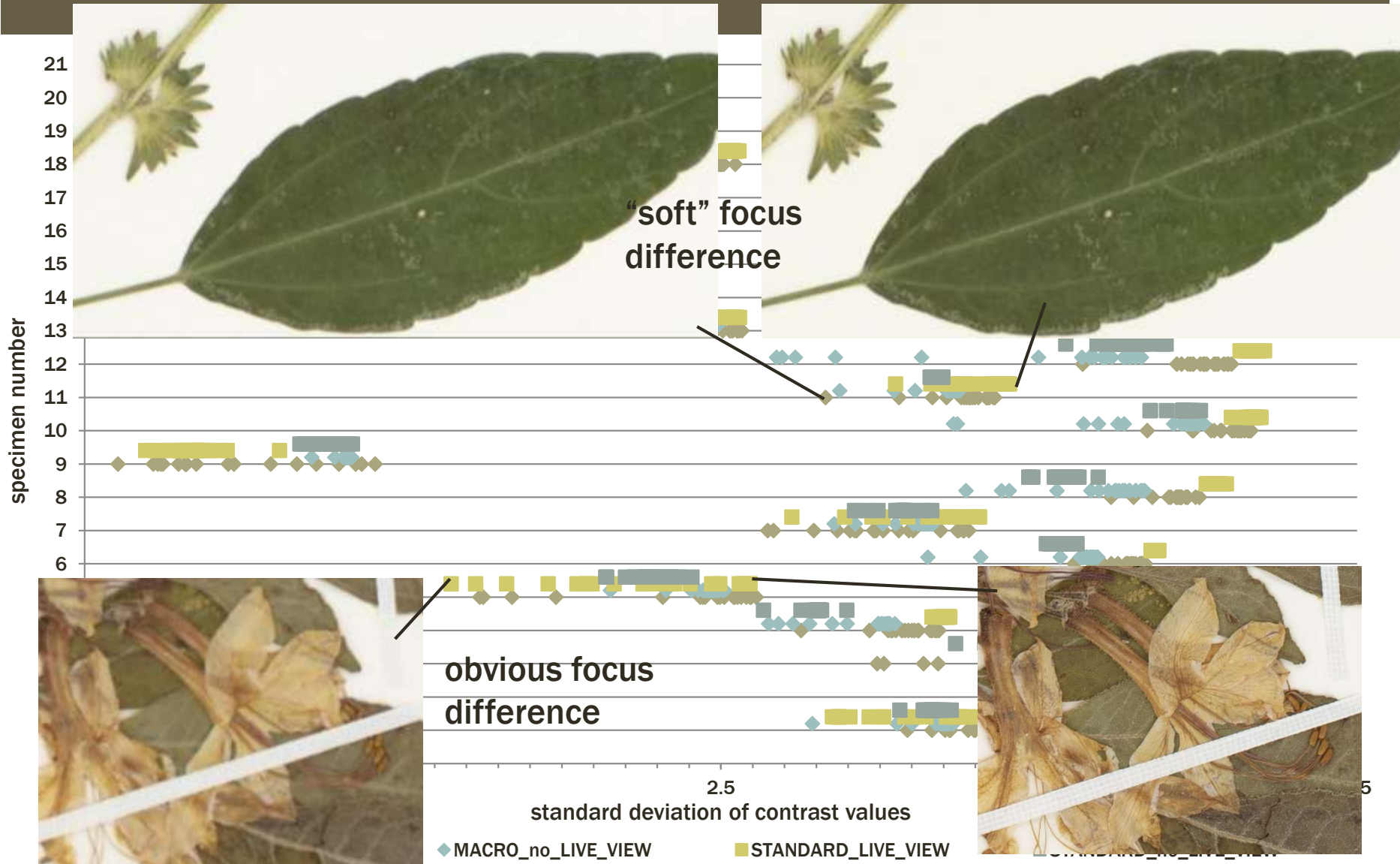


IMAGE QUALITY MATTERS



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- downstream effects of focus issues not fully known



IMAGE QUALITY MATTERS



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- downstream effects of focus issues not fully known
- need more consistent focus quality from same equipment that will work with batch imaging (100-200 sheets/batch)



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- use standard text target and numeric value to manually focus lens to optimal focus quality



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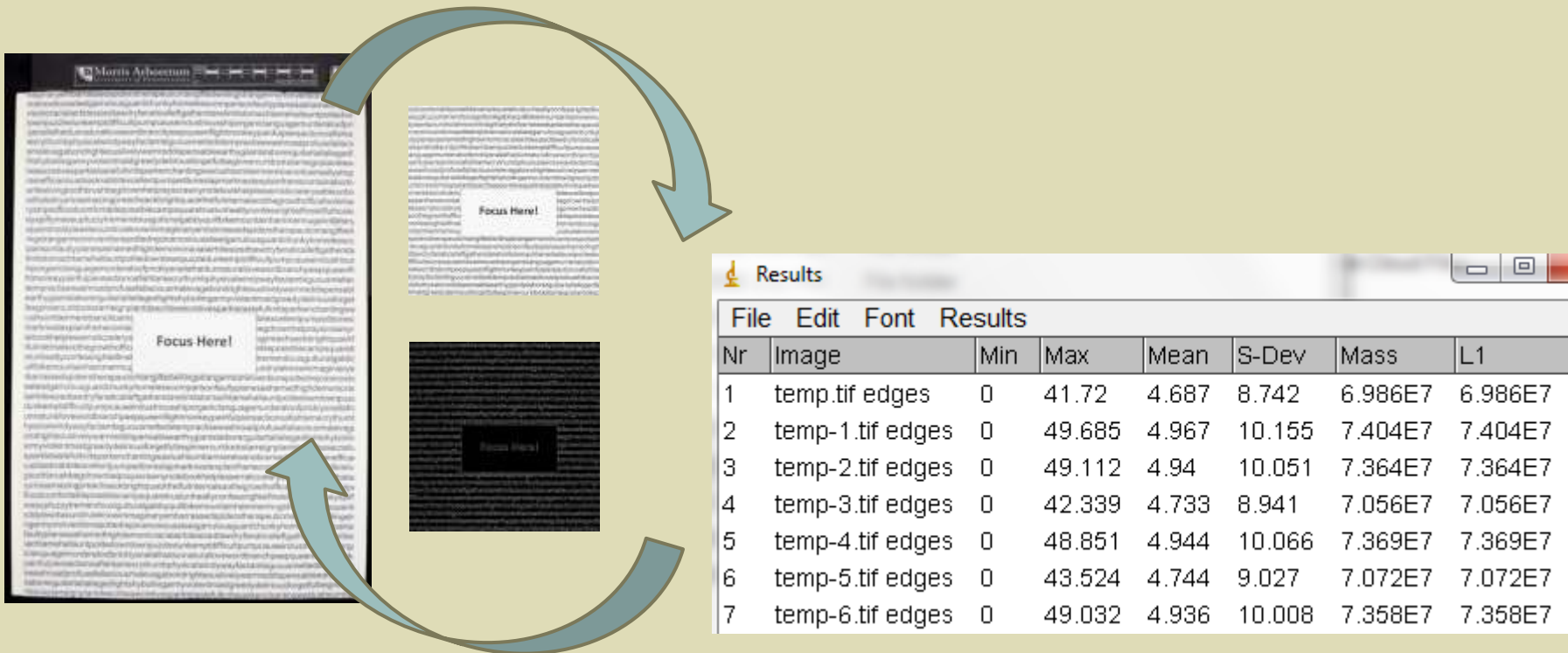
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Results							
File Edit Font Results							
Nr	Image	Min	Max	Mean	S-Dev	Mass	L1
1	temp.tif edges	0	42.451	1.293	2.786	1.927E7	1.927E7

FINE FOCUS

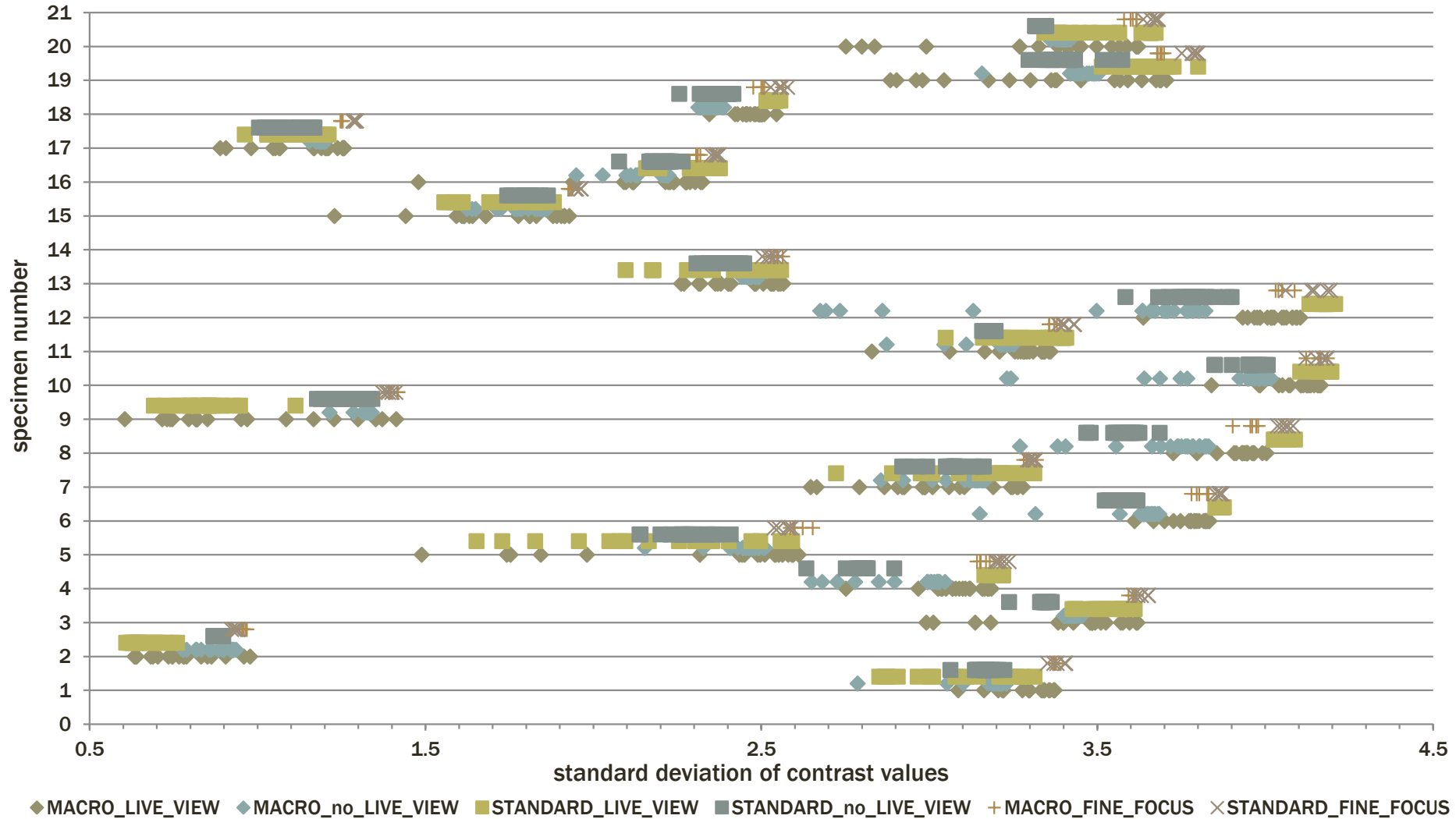
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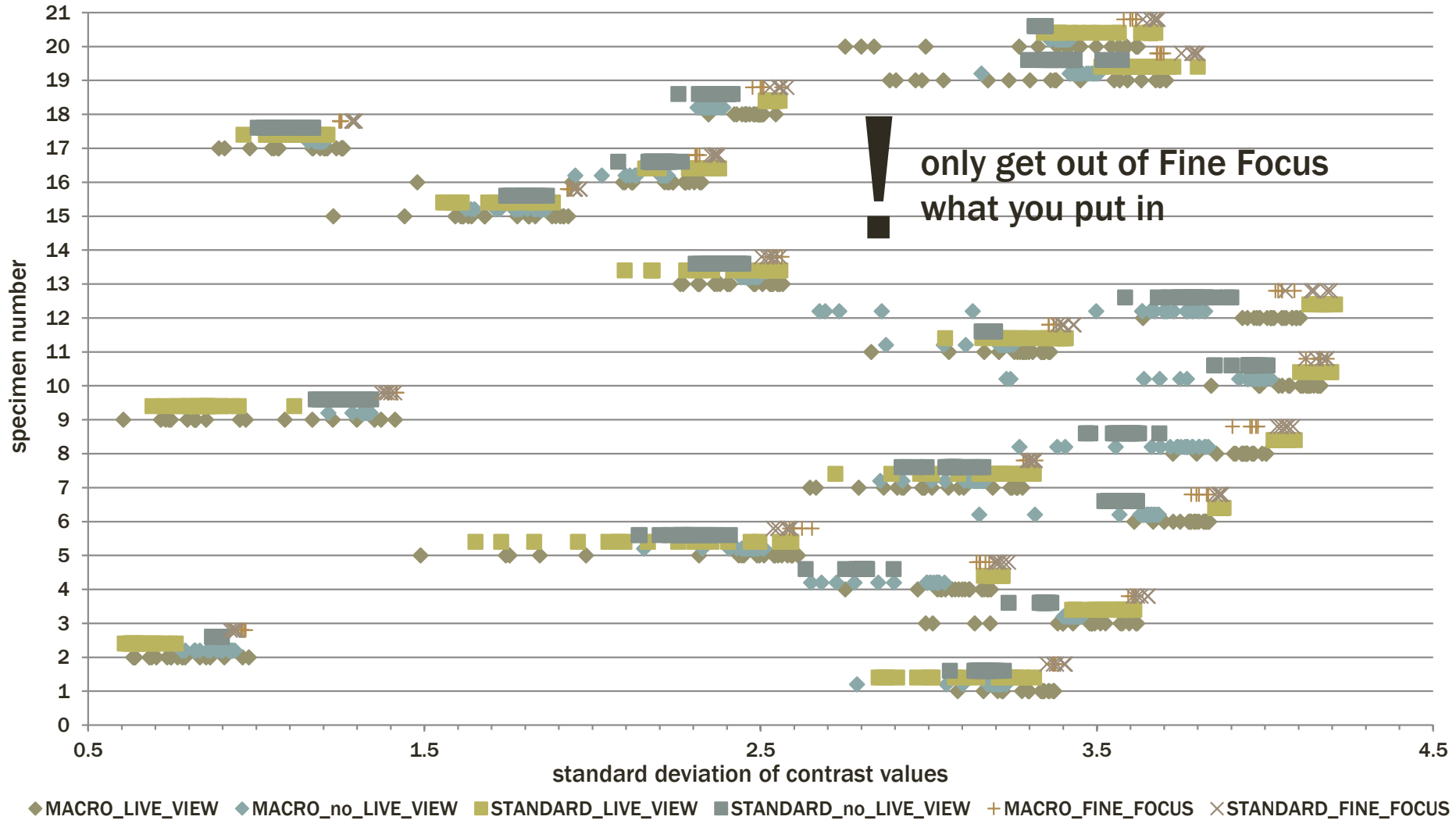
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- use standard text target and numeric value to manually focus lens to optimal focus quality
- numeric value (st. dev. contrast value) generated through image analysis via batch file, using IrfanView and ImageJ
- “lock in” good focal point by switching lens back to autofocus (drift)
- image a batch of specimens without changing focal point

20-SPECIMEN TEST CASE + FINE FOCUS



20-SPECIMEN TEST CASE + FINE FOCUS

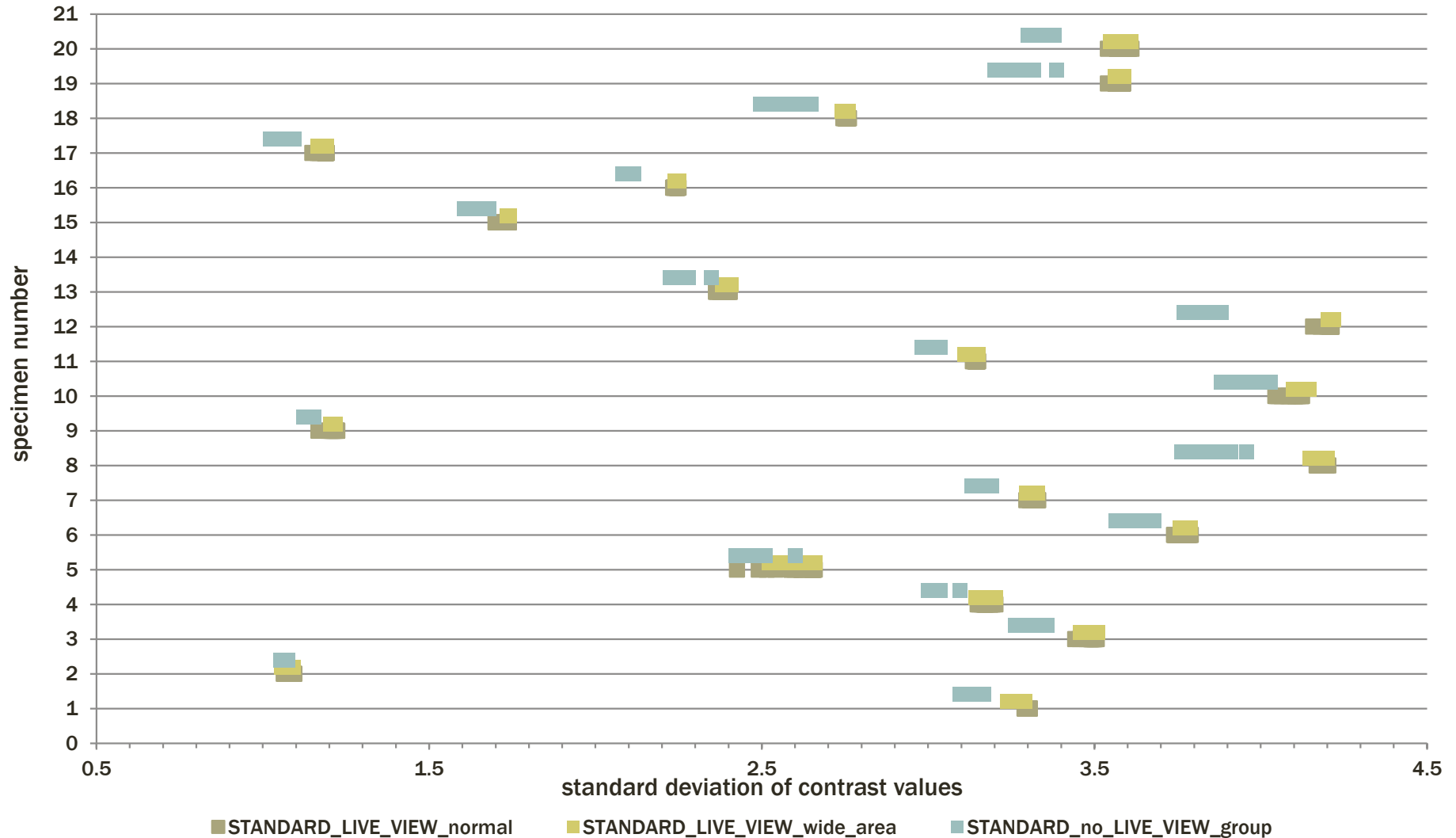


is this only a Canon problem?

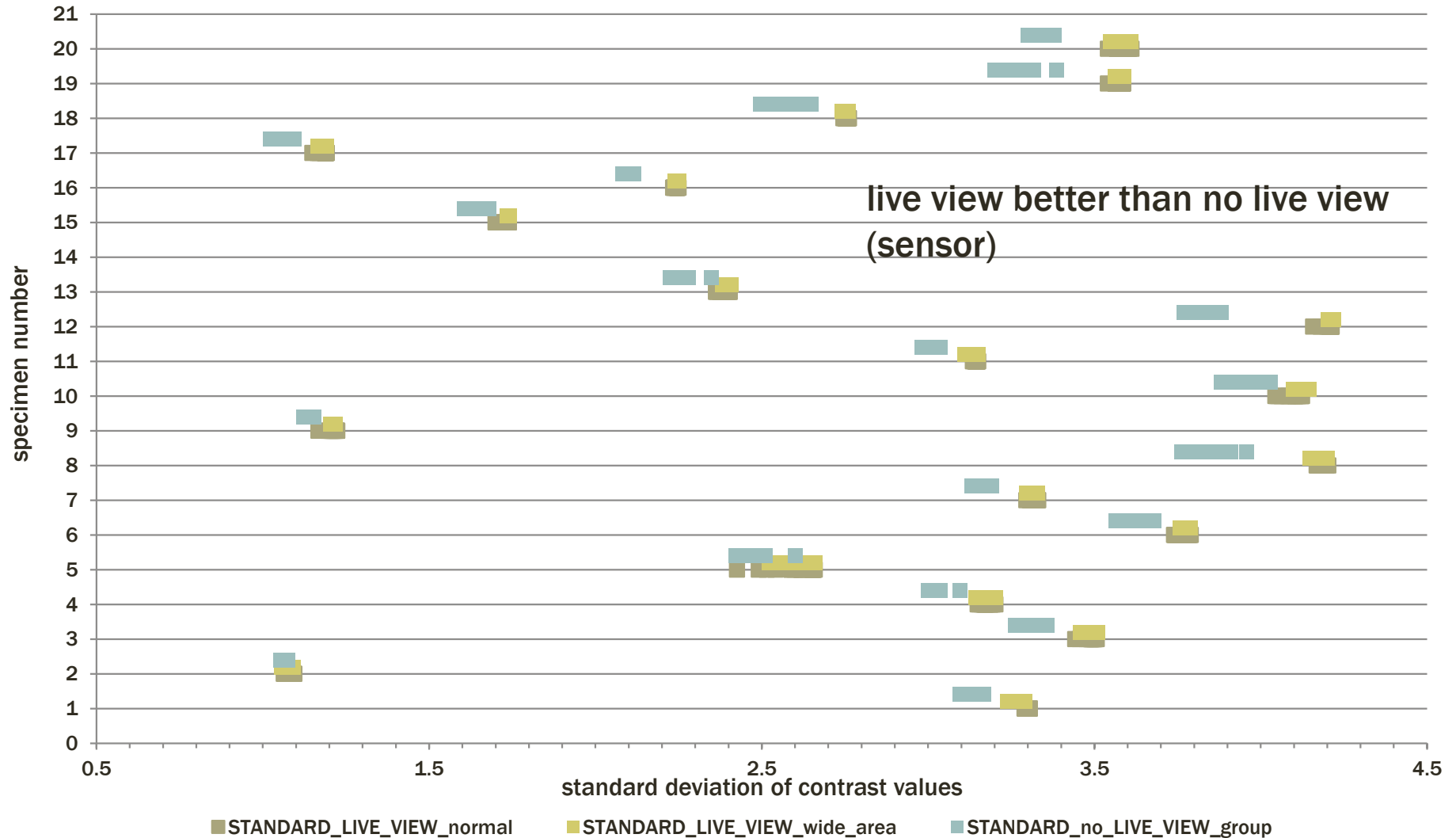
20-SPECIMEN TEST CASE: NIKON

- 20 specimens, all “2-D” but with variation in material
- repeated imaging (20-50x) of single sheets
- Nikon D850 DSLR (46 mp), standard 50 mm lens (Nikkor)
- camera settings held constant (1/100, f9, ISO100, picture auto-settings off)
- white-balanced to color checker by batch
- treatments:
 - Live View (two focal options) vs. no Live View
- varied treatment by specimen – to allow for single placement of sheet

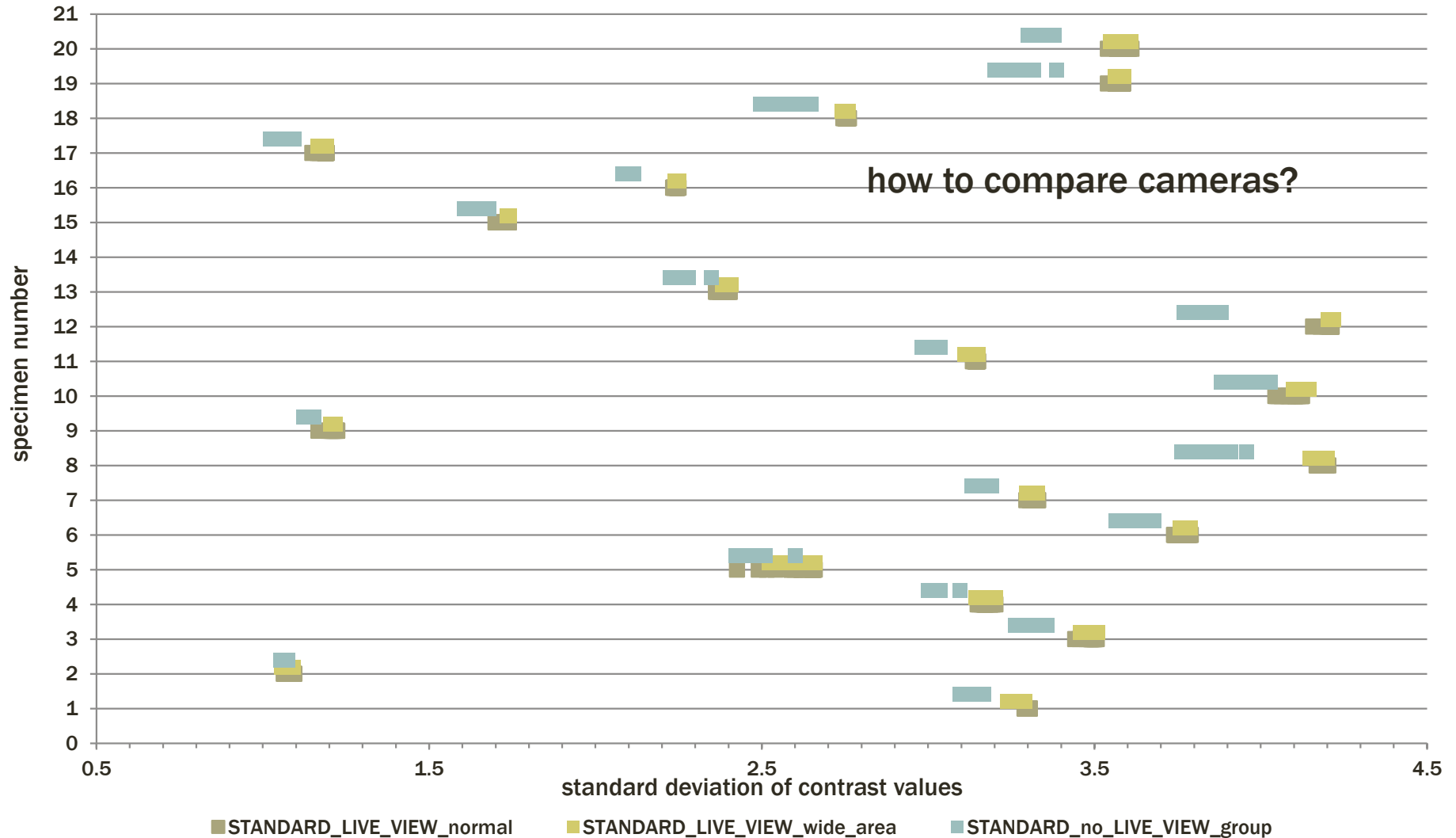
20-SPECIMEN TEST CASE: NIKON



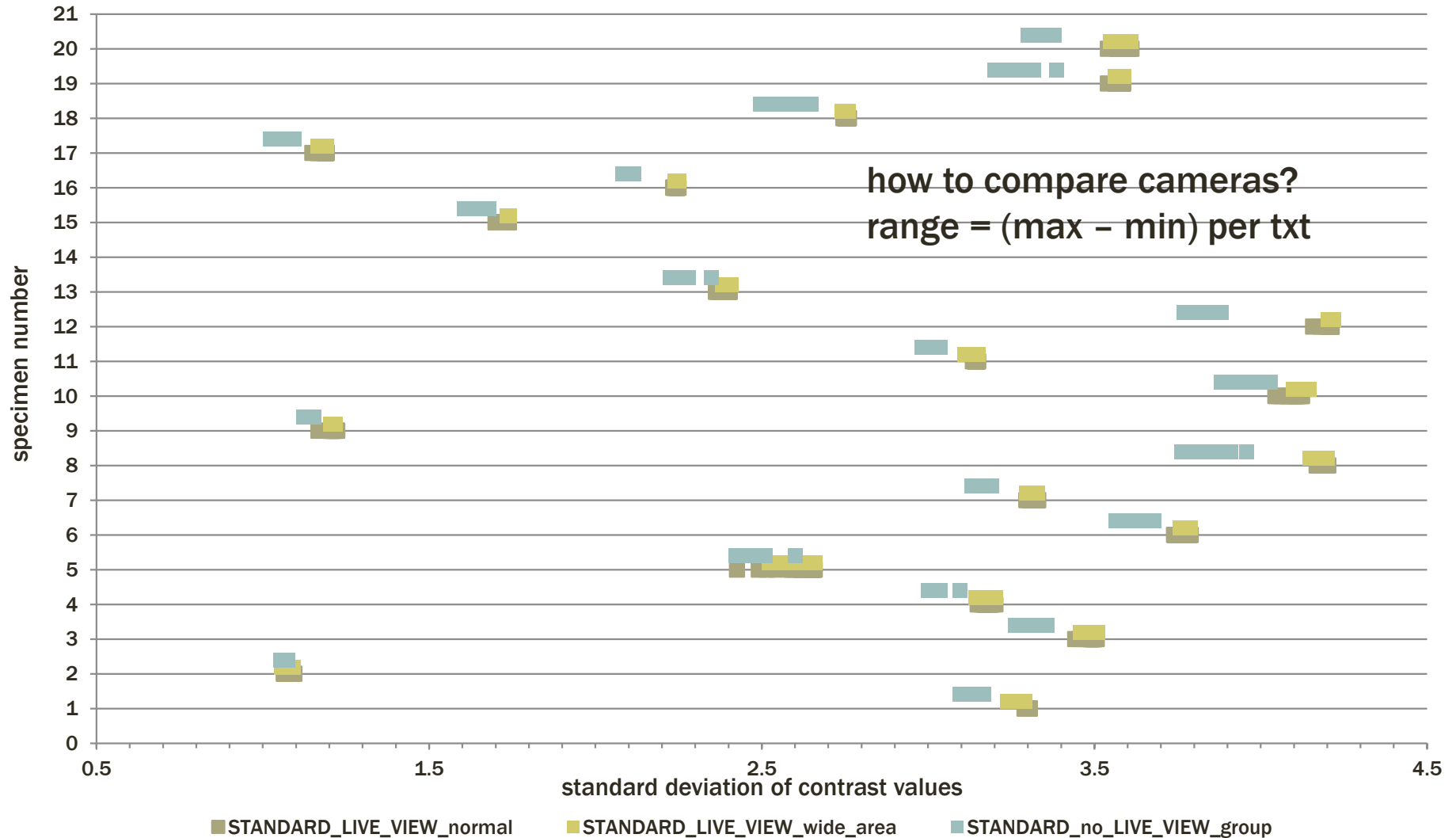
20-SPECIMEN TEST CASE: NIKON



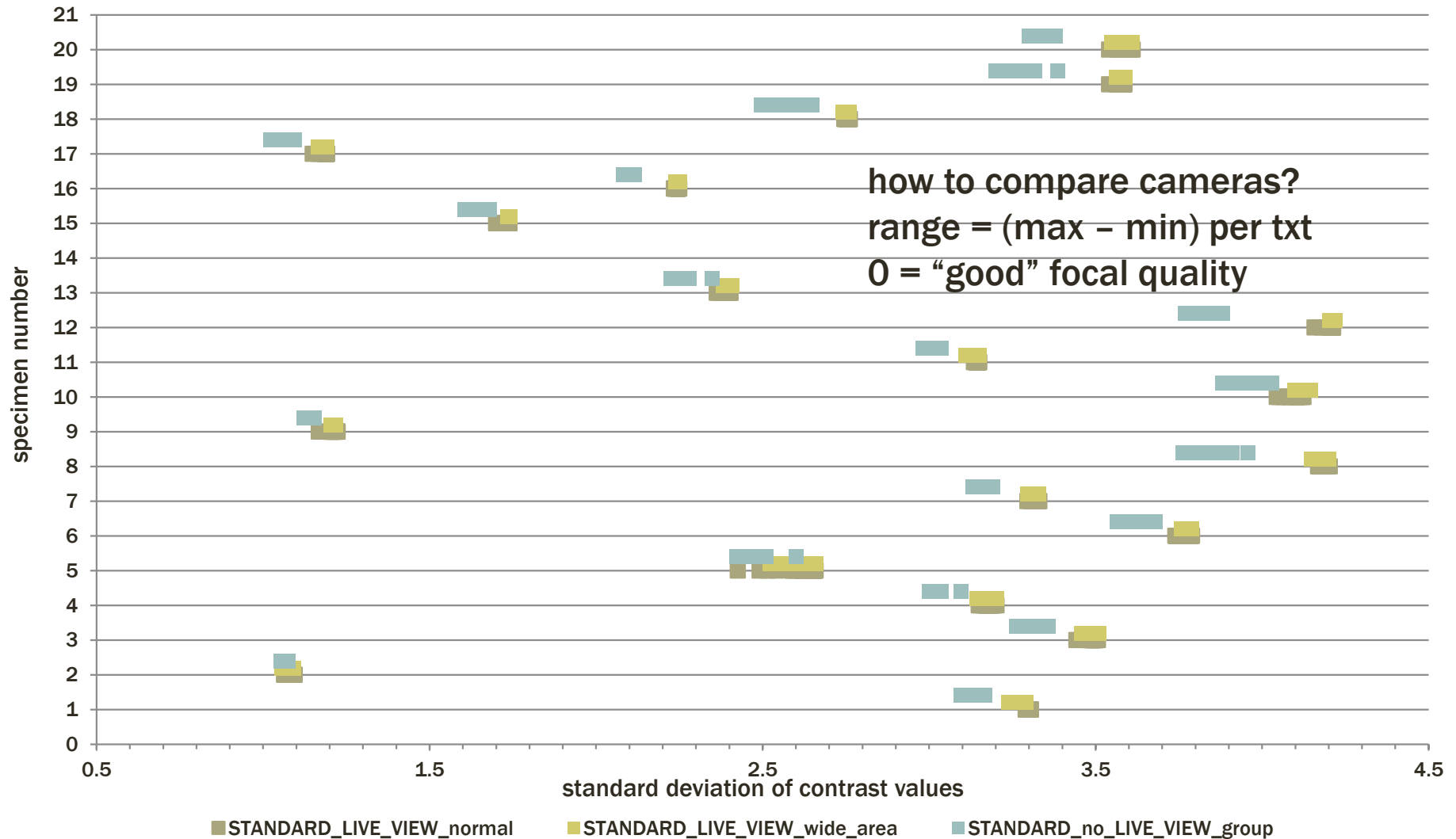
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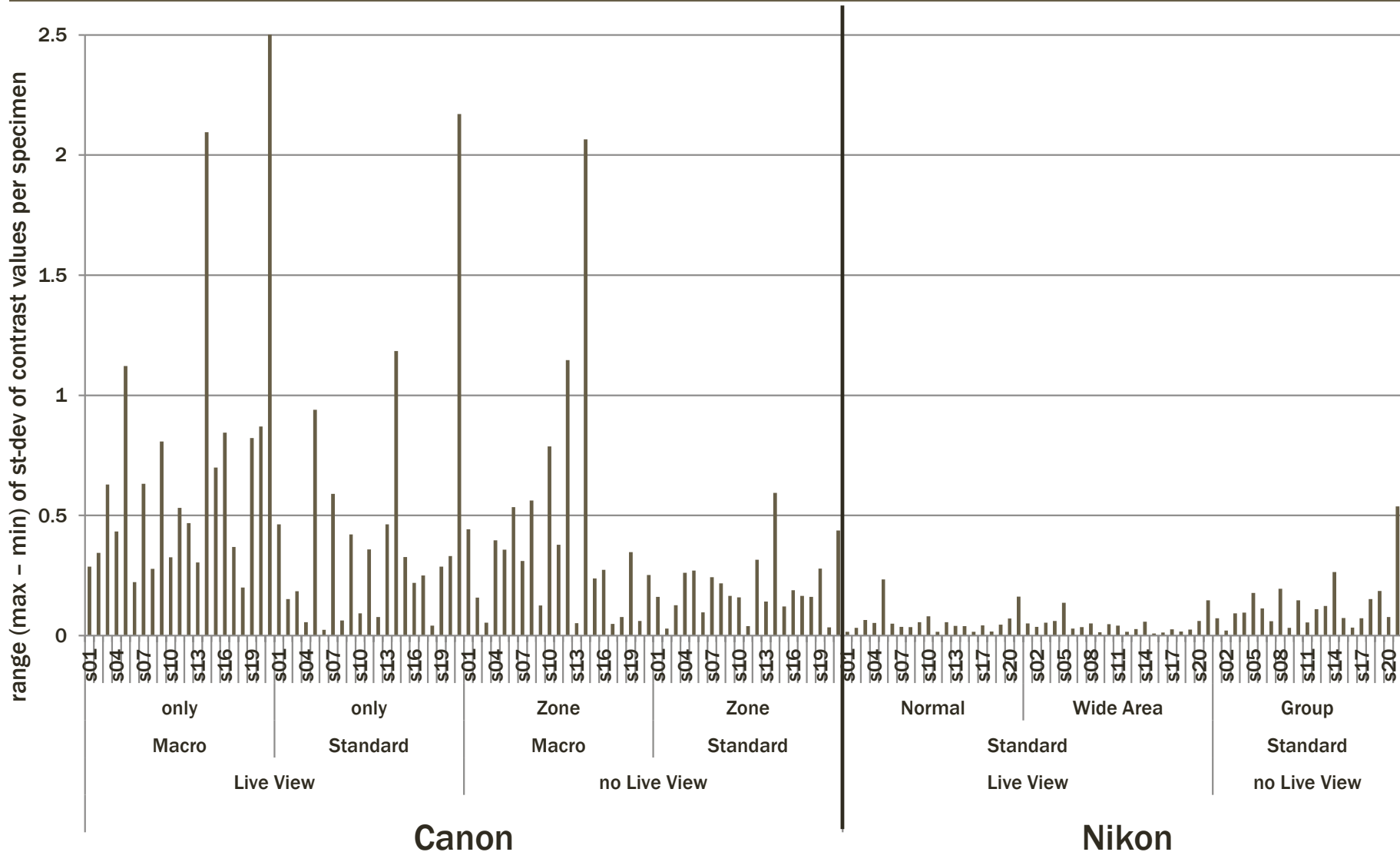
Canon



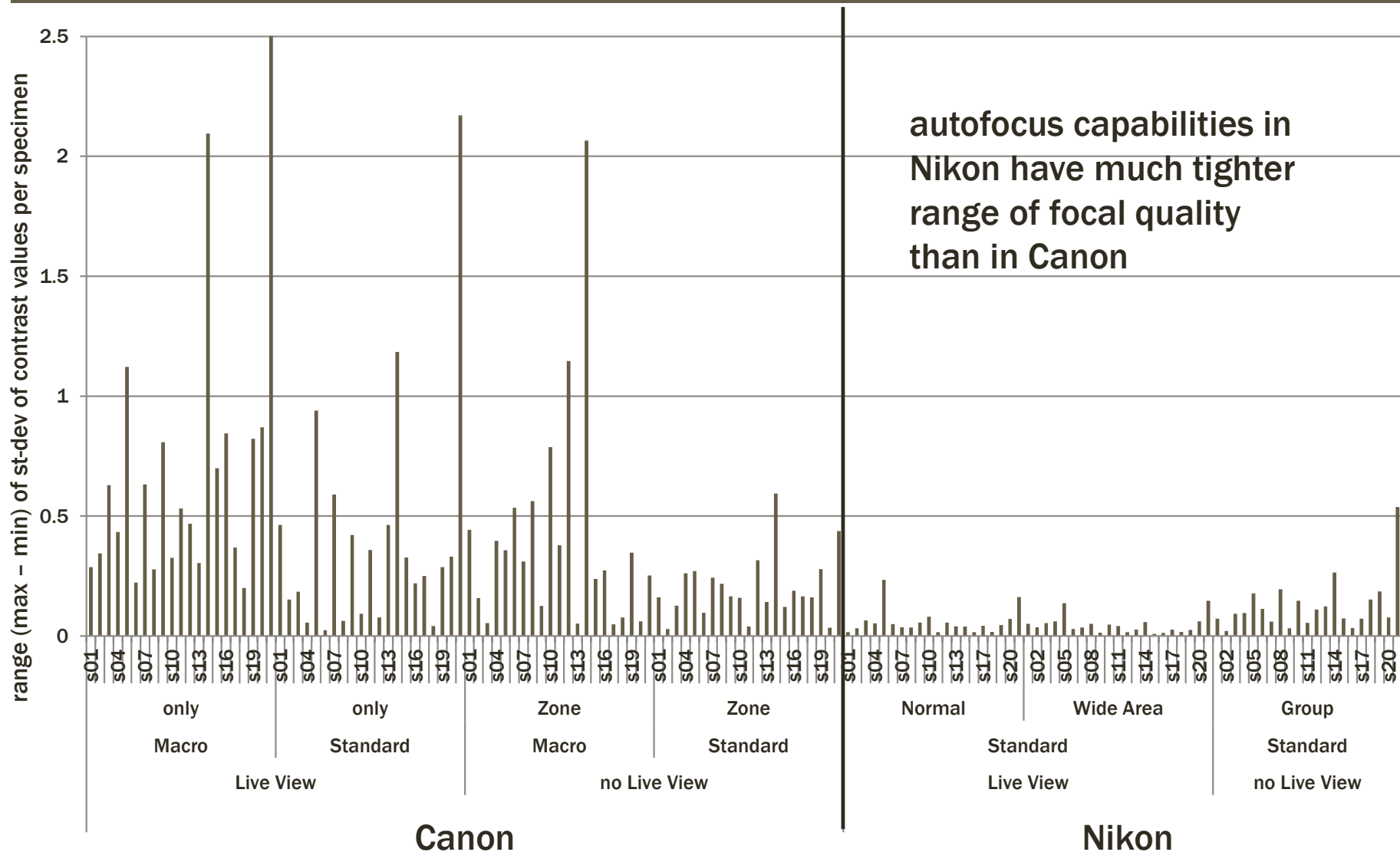
Nikon



RANGE OF FOCAL QUALITY: CANON VS. NIKON



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 - provides objective (but relative!) measure of focal quality
 - can narrow focal quality to upper end of range (when done correctly!)
- Nikon autofocus better in Live View than without Live View
- Nikon autofocus has tighter range around optimal focal quality than Canon

FOR MORE INFO...

- cskema@upenn.edu
- mamdigitization.org – project website & FineFocus download



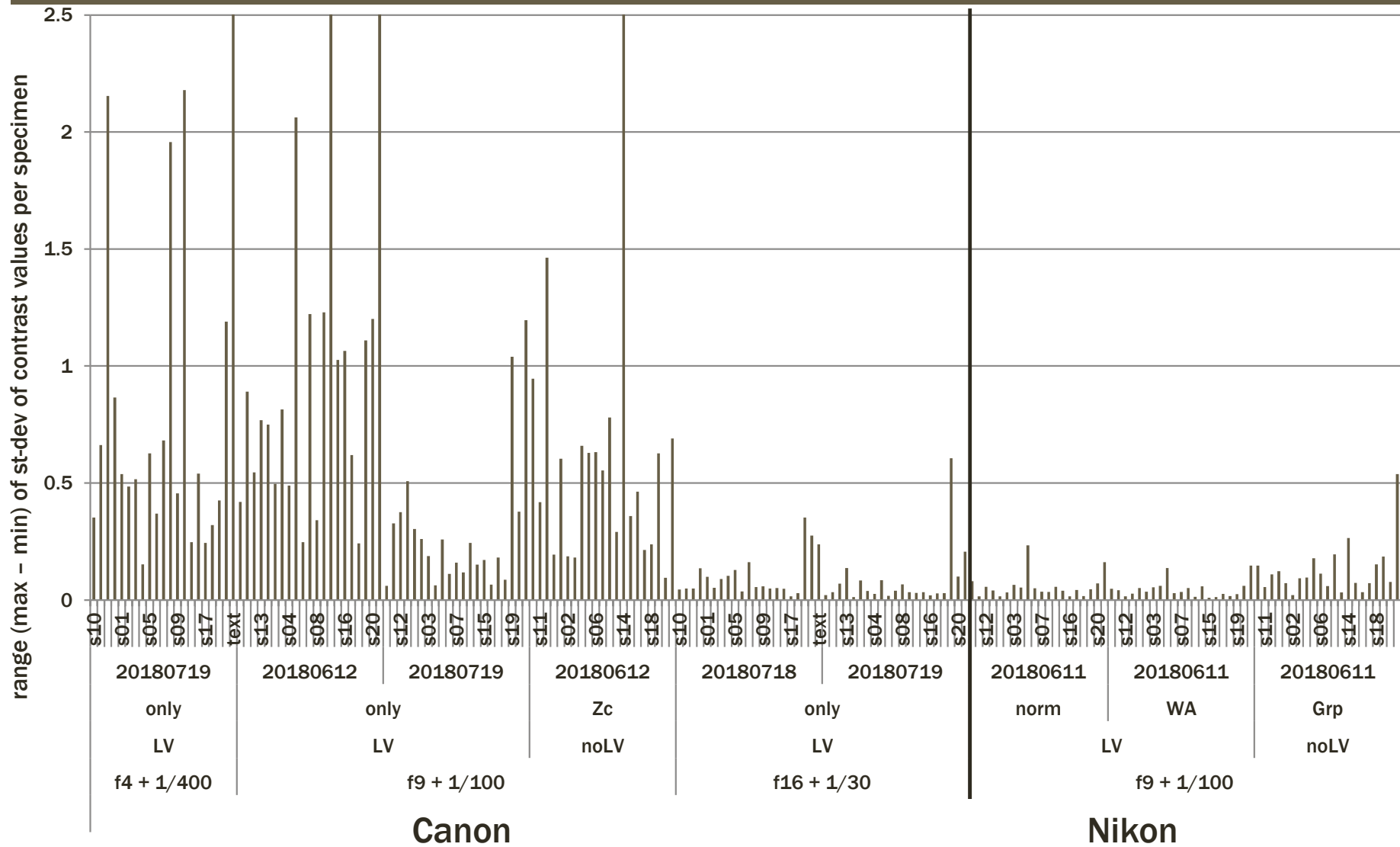
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A VIDEO DEMONSTRATION – by Michelle Mancini & Cindy Skema

F-STOP & FOCAL QUALITY



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