MOIRCS J2/H2/K2 Triple-Band Filter

Company Measurement by Asahi Bunkou, Co.

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Report by Ichi Tanaka

Asahi-Bunkou J2H2K2 Triple Medium-Bands Filter Specification Review

[Optical Specification for each band]

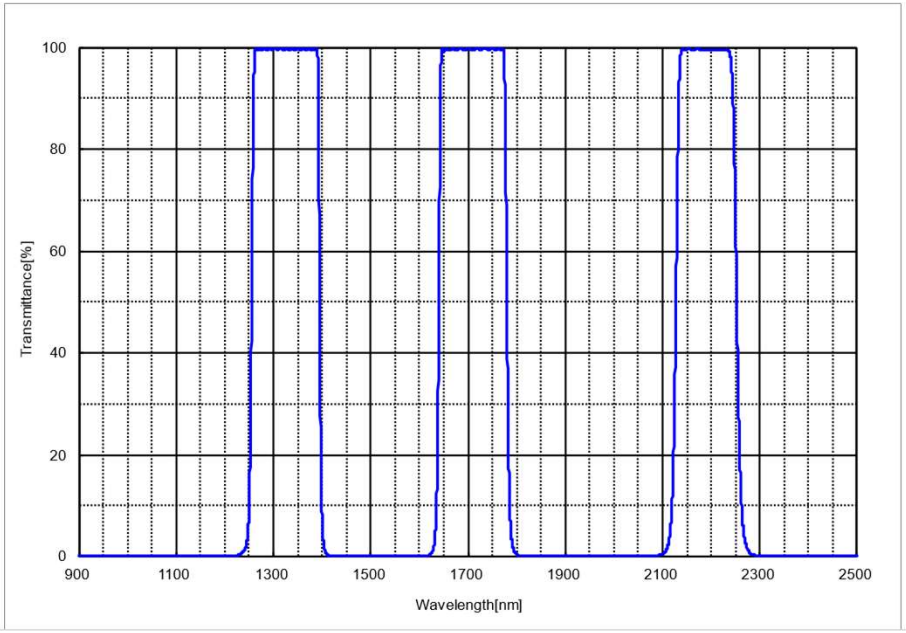
J2:
Center wavelength : 1325.0 nm
Cut-on wavelength : 1255.0 nm
Cut-off wavelength : 1395.0 nm

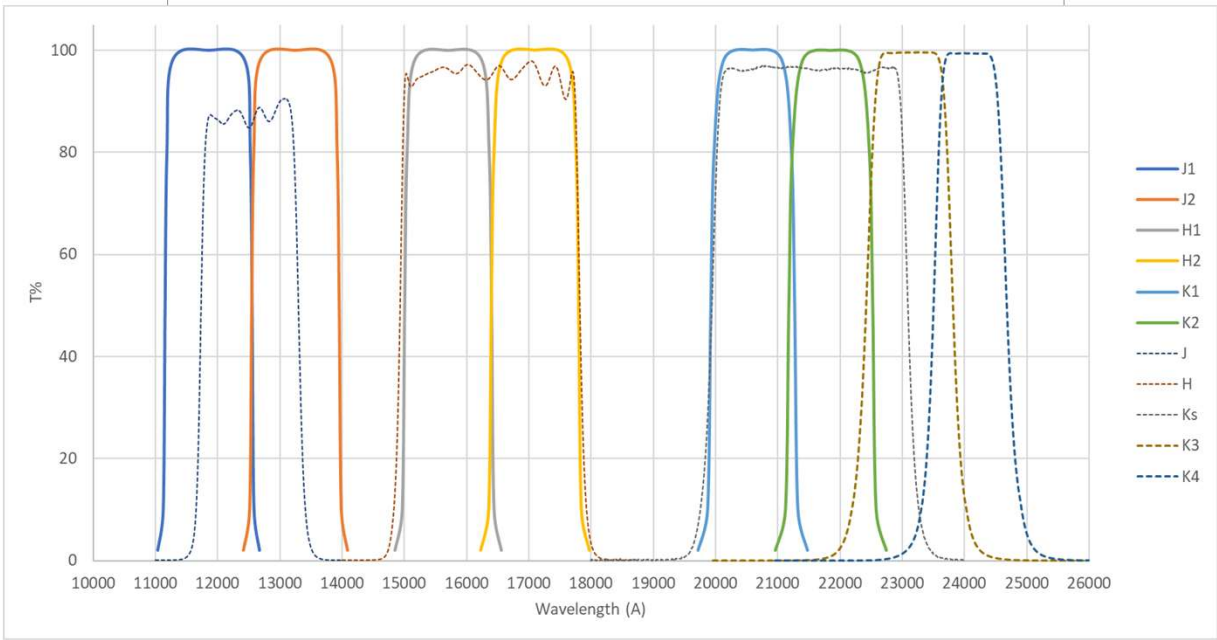
H2:
Center wavelength : 1710.0 nm
Cut-on wavelength : 1640.0 nm
Cut-off wavelength : 1780.0 nm

K2:
Center wavelength : 2185.0 nm
Cut-on wavelength : 2117.5 nm
Cut-off wavelength : 2252.5 nm

Cut-on/off
Acceptance Condition +/-0.7%
Goal +/-0.5%
for each cut-on/off wavelengths.

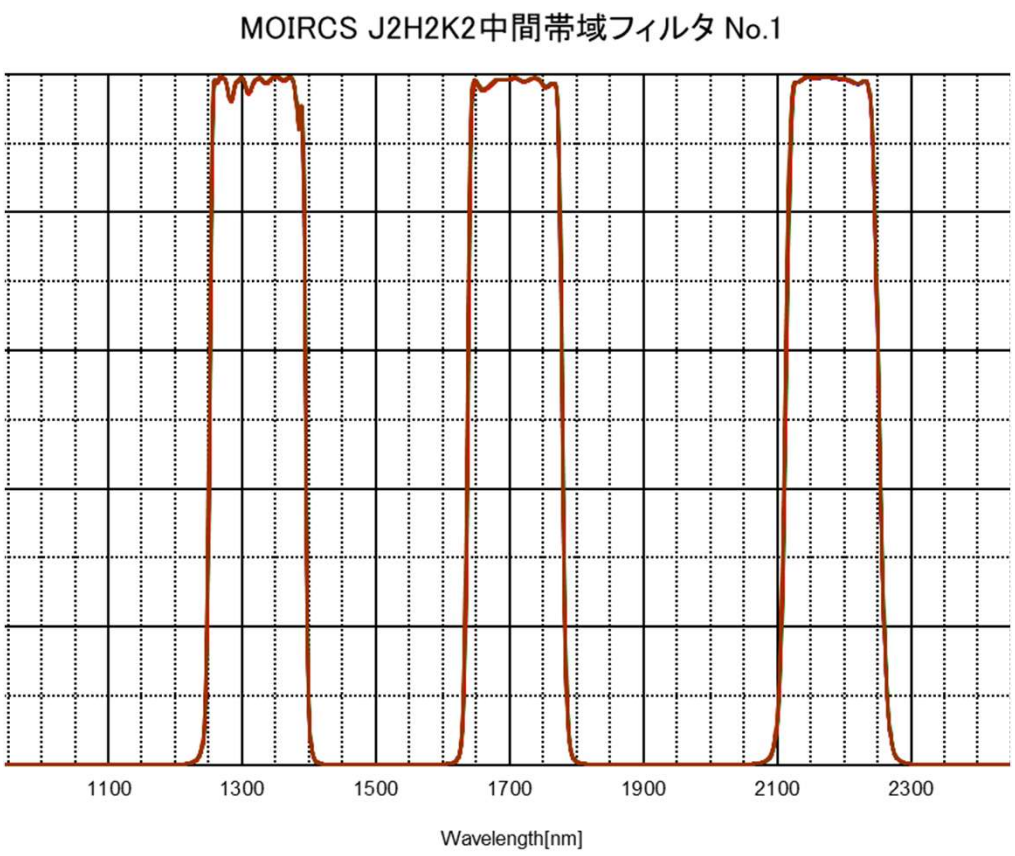
Out of band blocking (Average):
<0.01% (900-2500 nm)

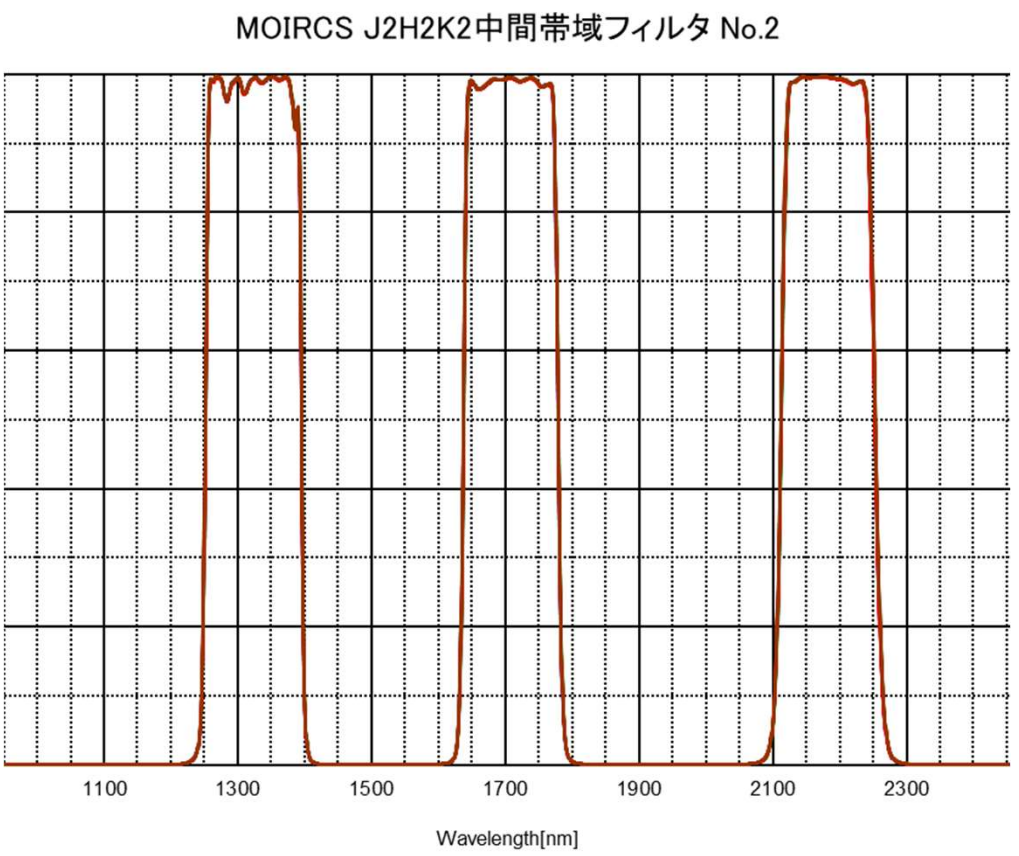




Asahi-Bunkou J2H2K2 Triple Medium-Bands Filter No.1/2

T% in a paralell beam at AOI 0 deg / 296K





Difference is so small among two filters that we cannot distinguish them.

Cut-On/Off Performance

[Optical Specification for each band]

J2:
Center wavelength : 1325.0 nm
Cut-on wavelength : 1255.0 nm
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Cut-on wavelength : 2117.5 nm
Cut-off wavelength : 2252.5 nm

[Cut-On/OFF under 120K, AoI=5deg (for MOIRCS)]

Cut-On wavelength for J2: 1250.55 - 1.6 - 0.96 = 1247.99nm (-7.01nm)

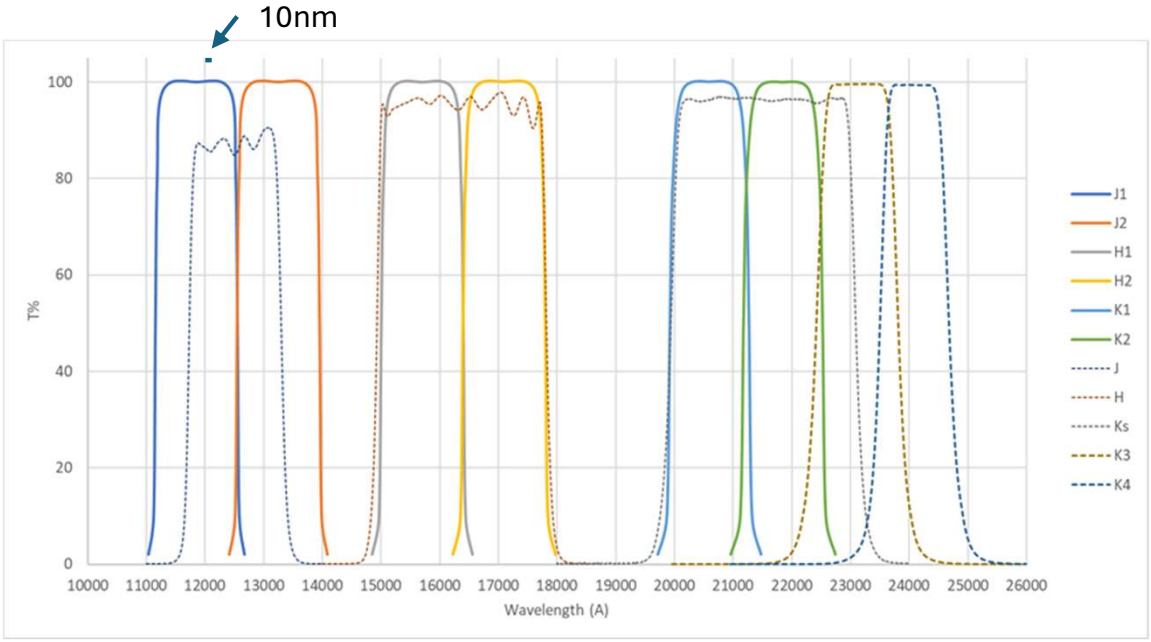
Cut-Off wavelength for J2: 1397.74 - 1.7 - 1.52 = 1394.52nm (-0.48nm)

Cut-On wavelength for H2: 1636.49 - 2.1 - 1.45 = 1632.94nm (-7.06nm)

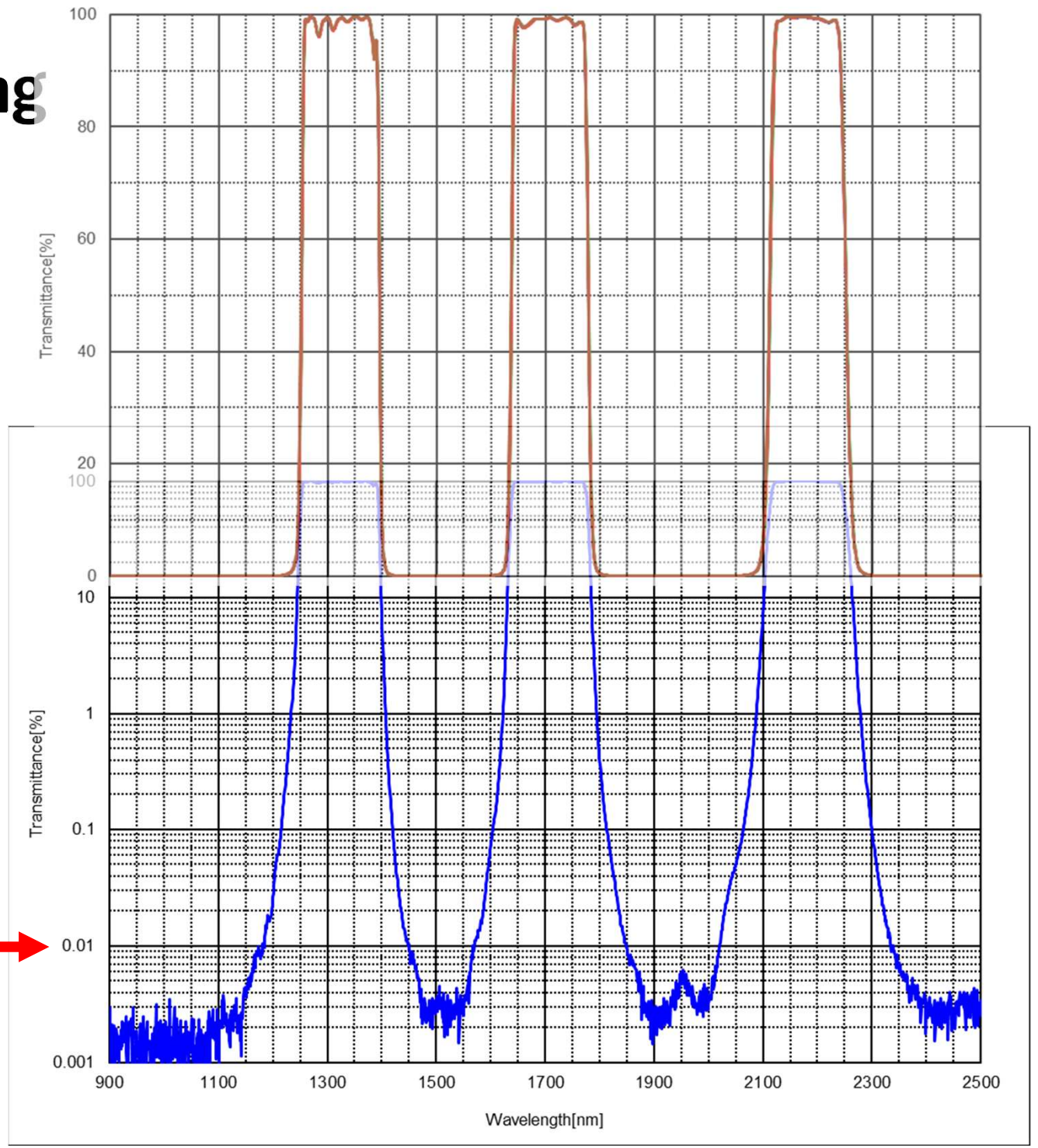
Cut-Off wavelength for H2: 1778.53 - 2.3 - 1.69 = 1774.54nm (-5.46nm)

Cut-On wavelength for K2: 2111.13 - 2.6 - 1.71 = 2106.82nm (-10.68nm)

Cut-On wavelength for K2: 2252.63 - 2.9 - 2.48 = 2247.25nm (-5.25nm)

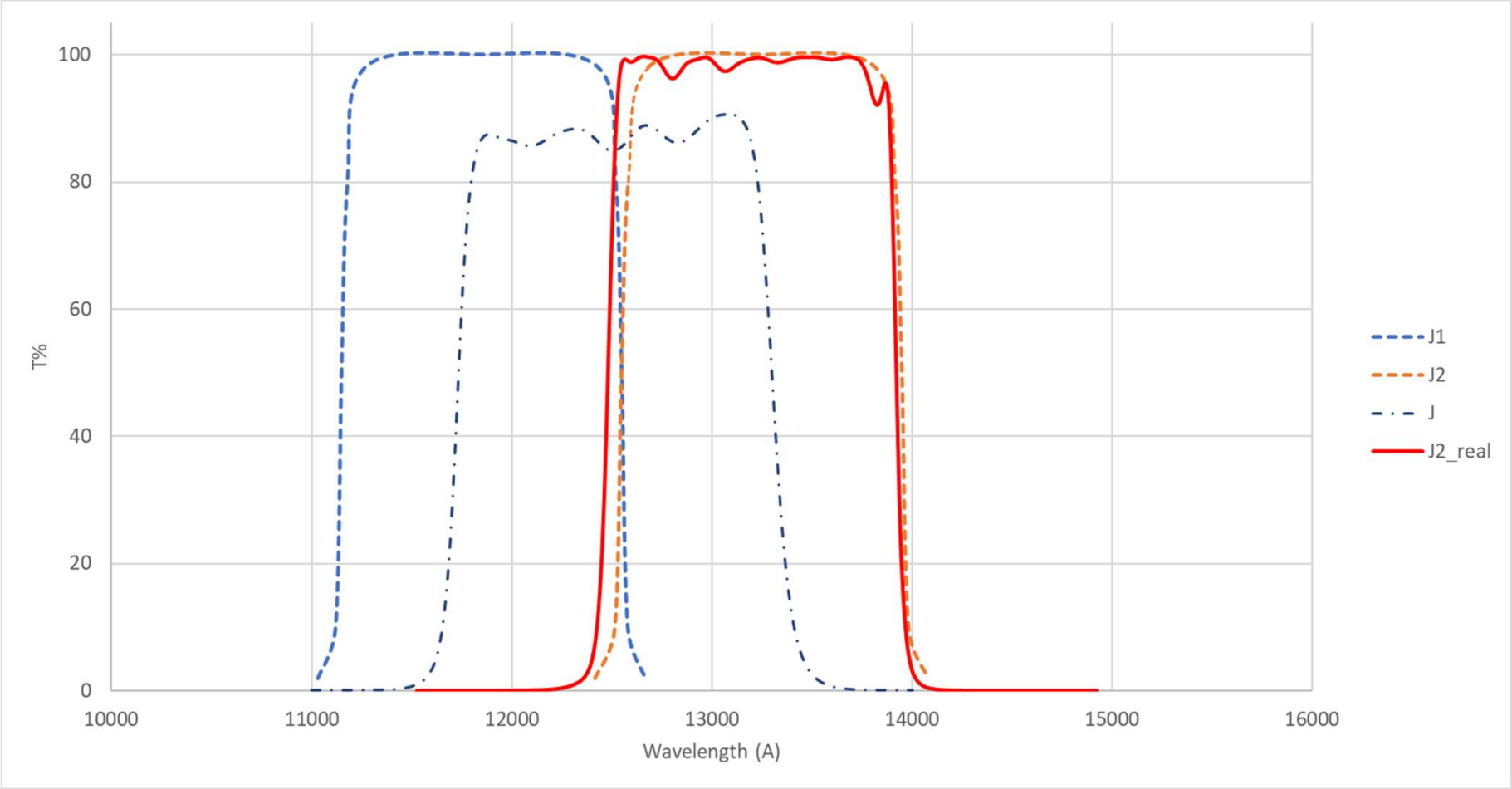


Off-band Blocking

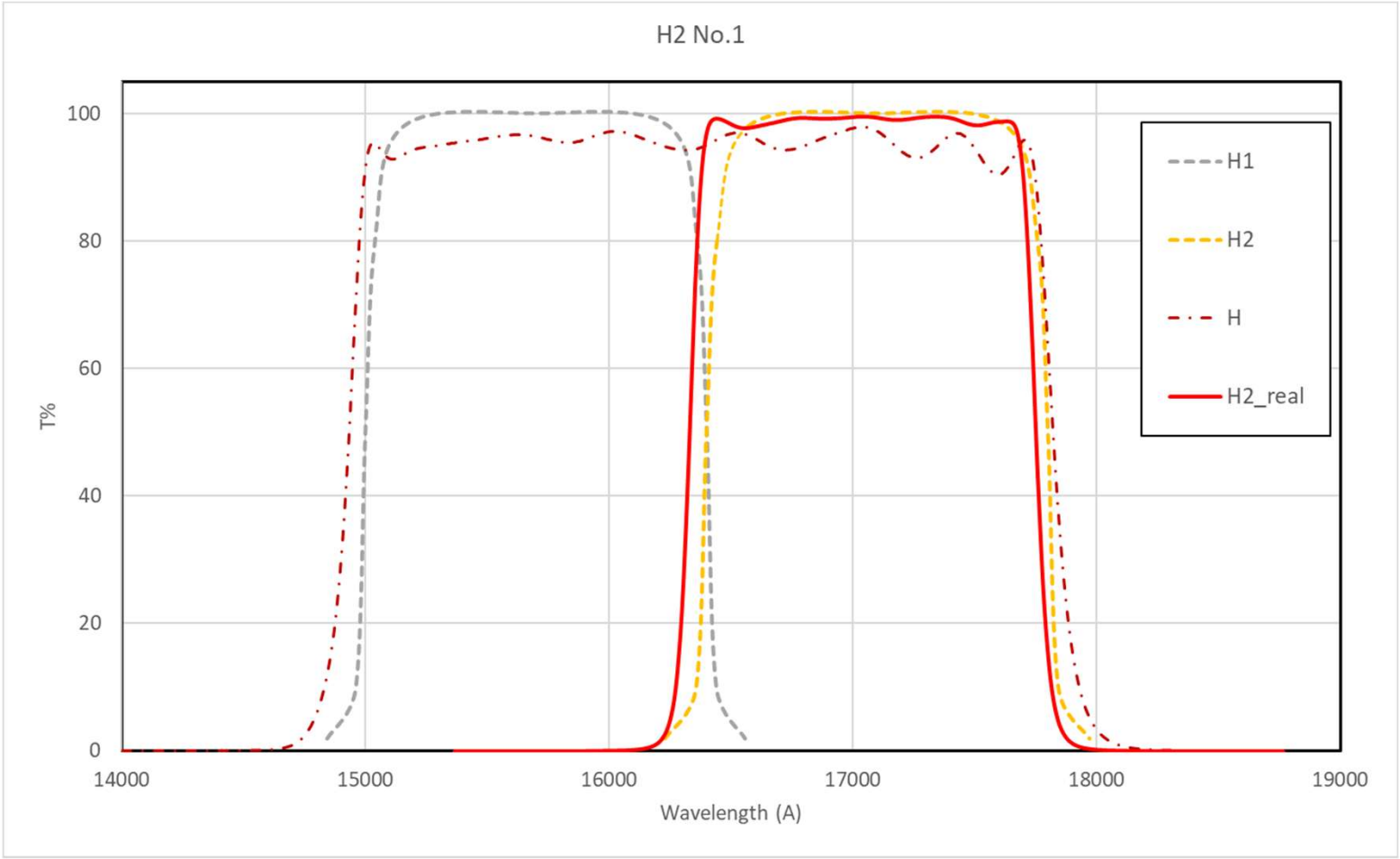


1E-4!

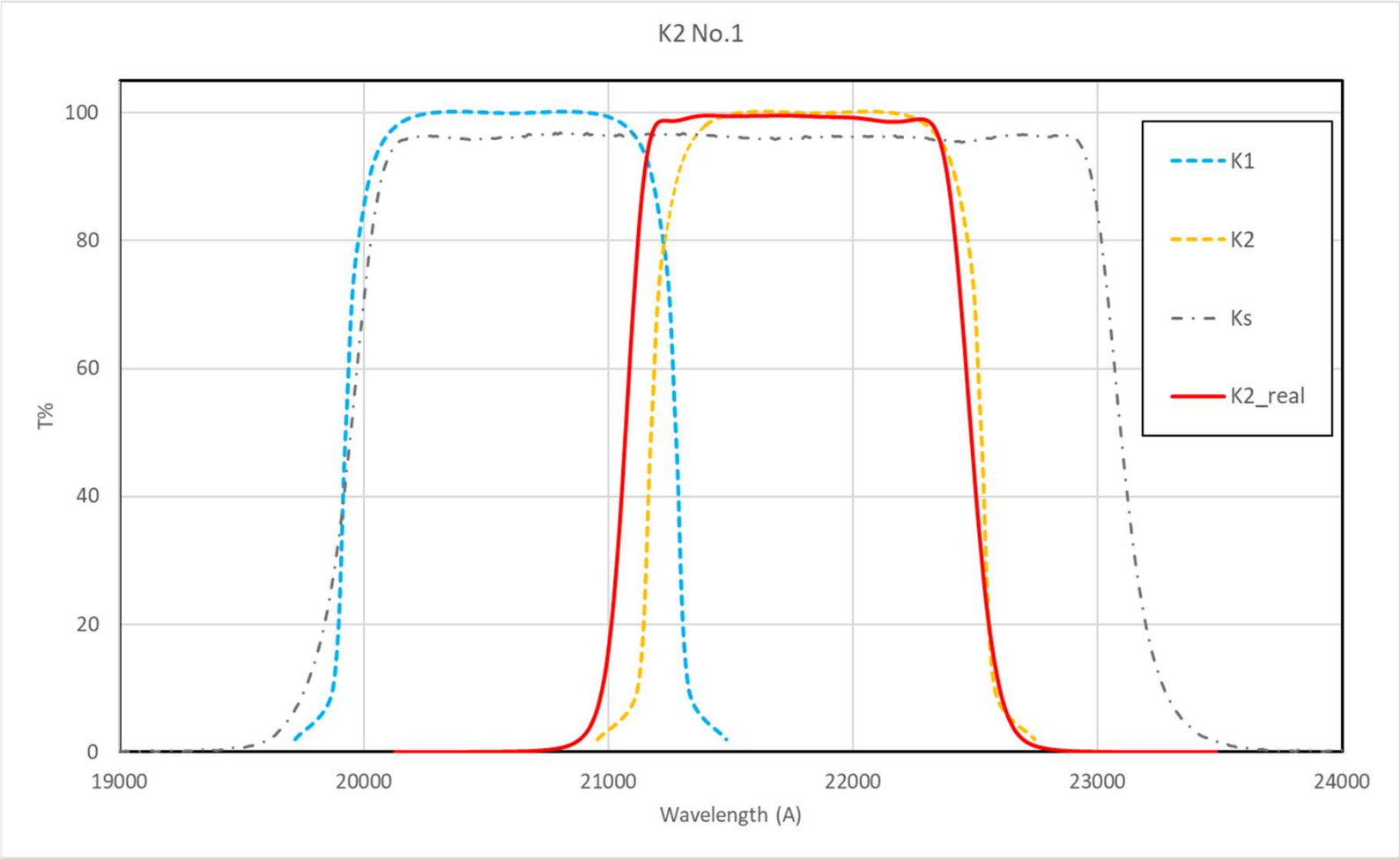
J2 Window


100
80
60
40
20
0
T%
10000
11000
12000
13000
14000
15000
16000
Wavelength (A)
J1
J2
J
J2_real

H2 Window


H2 No.1
100
80
60
40
20
0
T%
14000
15000
16000
17000
18000
19000
Wavelength (A)
H1
H2
H
H2_real

K2 Window

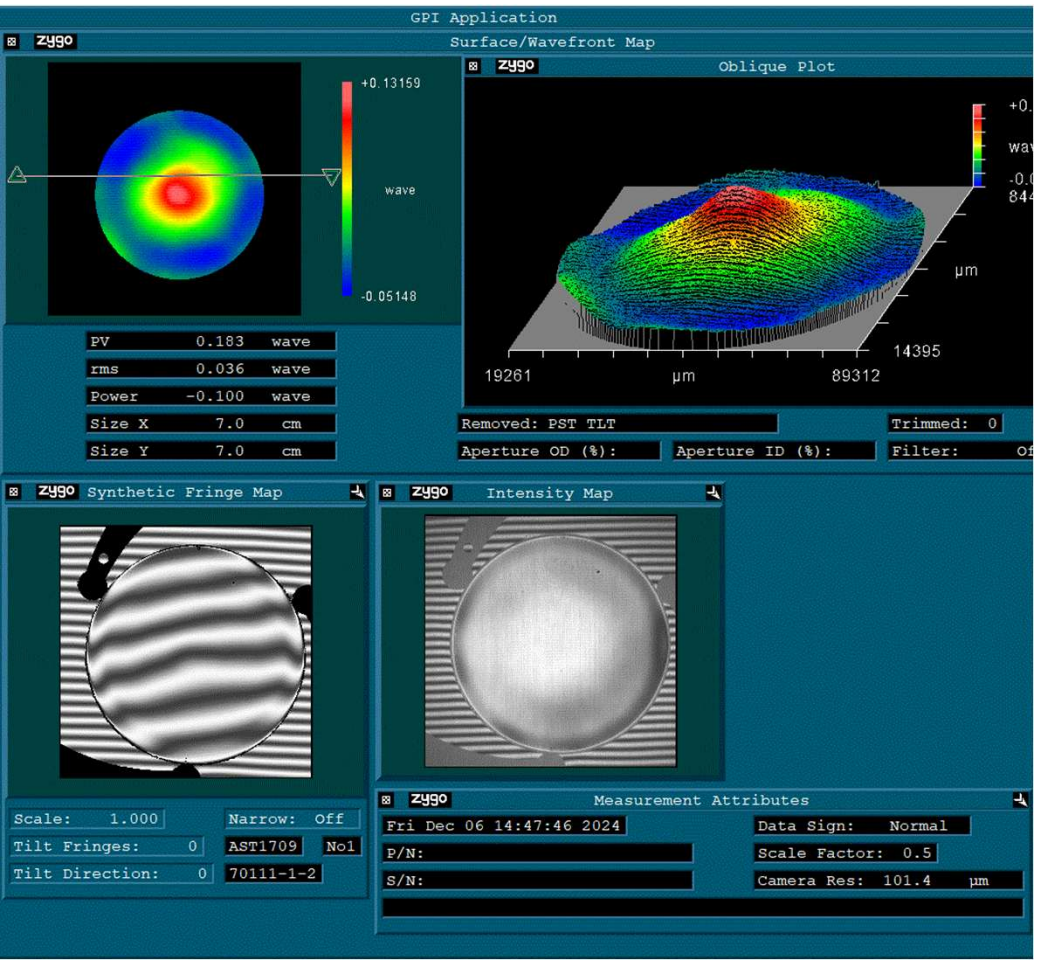

K2 No.1
100
80
60
40
20
0
T%
19000
20000
21000
22000
23000
24000
Wavelength (A)
K1
K2
Ks
K2_real

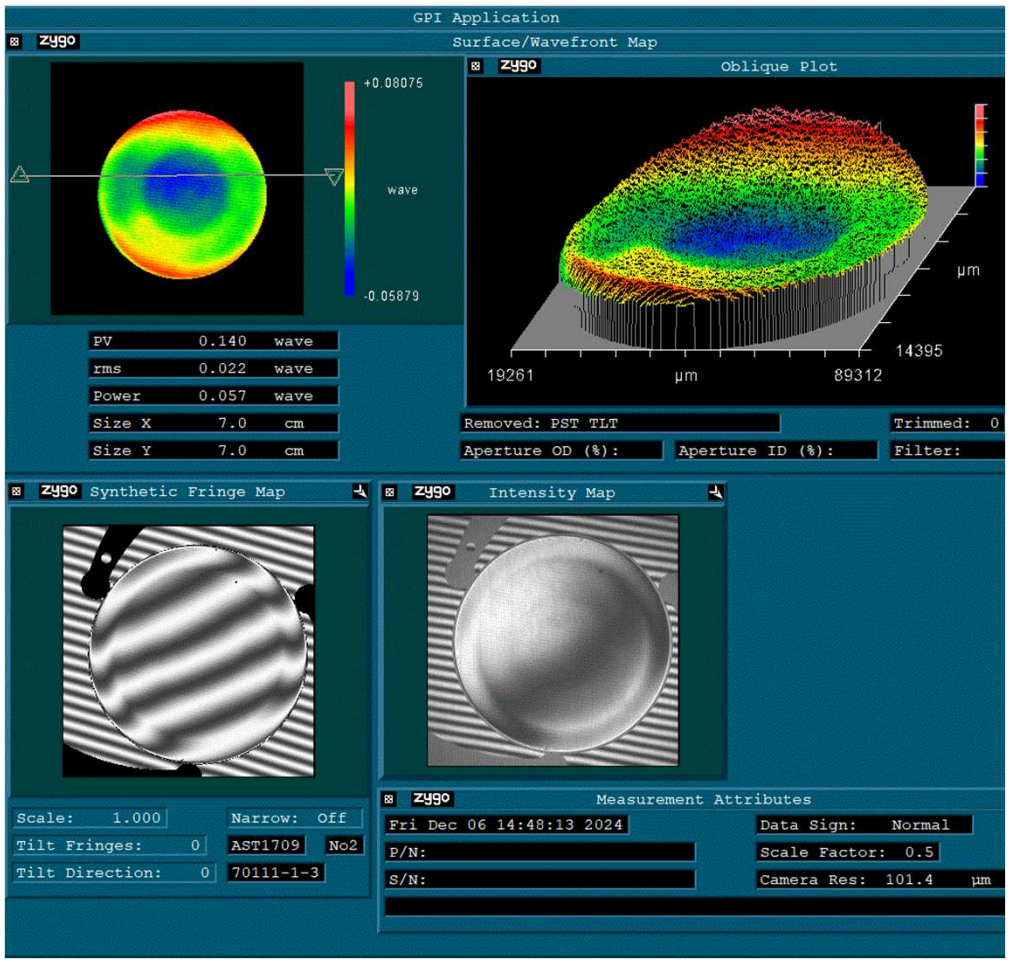
Substrates

Wedge angle of substrate
No.1: 41 arcsec
No.2: 38 arcsec

基板中心よりϕ70mmの範囲において
No.1: p-v 0.183 wave
No.2: p-v 0.140 wave
wave: 632.8nm

どちらもp-v λ/5以下の値を示しています。





Summary

- All satisfies the specification.
- There is a slight tendency for cut-ons to escape to the blue side, but this is within specifications and is not a problem at all in practical use.
- Ripples are also reasonably small.
- Peak sensitivity is superb, reaching nearly 95-100%.
- The out-of-band blocking is also very excellent at 1E-4 and in accordance with specifications.

- We should find budget source for J1H1K1 sooner.