# NIRPS Transmission/Efficiency

Original:
effs.txt – original file from Bruno Canto ETC
(190740, 33) with columns:

- Wavelength
- Tel_clean
- Fiber-end
- Back-End
- H4RG
- HA (with different columns for seeing equal to 0.7, 0.9, 1.2 paired I equal to 9 through 12)
- HE (with different columns for seeing equal to 0.7, 0.9, 1.2 paired I equal to 9 through 12)
- Blaze
- Order

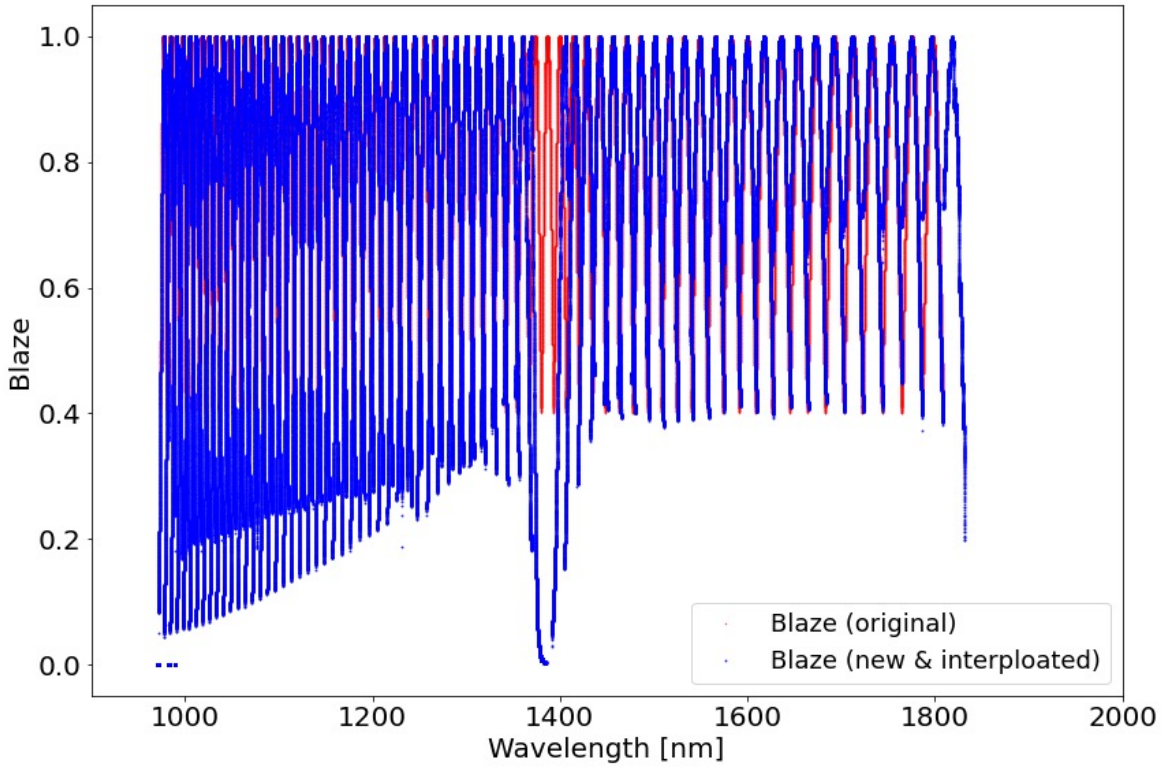
New:
NIRPS-3000-GEN-RP-108_3.4_NIRPS_Transmission_Budget
(up to date, "as built") by François Wildi
Excel File with tabs showing transmission for:

- Atmospheric transmittance from TAPAS model (same as old ETC)
- Telescope transmission (clean and dirty)
- Front-end (with mirror and from FP1) – WFS wavelength range
- Fiber throughput HA fiber
- Fiber throughput HE fiber
- Backend (YJH spectrometer)
- H4RG QE
- DM241
- Fiber coupling HA & HE for Imag vs seeing

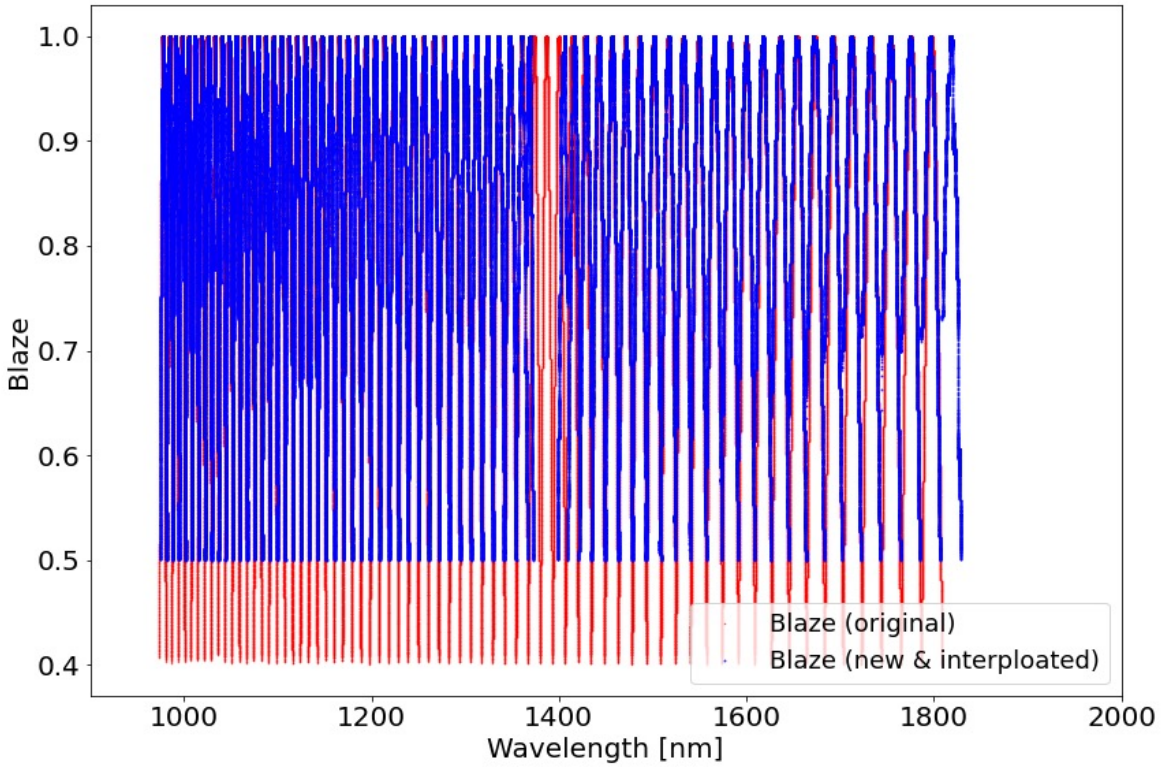
Can use recent wave matrix **NIRPS_WAVE_MATRIX_A.fits** by Danuta for wavelengths of each order and /data/NIRPSDRS/DRS-2.2.11/reduced/2021-06-15/**r.NIRPS_HA_FLAT166_0002_BLAZE_A.fits** for blaze of each order / wavelength

Nolan Grieves
*1 February 2022*

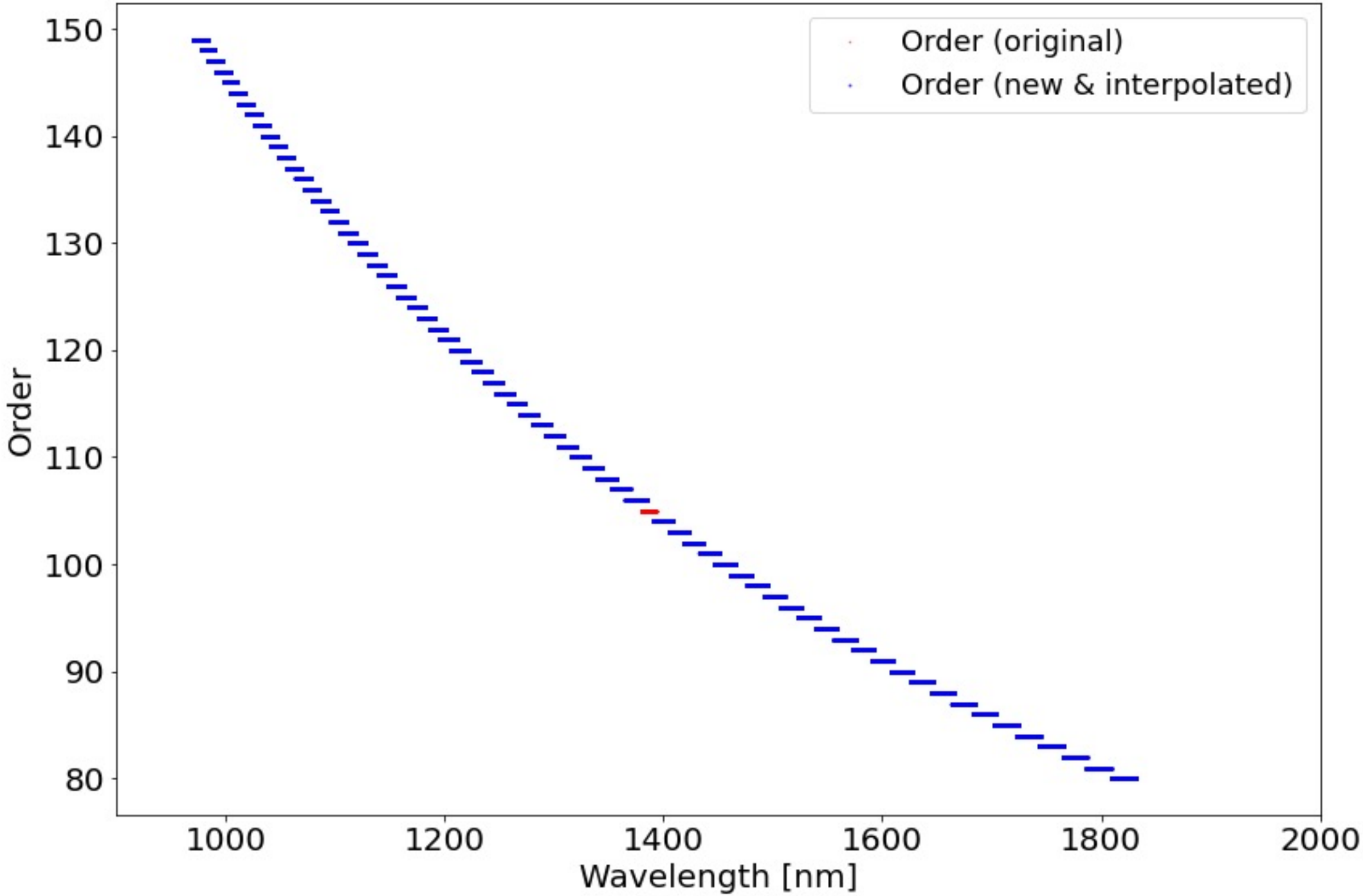
Total Spectral Range

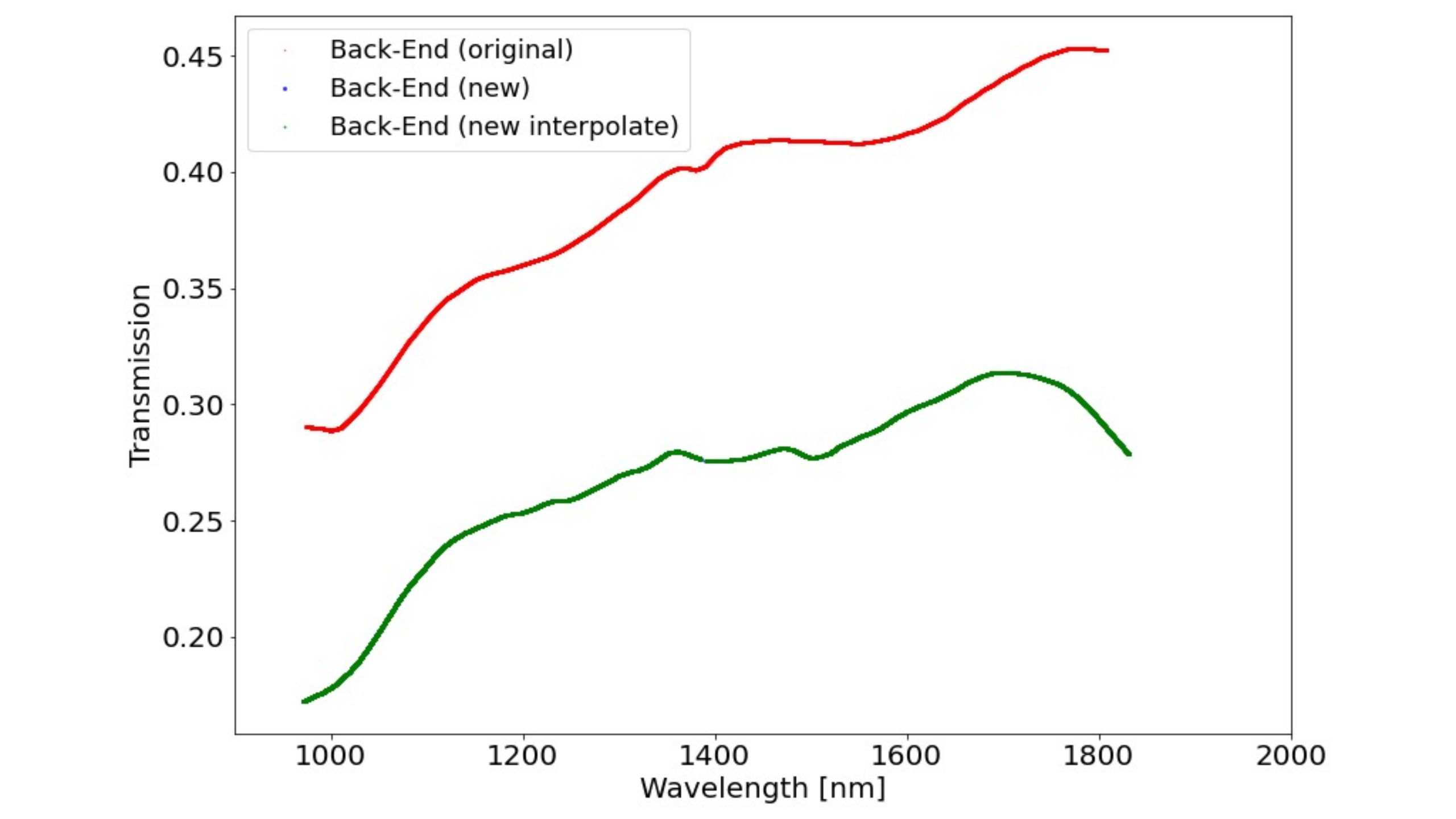


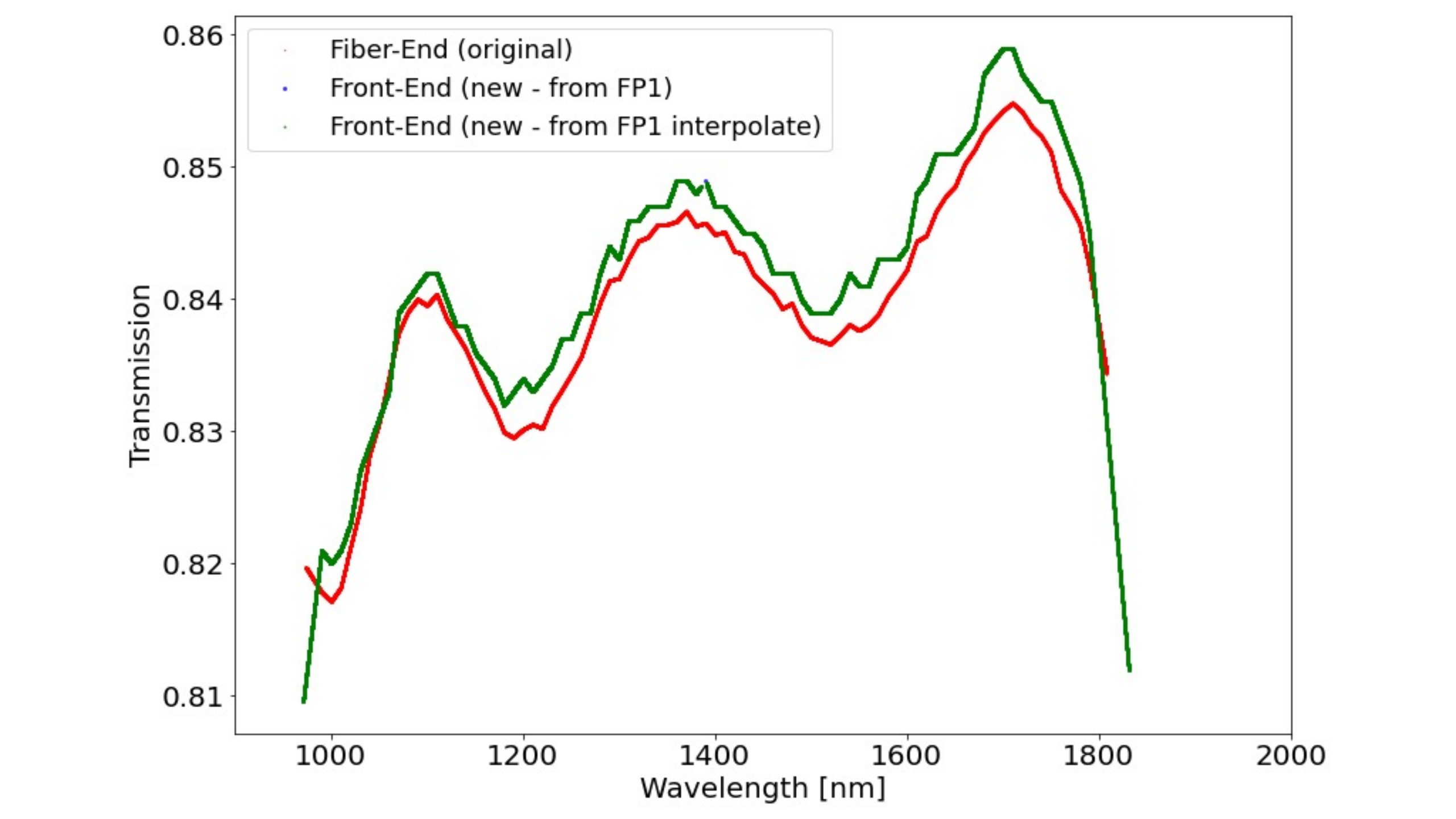

Free Spectral Range

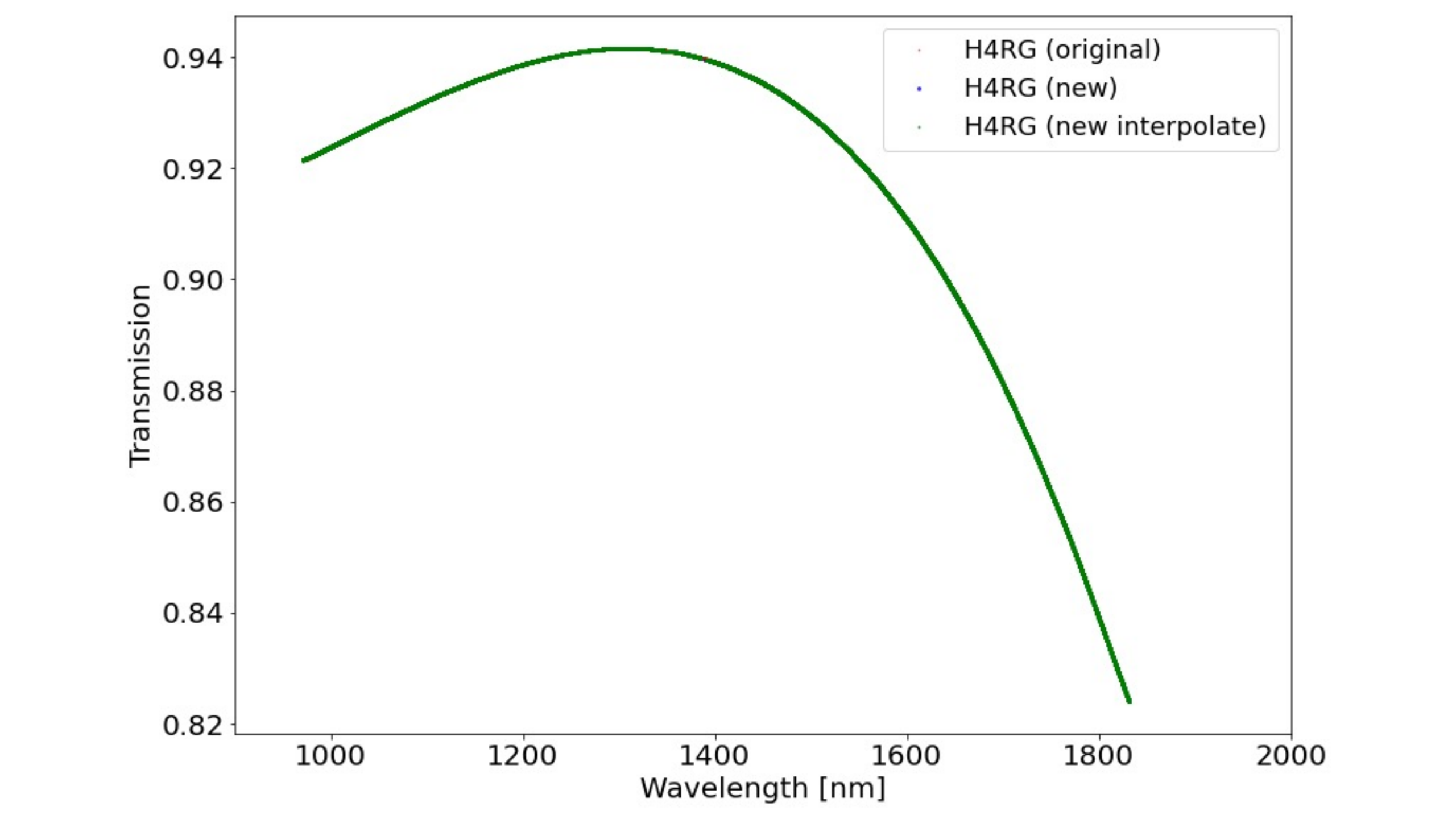


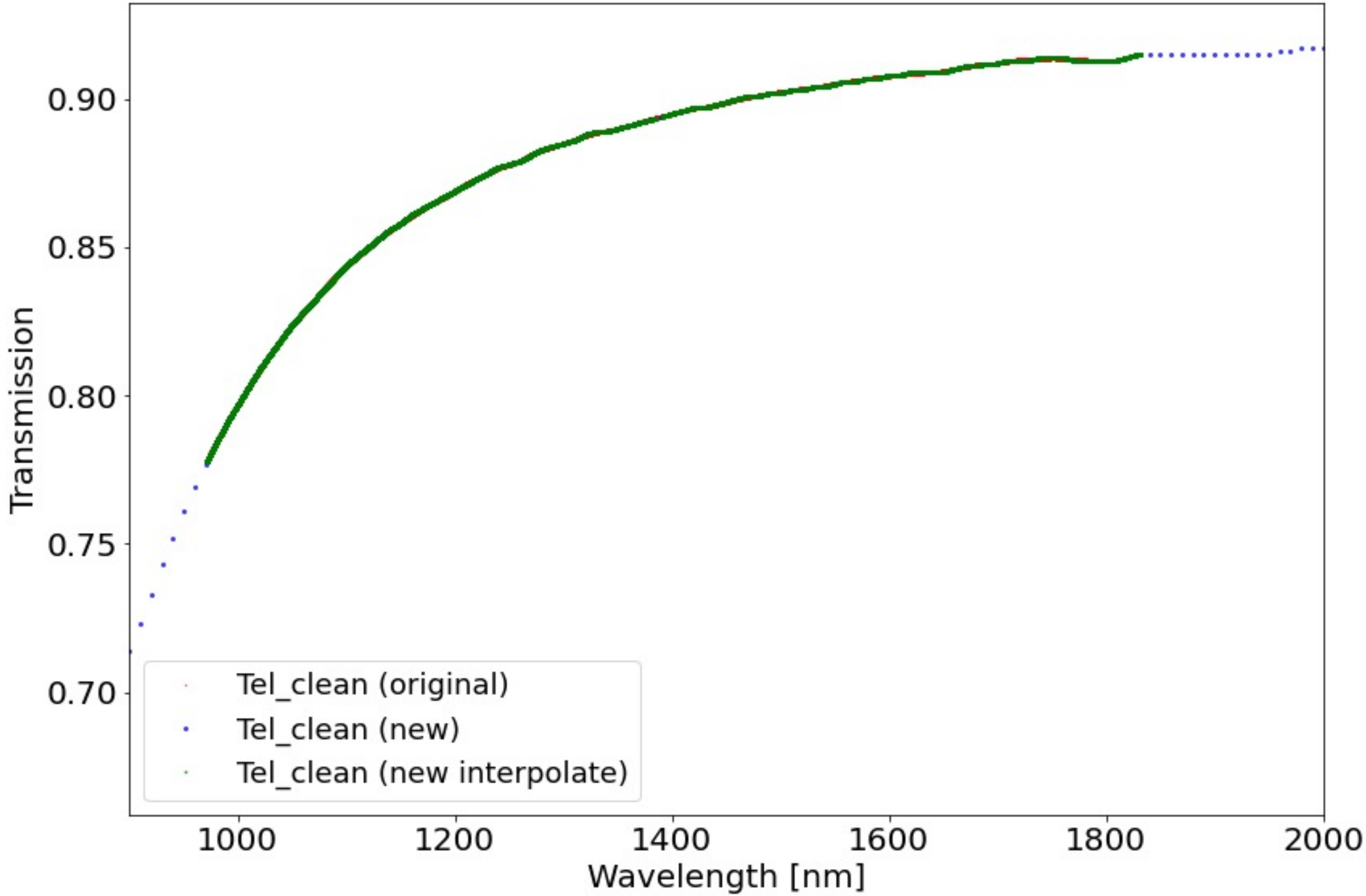

*rest of plots show values using TSR – can be switched to FSR in code update_effs.py

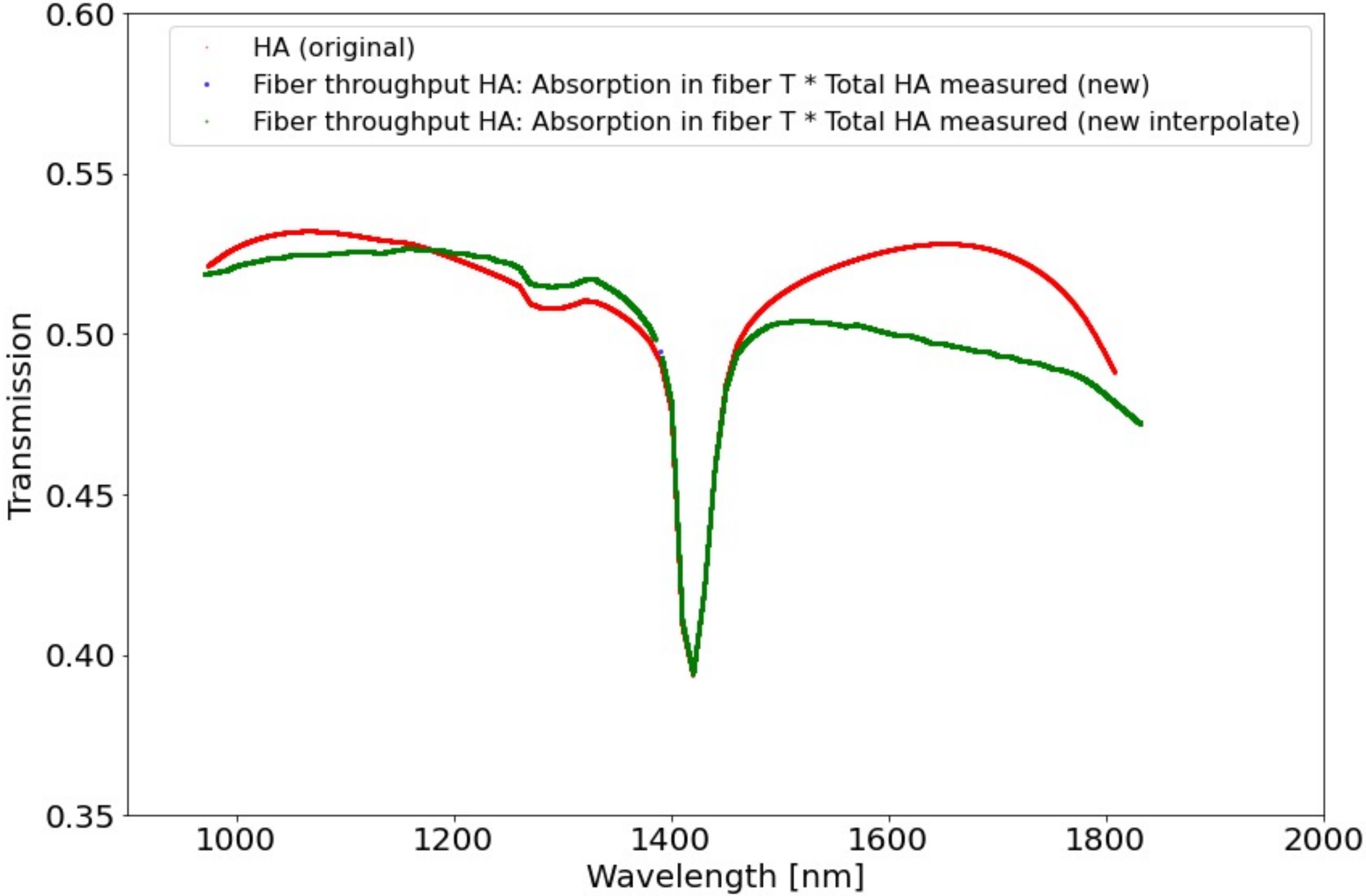

Order (original)
Order (new & interpolated)
150
140
130
120
110
100
90
80
Order
1000
1200
1400
1600
1800
2000
Wavelength [nm]

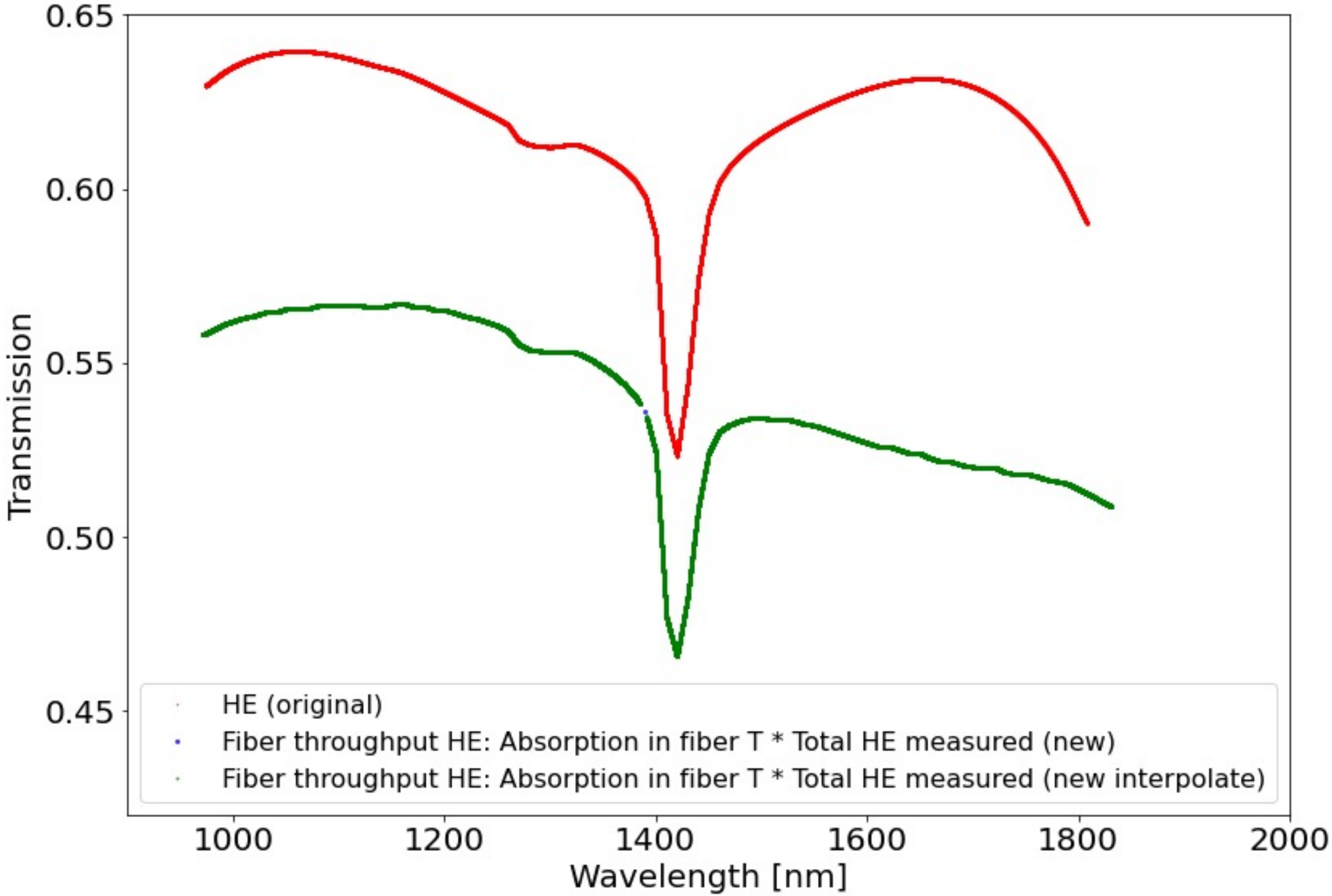

Back-End (original)
Back-End (new)
Back-End (new interpolate)
Transmission
0.45
0.40
0.35
0.30
0.25
0.20
1000
1200
1400
1600
1800
2000
Wavelength [nm]

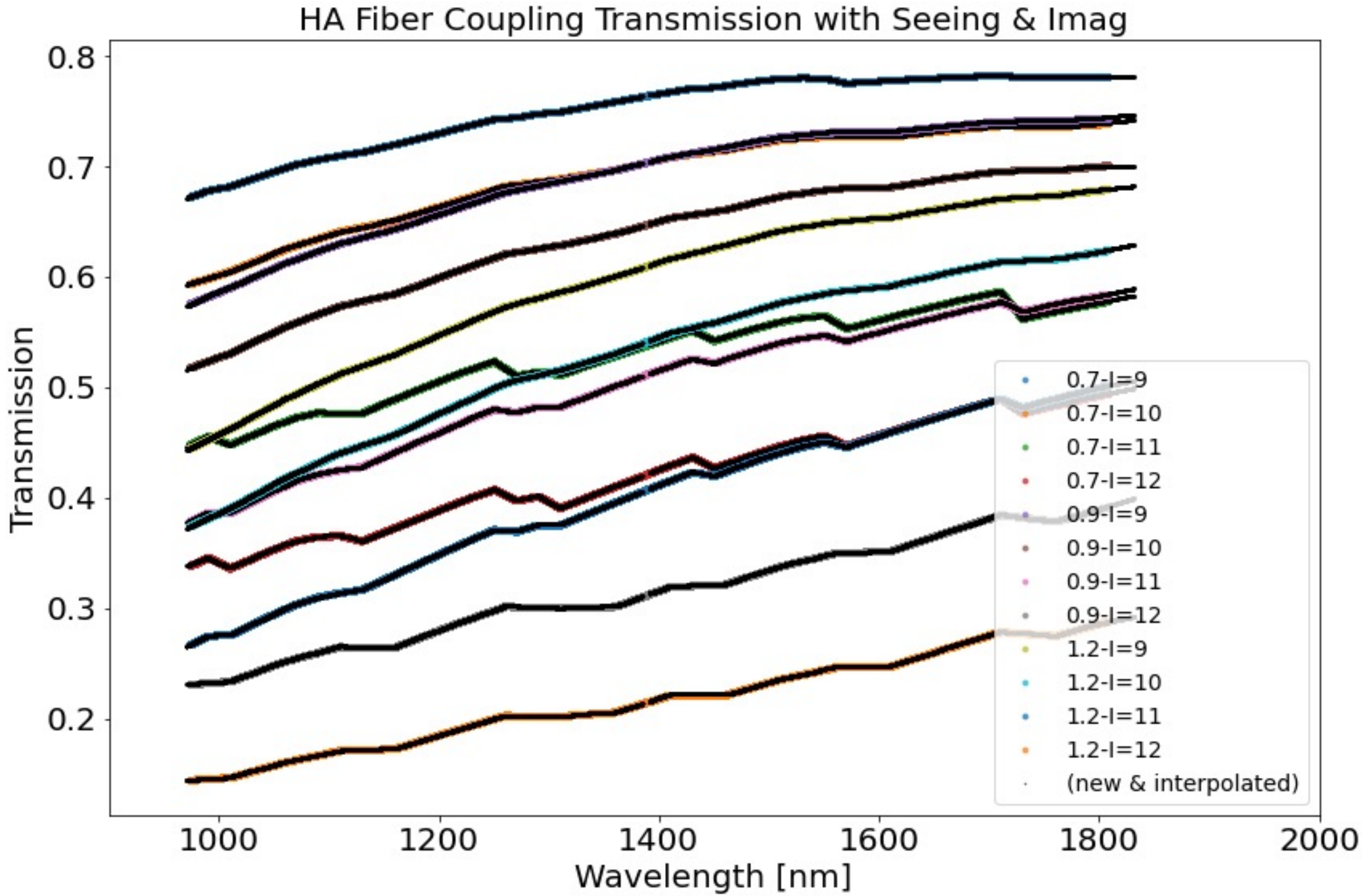

Fiber-End (original)
Front-End (new - from FP1)
Front-End (new - from FP1 interpolate)
Transmission
0.86
0.85
0.84
0.83
0.82
0.81
1000
1200
1400
1600
1800
2000
Wavelength [nm]

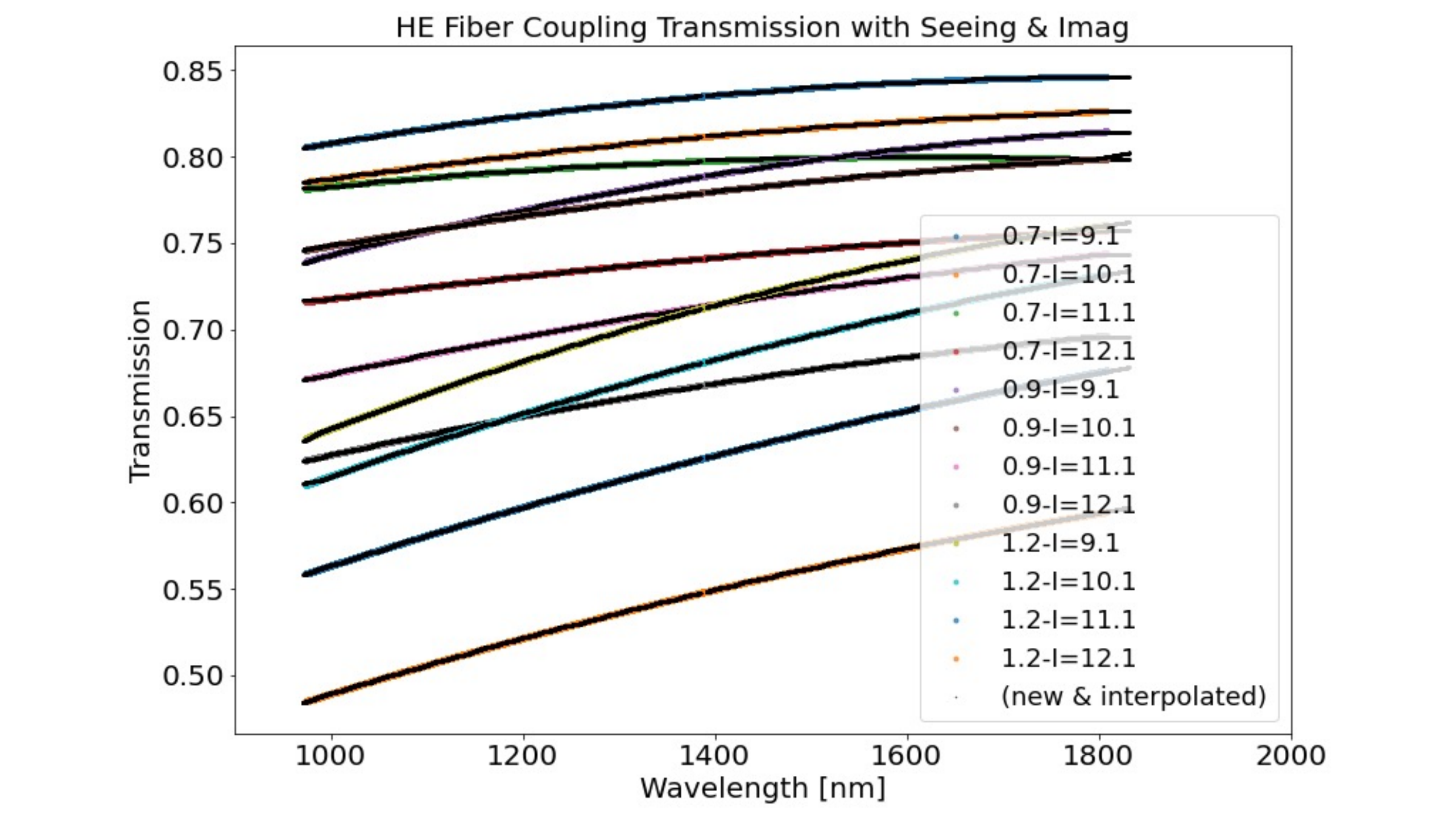

H4RG (original)
H4RG (new)
H4RG (new interpolate)
Transmission
0.94
0.92
0.90
0.88
0.86
0.84
0.82
1000
1200
1400
1600
1800
2000
Wavelength [nm]


0.90
0.85
0.80
0.75
0.70
Transmission
1000
1200
1400
1600
1800
2000
Wavelength [nm]
Tel_clean (original)
Tel_clean (new)
Tel_clean (new interpolate)


HA (original)
Fiber throughput HA: Absorption in fiber T * Total HA measured (new)
Fiber throughput HA: Absorption in fiber T * Total HA measured (new interpolate)
Transmission
0.60
0.55
0.50
0.45
0.40
0.35
1000
1200
1400
1600
1800
2000
Wavelength [nm]


0.65
0.60
0.55
0.50
0.45
Transmission
1000
1200
1400
1600
1800
2000
Wavelength [nm]
HE (original)
Fiber throughput HE: Absorption in fiber T * Total HE measured (new)
Fiber throughput HE: Absorption in fiber T * Total HE measured (new interpolate)


HA Fiber Coupling Transmission with Seeing & Imag
Transmission
Wavelength [nm]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
1000
1200
1400
1600
1800
2000
0.7-I=9
0.7-I=10
0.7-I=11
0.7-I=12
0.9-I=9
0.9-I=10
0.9-I=11
0.9-I=12
1.2-I=9
1.2-I=10
1.2-I=11
1.2-I=12
(new & interpolated)


HE Fiber Coupling Transmission with Seeing & Imag
Transmission
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1000
1200
1400
1600
1800
2000
Wavelength [nm]
0.7-I=9.1
0.7-I=10.1
0.7-I=11.1
0.7-I=12.1
0.9-I=9.1
0.9-I=10.1
0.9-I=11.1
0.9-I=12.1
1.2-I=9.1
1.2-I=10.1
1.2-I=11.1
1.2-I=12.1
(new & interpolated)