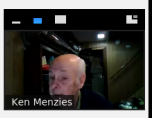
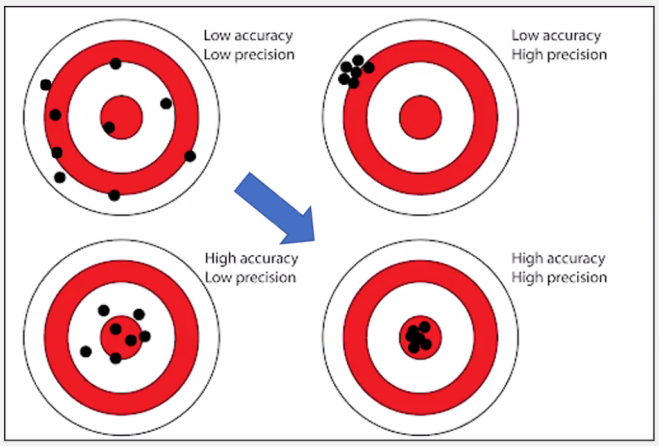
How “good” is my data?



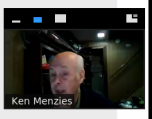
Unrepeatable
Unreliable
(± 1 mag) – 100% - Trivial)
± 0.1 mag – 10% - Easy

ACCURACY



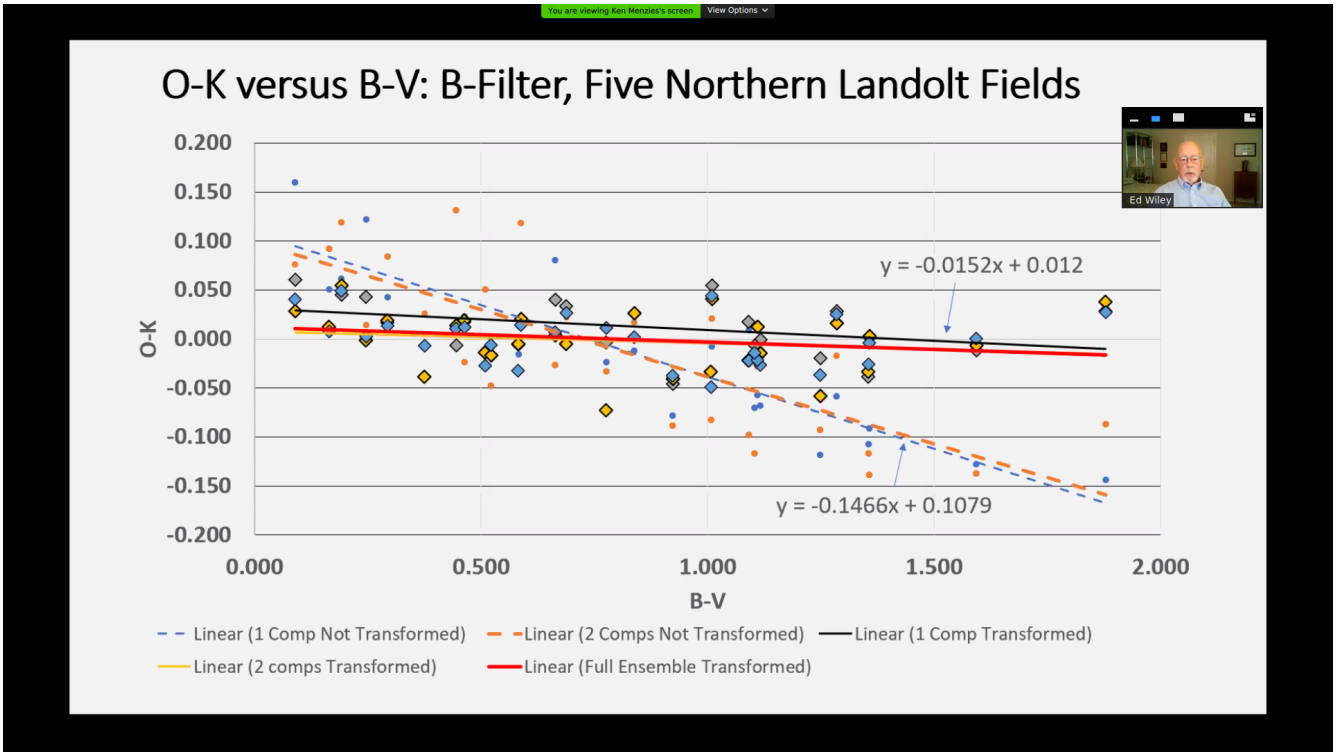
PRECISION

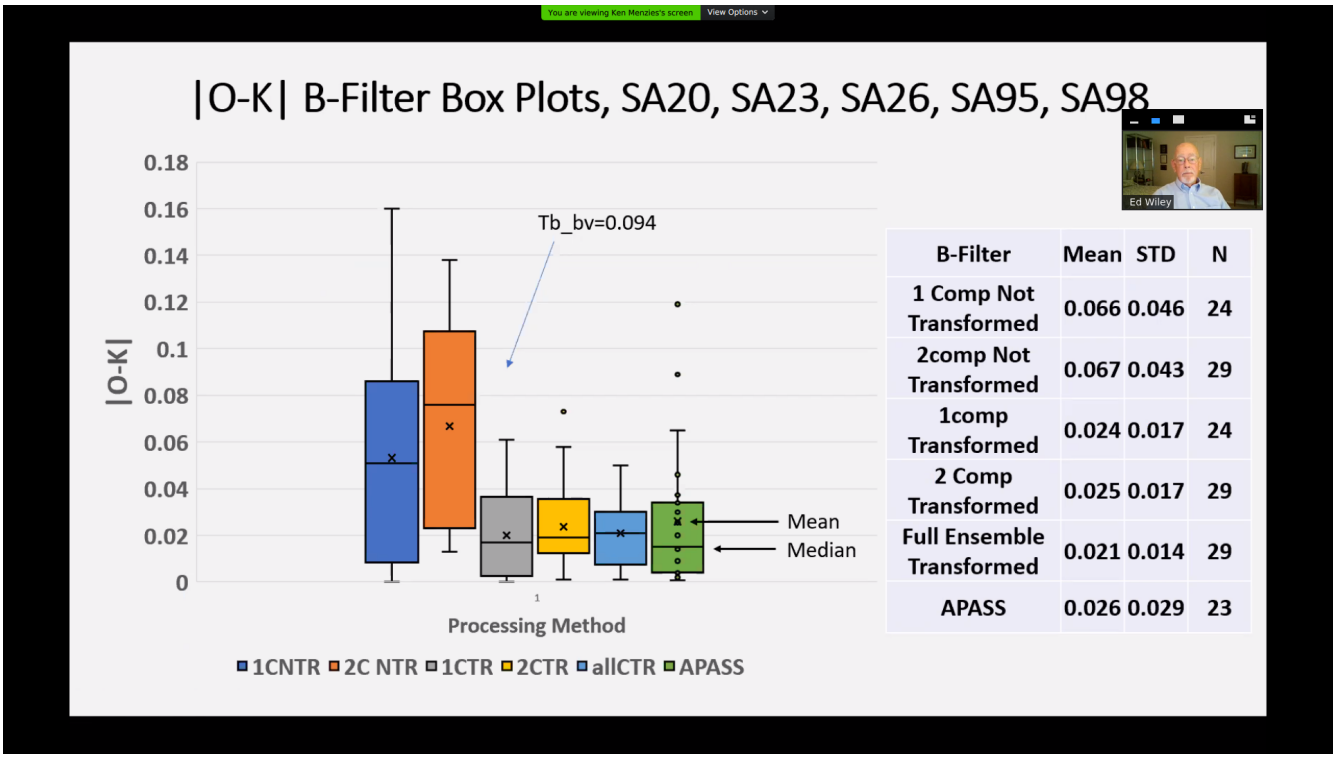
Repeatable
Reliable
± 0.01 mag -1% - Moderate
(± 0.001 mag - 0.1% - Difficult)



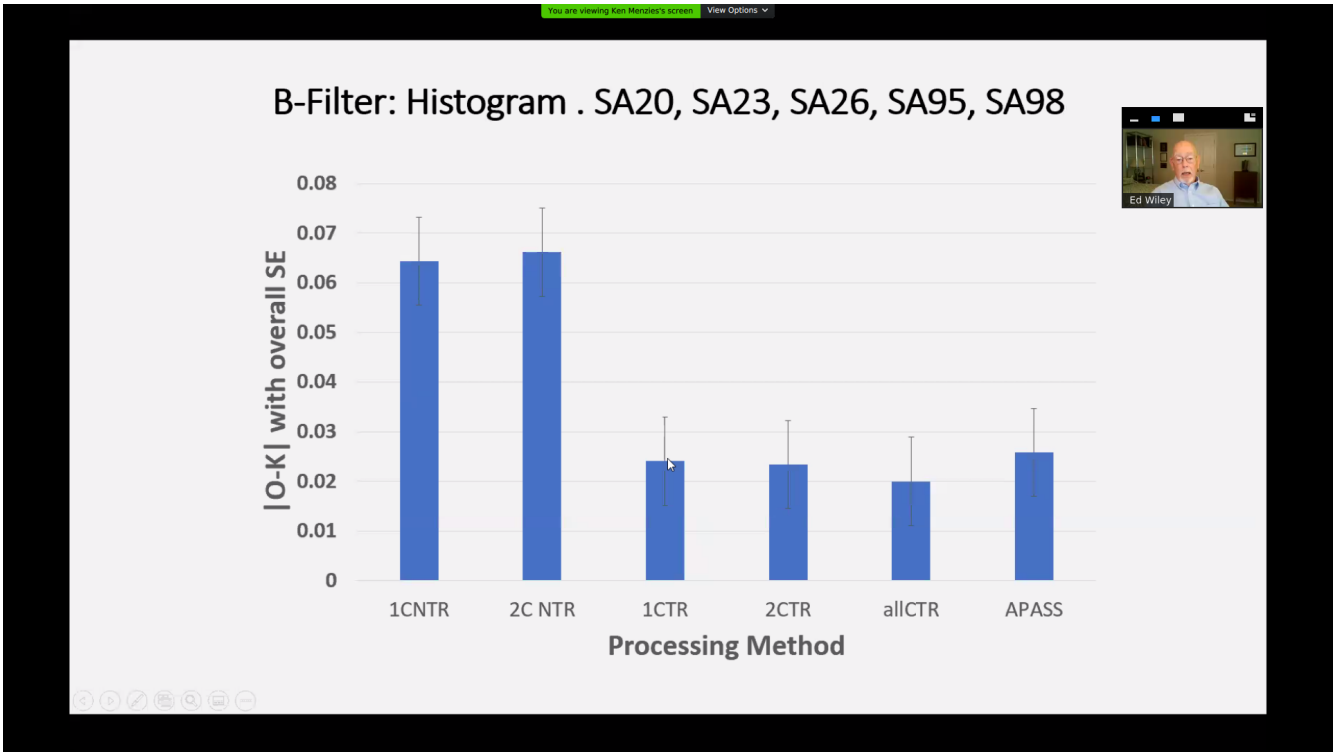
Data Acquisition

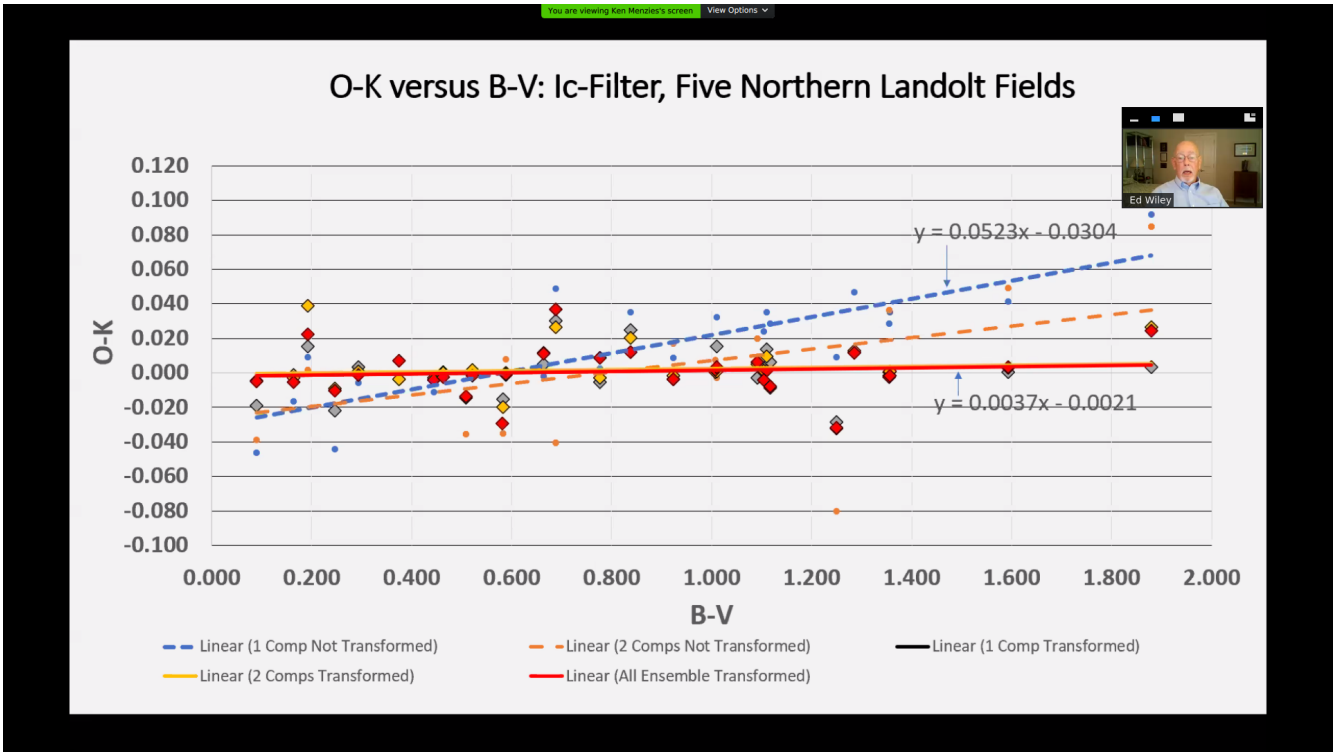
- Image Landolt Standard Fields NOT Variables
  - SA20, SA23, SA26, SA95, SA98, SA38
- 280mm SCT f/7, ST8300, BVI - Wiley
- 307mm HYP f/8, STL6303, BVRI – Menzies
- 180mm TAK f/2.8, ASI183, BVSRI – BSM_NH2
- Multiple Image Time Series (>7)
- Multiple Filters (BVRI)

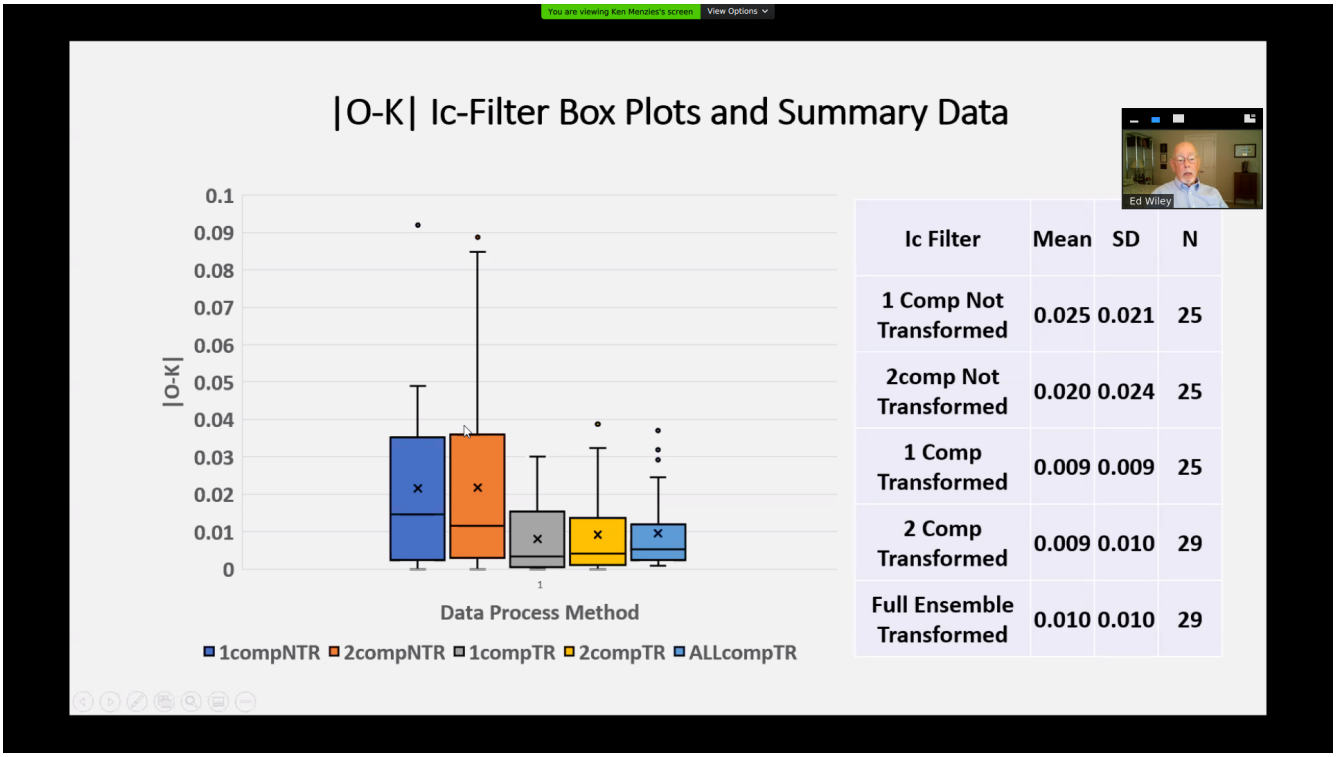




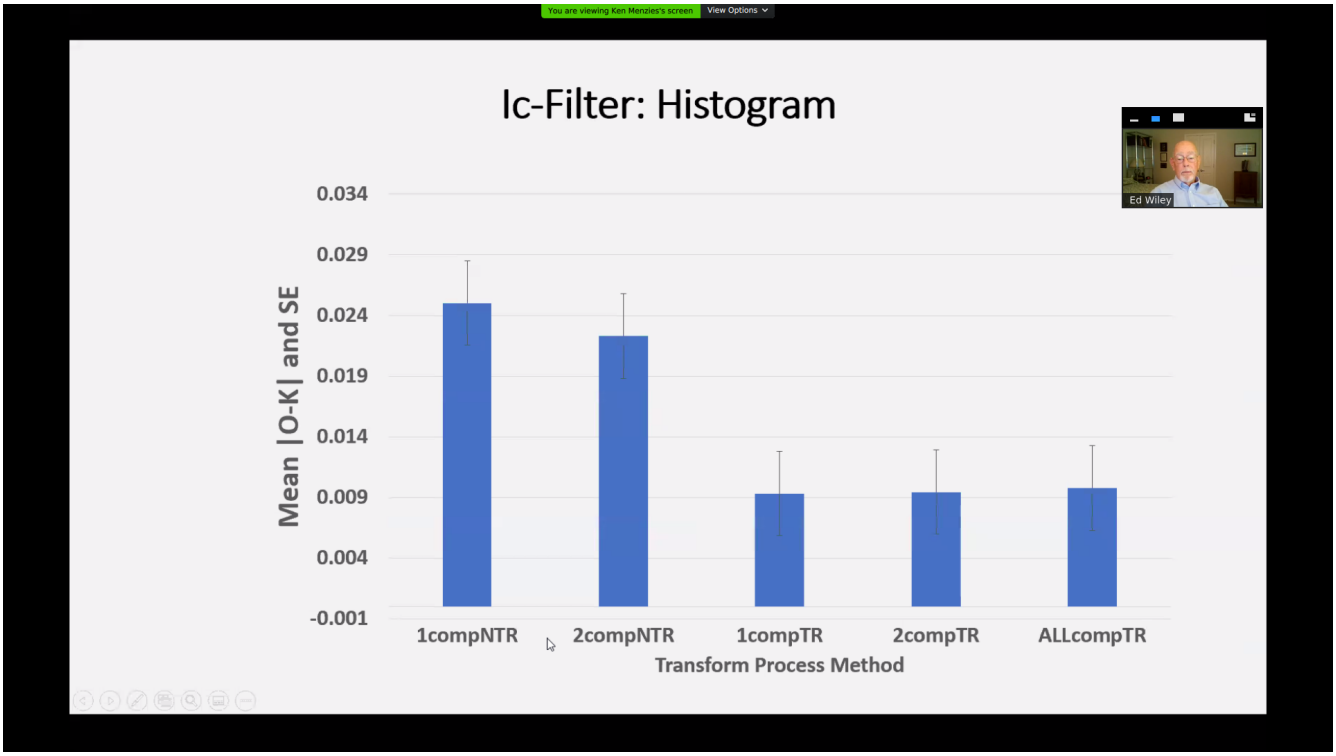
B-Filter	Mean	STD	N
1 Comp Not Transformed	0.066	0.046	24
2comp Not Transformed	0.067	0.043	29
1comp Transformed	0.024	0.017	24
2 Comp Transformed	0.025	0.017	29
Full Ensemble Transformed	0.021	0.014	29
APASS	0.026	0.029	23

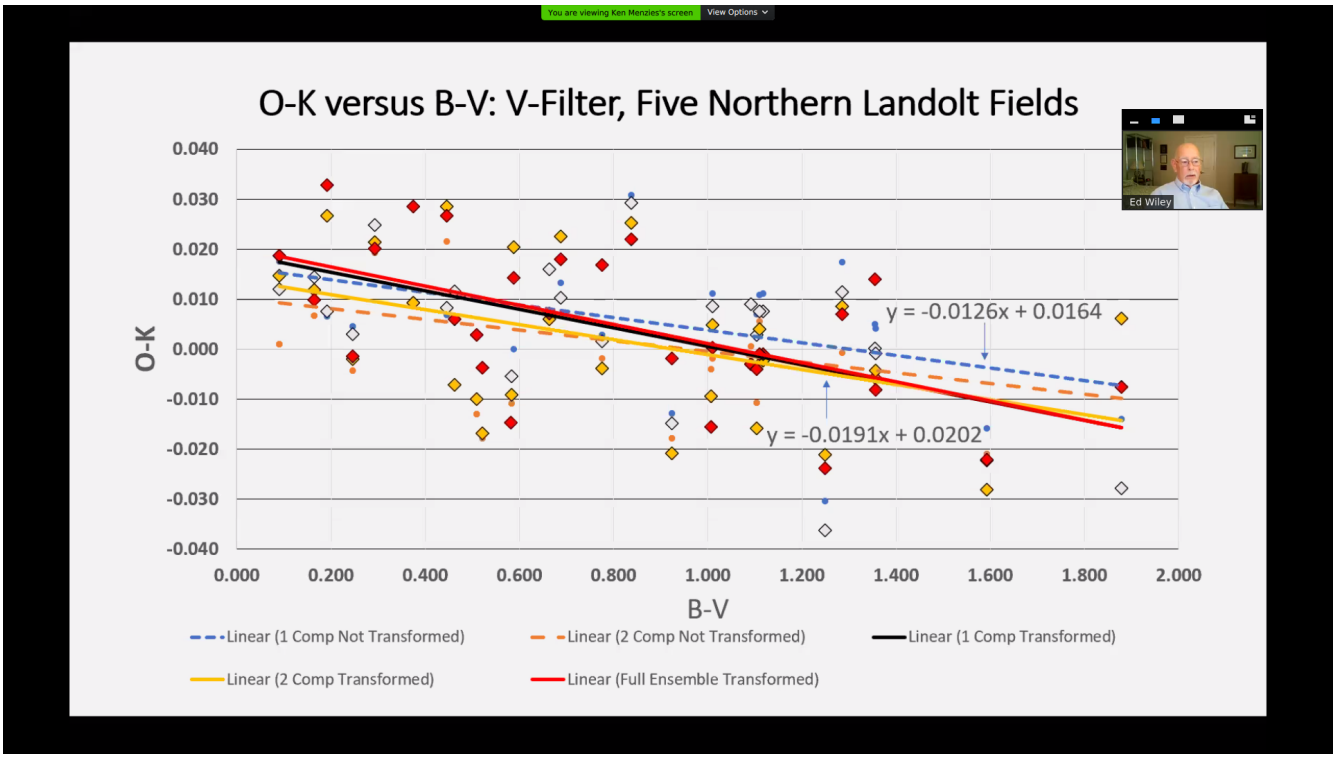

You are viewing Ken Menzies's screen
View Options
B-Filter: Histogram . SA20, SA23, SA26, SA95, SA98
Ed Wiley
|O-K| with overall SE
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1CNTR
2C NTR
1CTR
2CTR
allCTR
APASS
Processing Method



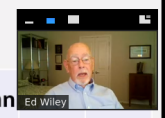


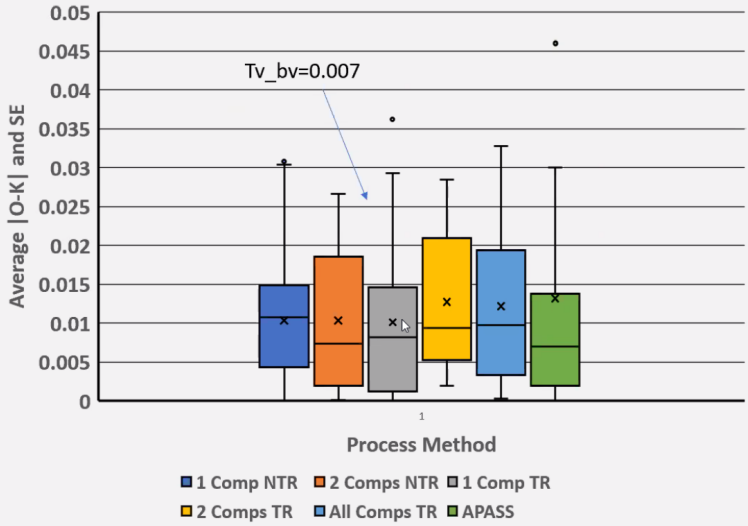
Ic Filter	Mean	SD	N
1 Comp Not Transformed	0.025	0.021	25
2comp Not Transformed	0.020	0.024	25
1 Comp Transformed	0.009	0.009	25
2 Comp Transformed	0.009	0.010	29
Full Ensemble Transformed	0.010	0.010	29


You are viewing Ken Menzies's screen
View Options
Ic-Filter: Histogram
Ed Wiley
Mean |O-K| and SE
0.034
0.029
0.024
0.019
0.014
0.009
0.004
-0.001
1compNTR
2compNTR
1compTR
2compTR
ALLcompTR
Transform Process Method


You are viewing Ken Menzies's screen
View Options
O-K versus B-V: V-Filter, Five Northern Landolt Fields
Ed Wiley
O-K
0.040
0.030
0.020
0.010
0.000
-0.010
-0.020
-0.030
-0.040
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
B-V
y = -0.0126x + 0.0164
y = -0.0191x + 0.0202
Linear (1 Comp Not Transformed)
Linear (2 Comp Not Transformed)
Linear (1 Comp Transformed)
Linear (2 Comp Transformed)
Linear (Full Ensemble Transformed)

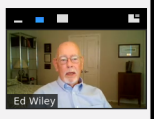
|O-K| V-Filter Box Plots

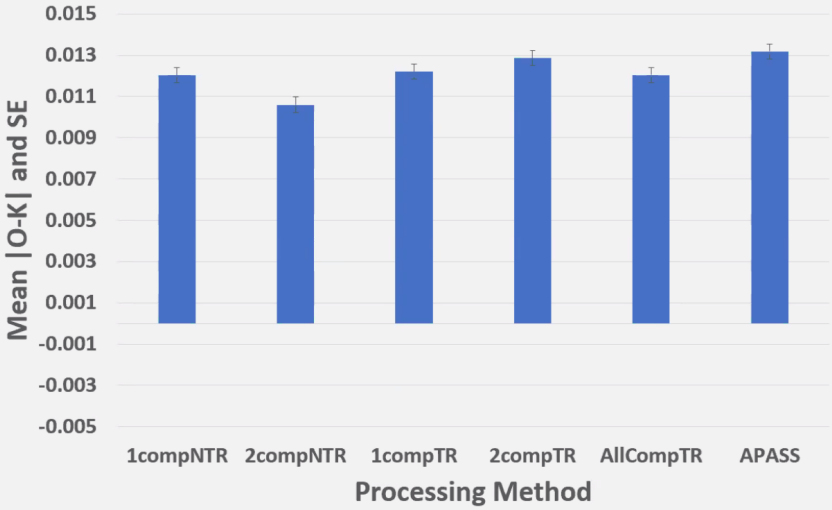


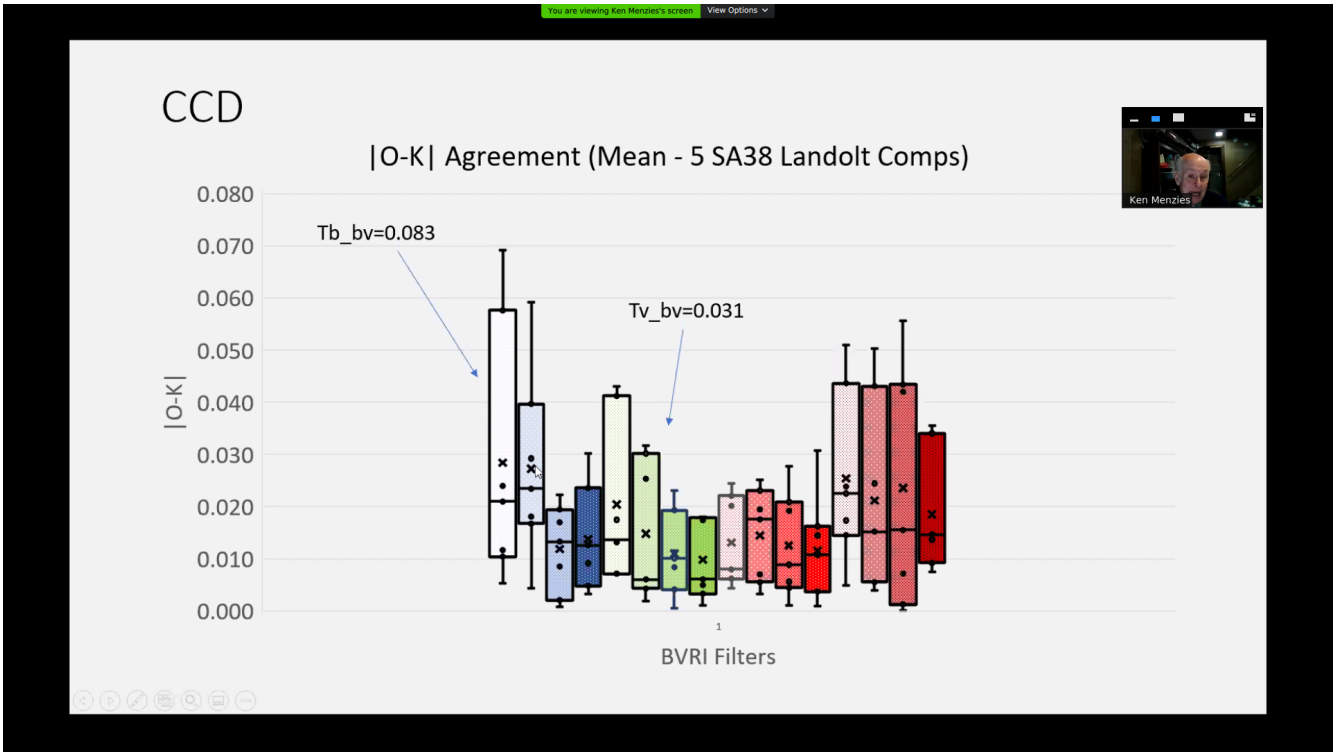


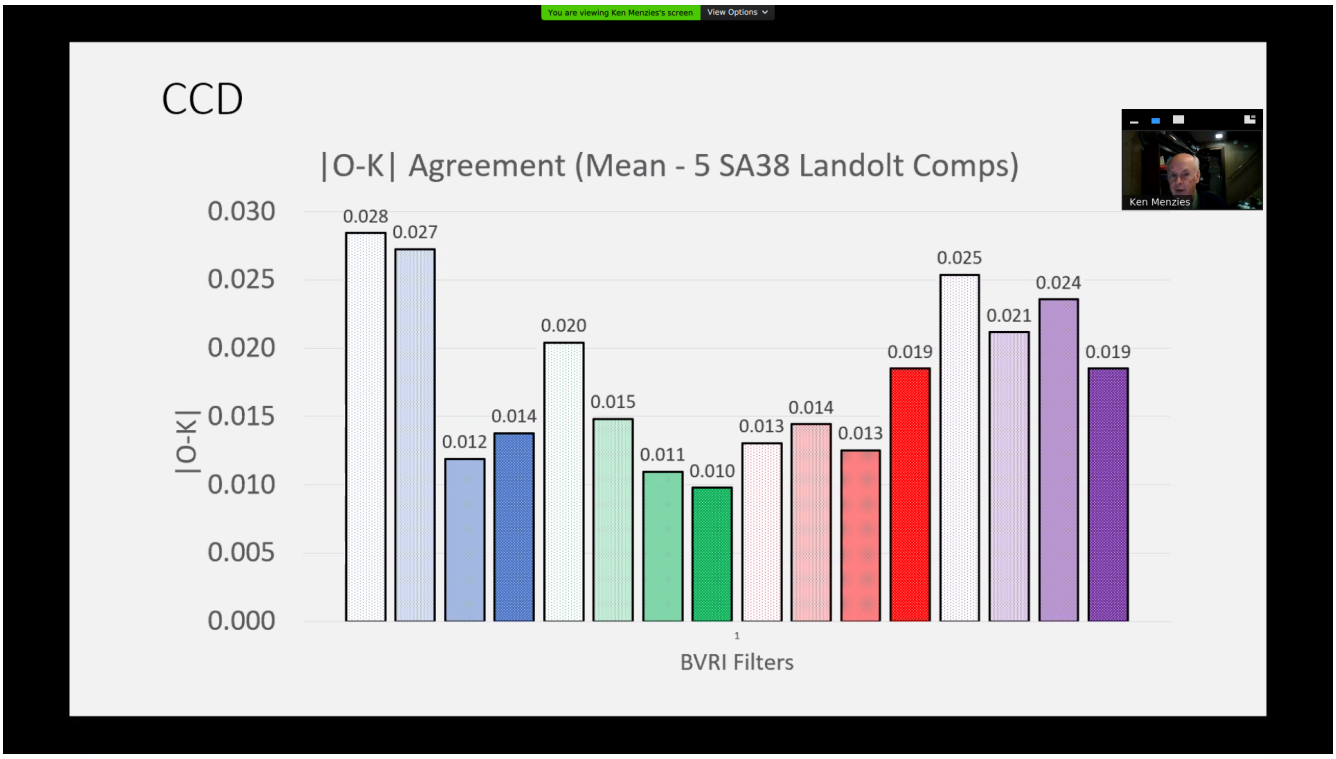
V Filter	Mean		
1 Comp Not Transformed	0.012	0.008	25
2 Comp Not Transformed	0.010	0.008	29
1 Comp Transformed	0.012	0.009	24
2 Comp Transformed	0.013	0.008	29
Full Ensemble Transformed	0.012	0.009	29
APASS	0.014	0.017	23

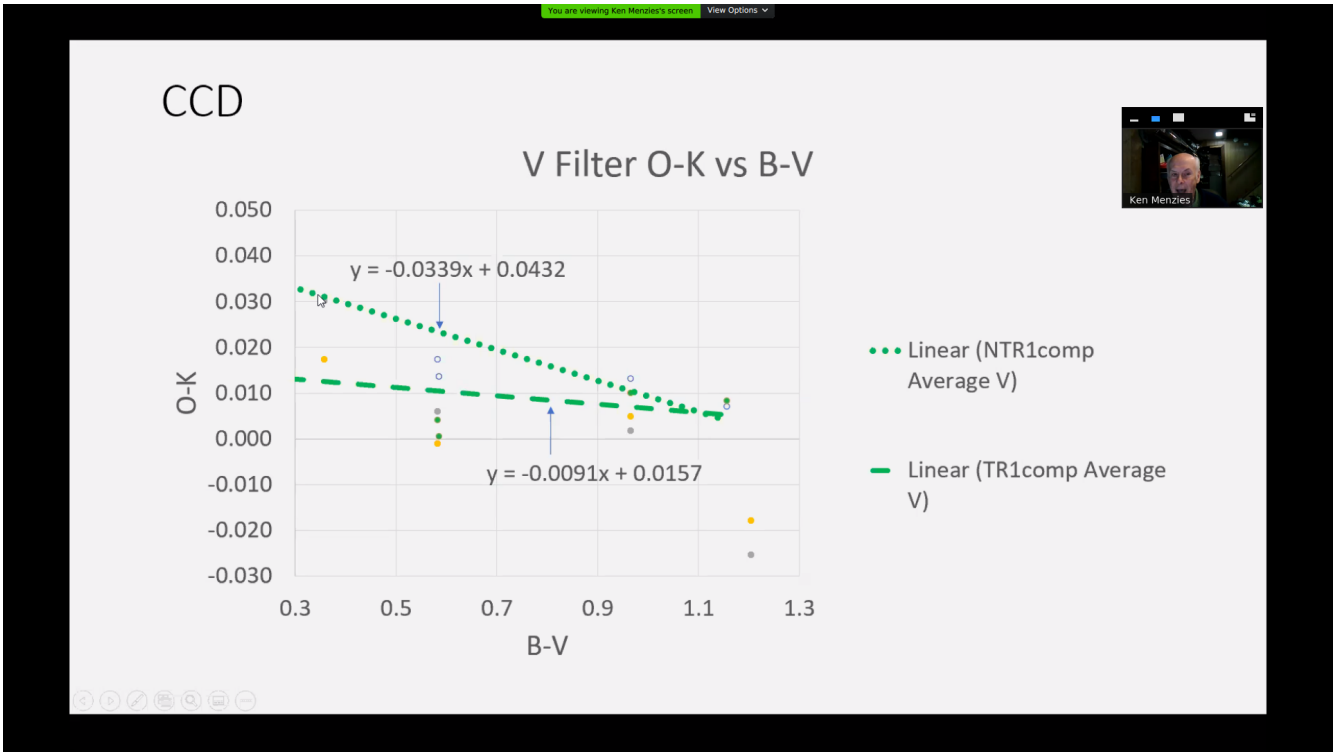
V-Filter: Histogram

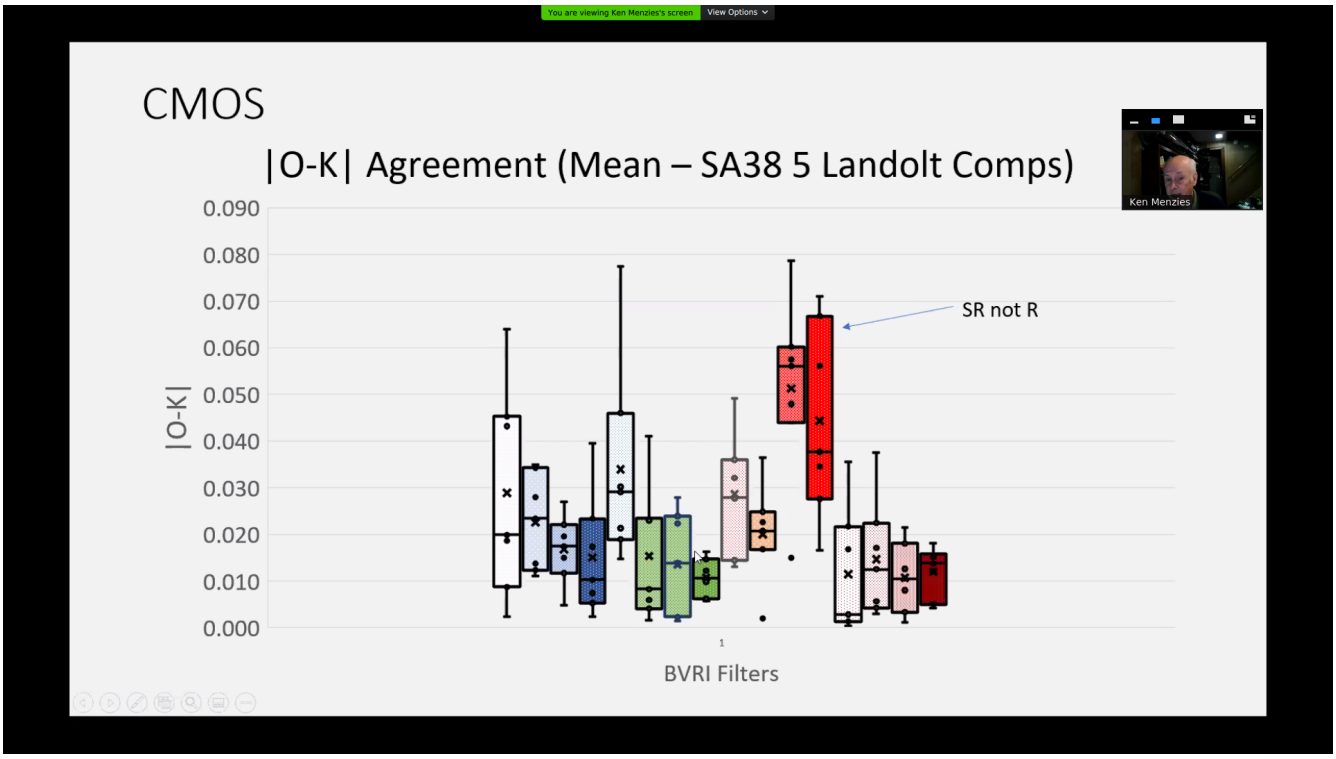


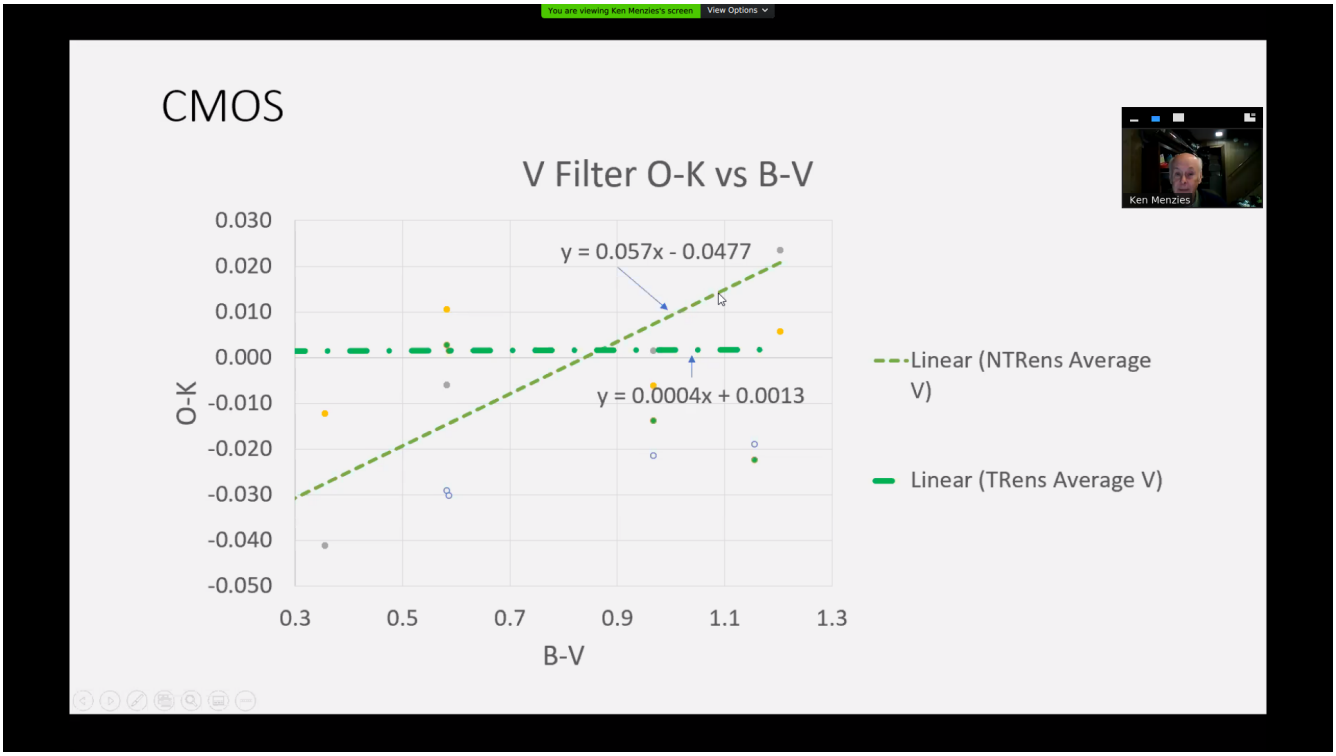


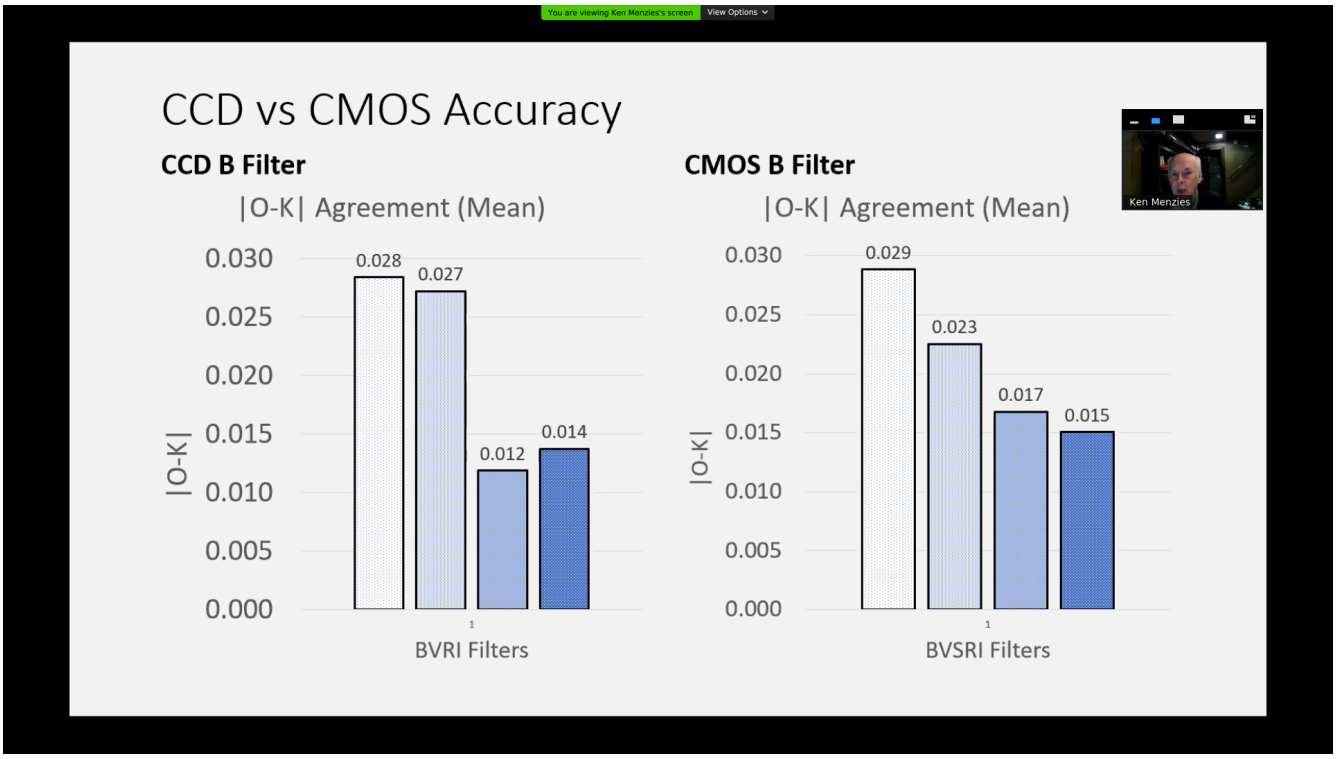

You are viewing Ken Menzies's screen
View Options
CCD
|O-K| Agreement (Mean - 5 SA38 Landolt Comps)
Ken Menzies
Tb_bv=0.083
Tv_bv=0.031
|O-K|
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
1
BVRI Filters


You are viewing Ken Menzies's screen
View Options
CCD
|O-K| Agreement (Mean - 5 SA38 Landolt Comps)
Ken Menzies
|O-K|
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.028
0.027
0.012
0.014
0.020
0.015
0.011
0.010
0.013
0.014
0.013
0.019
0.025
0.021
0.024
0.019
1
BVRI Filters

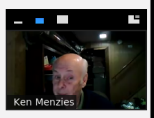

You are viewing Ken Menzies's screen
View Options
CCD
V Filter O-K vs B-V
Ken Menzies
0.050
0.040
0.030
0.020
0.010
0.000
-0.010
-0.020
-0.030
O-K
y = -0.0339x + 0.0432
y = -0.0091x + 0.0157
0.3
0.5
0.7
0.9
1.1
1.3
B-V
Linear (NTR1comp Average V)
Linear (TR1comp Average V)


You are viewing Ken Menzies's screen
View Options
CMOS
|O-K| Agreement (Mean – SA38 5 Landolt Comps)
Ken Menzies
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
|O-K|
SR not R
1
BVRI Filters

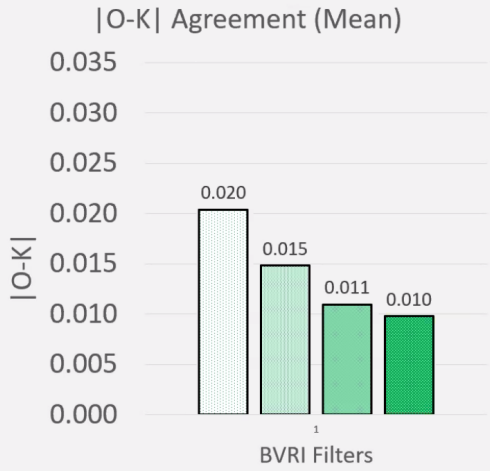

You are viewing Ken Menzies's screen
View Options
CMOS
V Filter O-K vs B-V
y = 0.057x - 0.0477
y = 0.0004x + 0.0013
O-K
B-V
0.030
0.020
0.010
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
0.3
0.5
0.7
0.9
1.1
1.3
Linear (NTRens Average V)
Linear (TRens Average V)
Ken Menzies


You are viewing Ken Menzies's screen
View Options
CCD vs CMOS Accuracy
CCD B Filter
|O-K| Agreement (Mean)
|O-K|
0.028
0.027
0.012
0.014
BVRI Filters
CMOS B Filter
|O-K| Agreement (Mean)
|O-K|
0.029
0.023
0.017
0.015
BVSRI Filters
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Ken Menzies

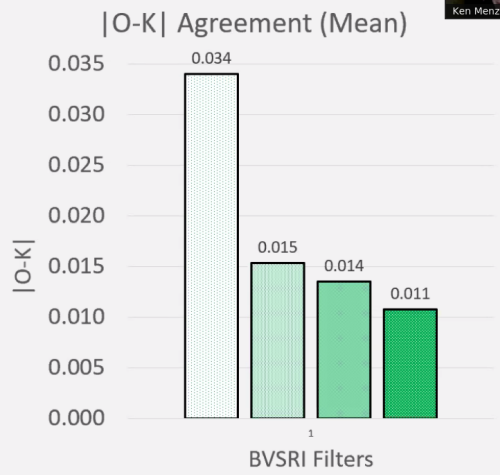
CCD vs CMOS Accuracy



CCD V

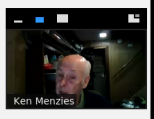


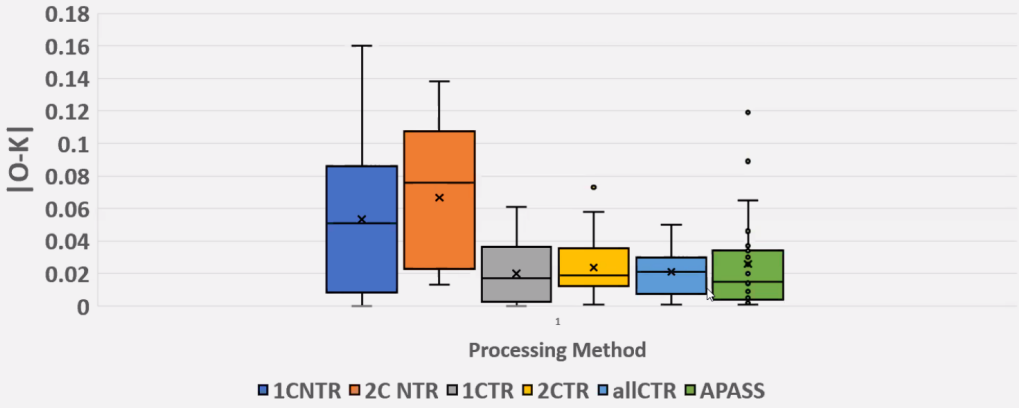
CMOS V



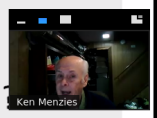
Precision and Accuracy Improvement

(Multiple SA Fields)





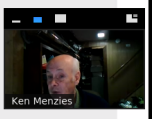
You are viewing Ken Menzies's screen
View Options



Precision Improvement Order

- How can I improve my Data Precision?
  - Single Comp – Non-Transformed
  - Ensemble Comps – Non-Transformed
  - Single Comp – Transformed
  - Ensemble Comps – Transformed

You are viewing Ken Menzies's screen
View Options



How Much Improvement?

- Possible Accuracy (approximate)
  - Single Comp – Non-Transformed (<0.1)?
  - Ensemble Comps – Non-Transformed (<0.05)?
  - Single Comp – Transformed (<0.03)?
  - Ensemble Comps – Transformed (<0.01)?