

New Horizons Backgrounds

Jayant Murthy

The Indian Institute of Astrophysics

www.iiap.res.in

jmurthy@yahoo.com



Background Light

- Instrumental dark counts.
- ~~Atmospheric emission.~~
 - ~~OI 1304/1356 Å.~~
- Interplanetary emission.
 - Ly $\alpha/\beta/\gamma$
- DGL
 - Dust-scattered light.
 - Line Emission.
 - 2-photon emission.
 - Unresolved stars.
- EBL
 - Unresolved galaxies.

Alice Slit

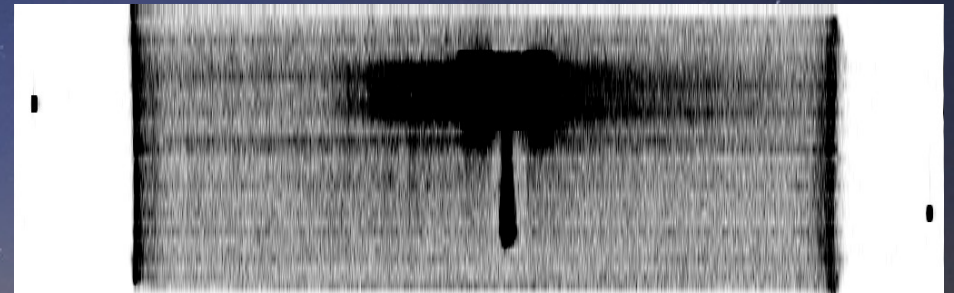
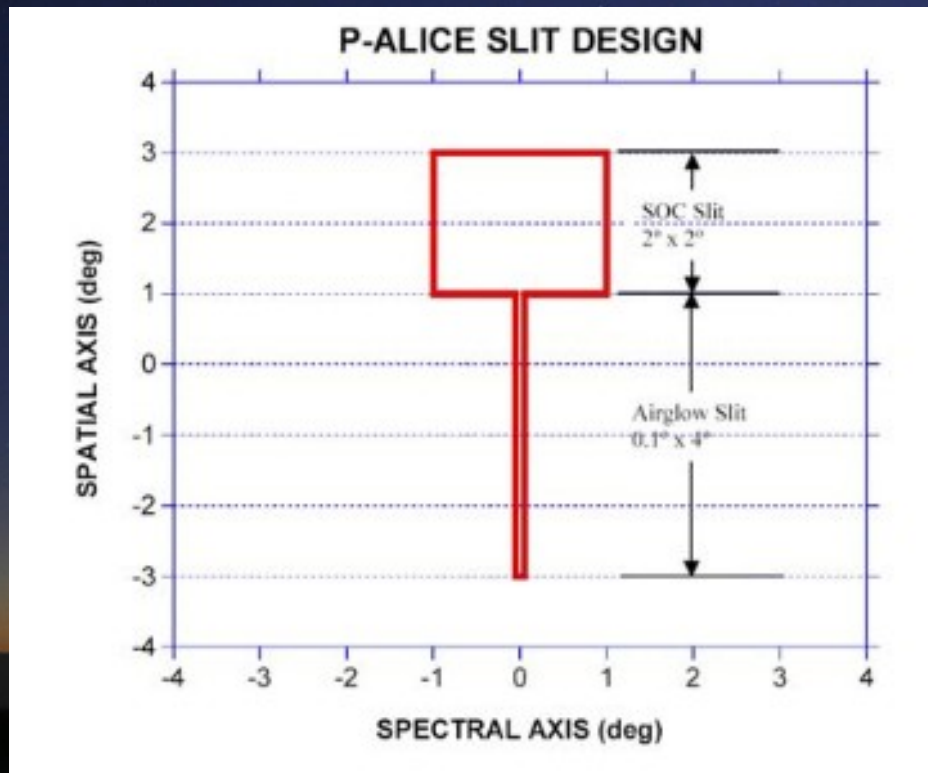
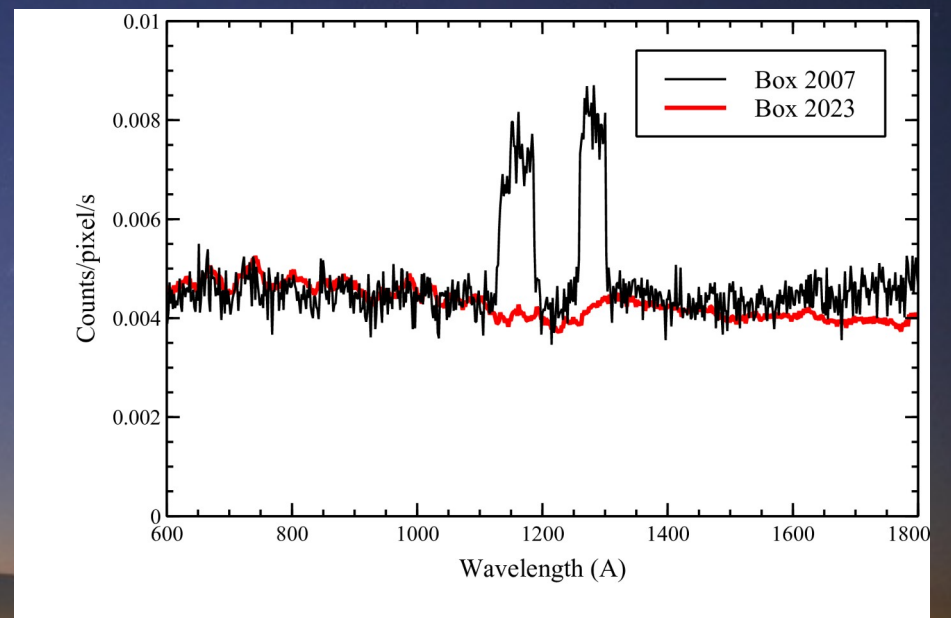
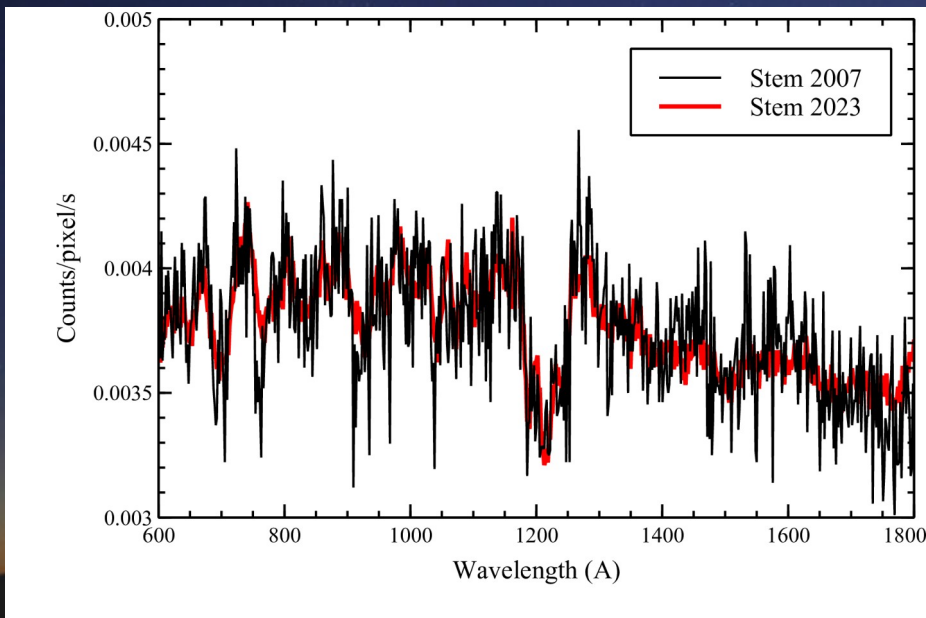


Table 2. Dark Observation with Alice

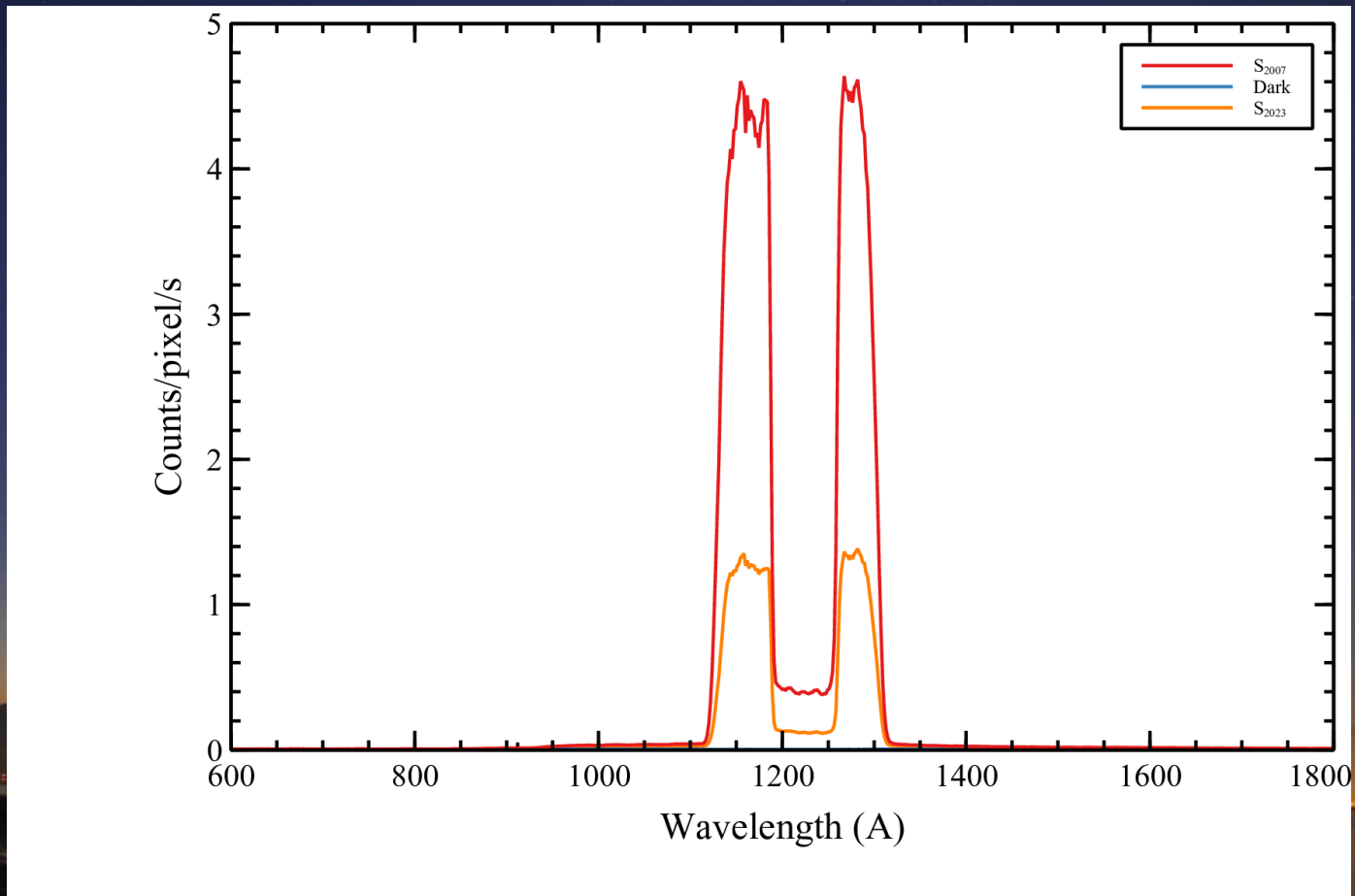
Year	NExp ^a	Exposure Time (s)
2007	3	10,800
2008	3	10,800
2010	3	10,720
2012	3	10,720
2014	3	10,720
2021	9	32,400
2023	367	1,321,200

^a Number of independent exposures.

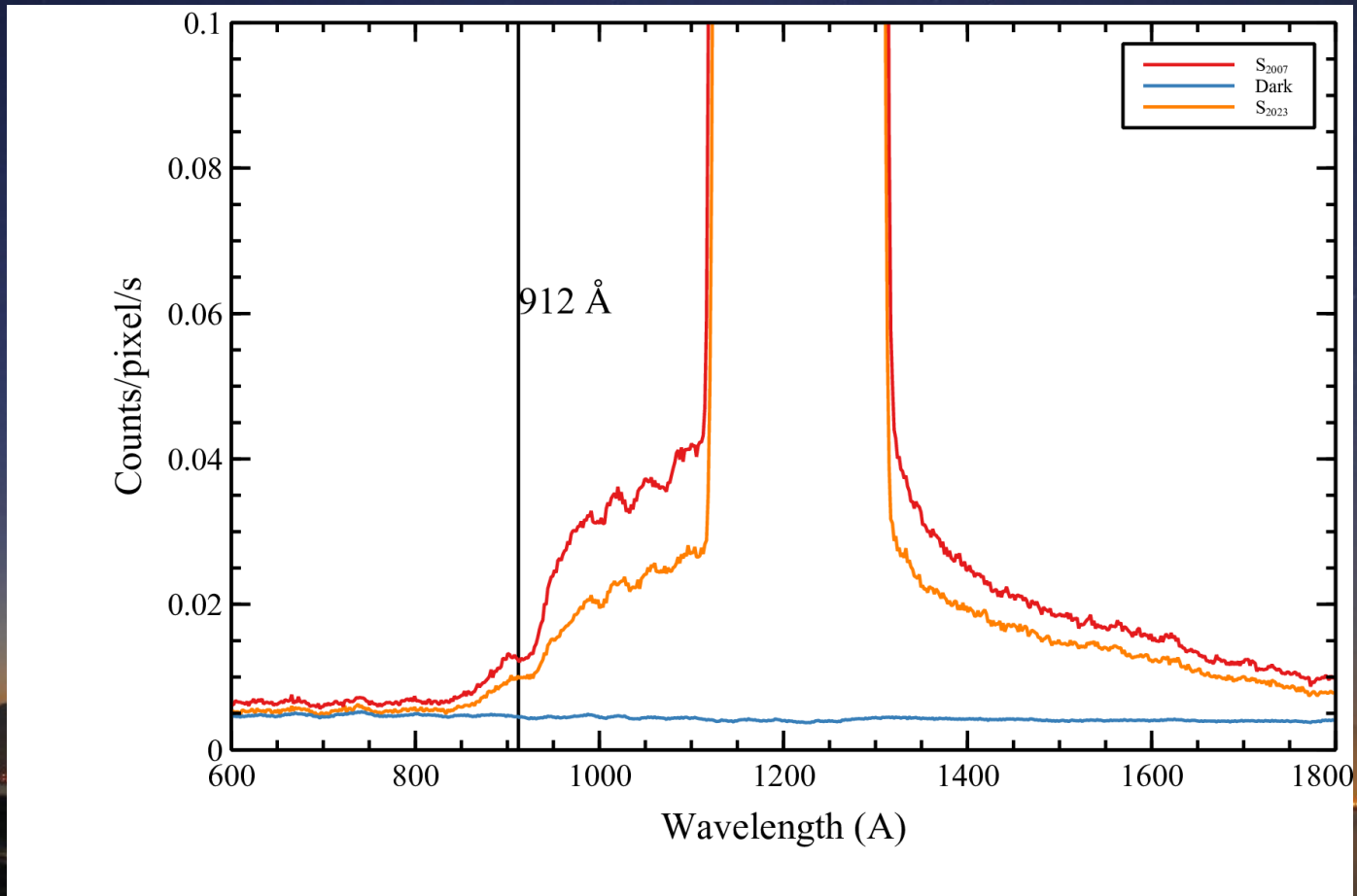
Dark Spectrum



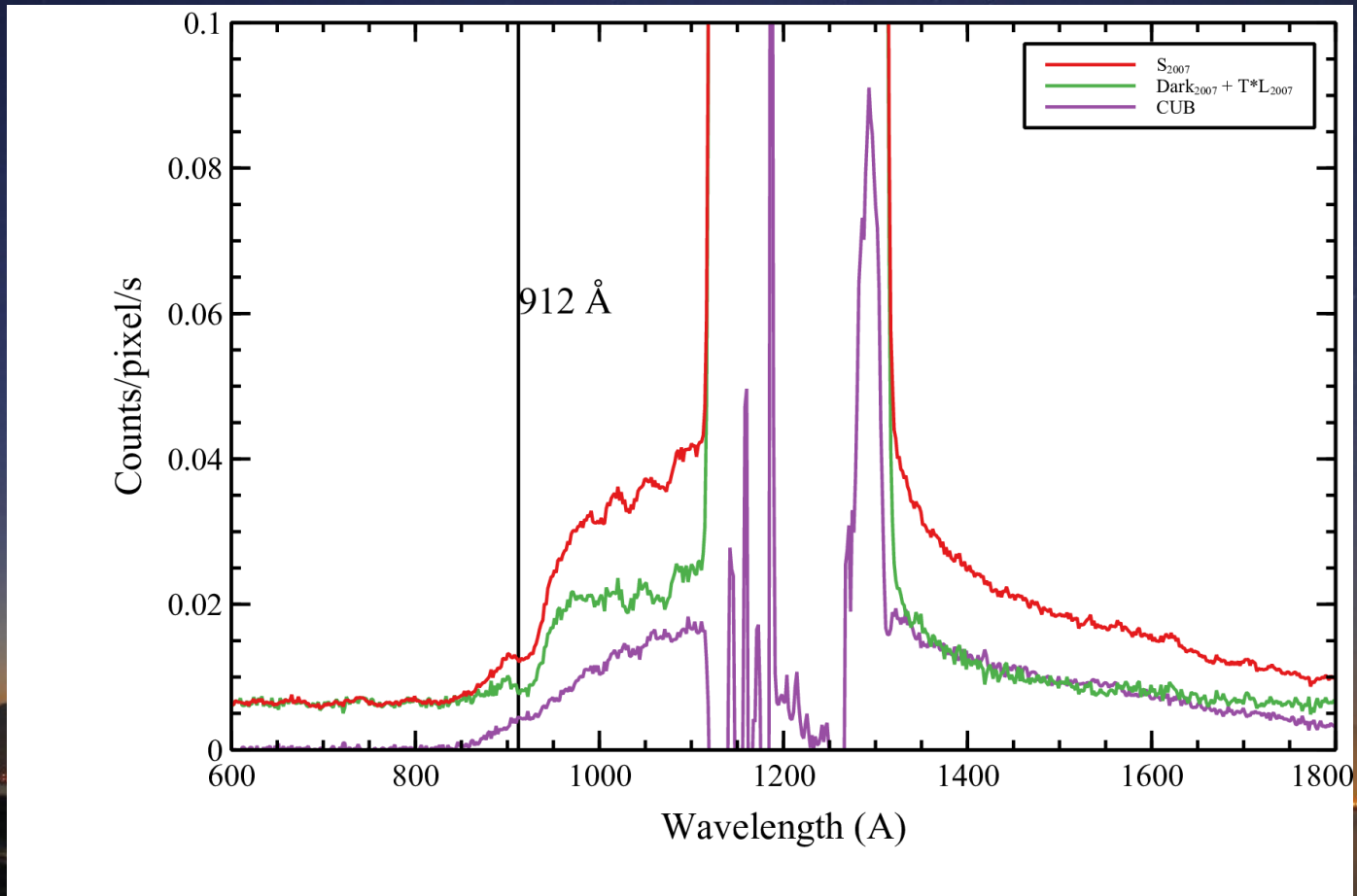
Dark Sky 2007



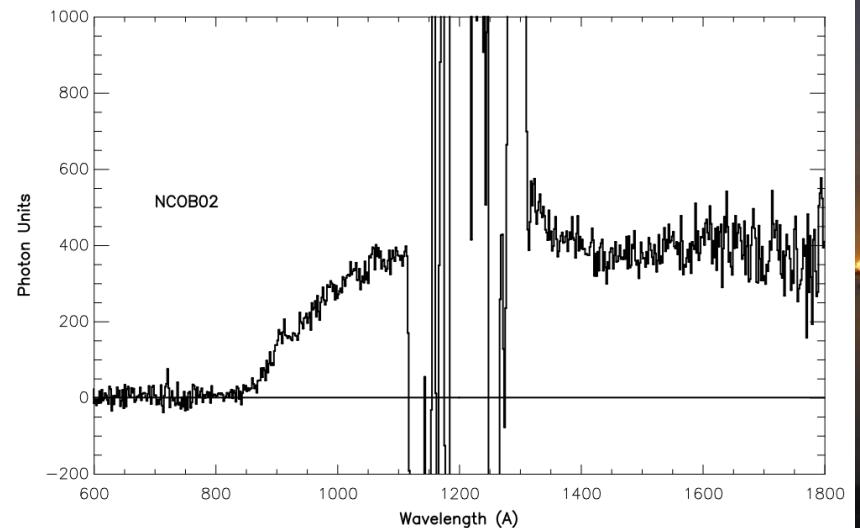
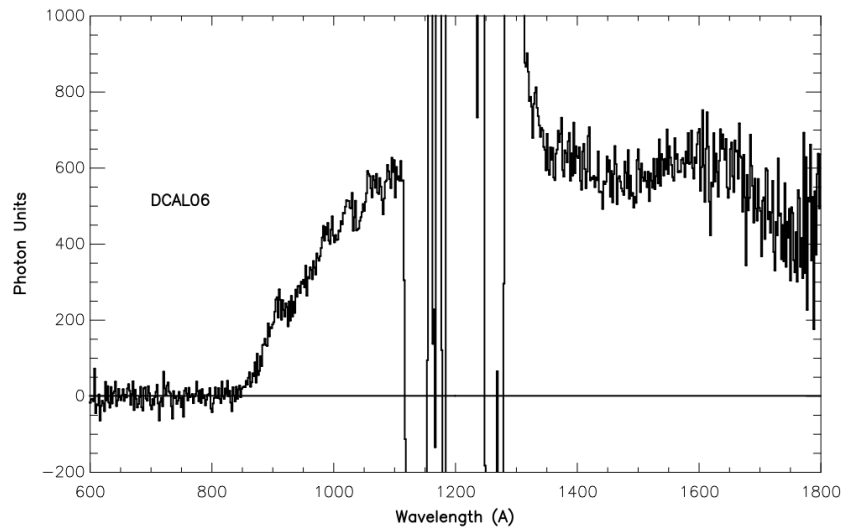
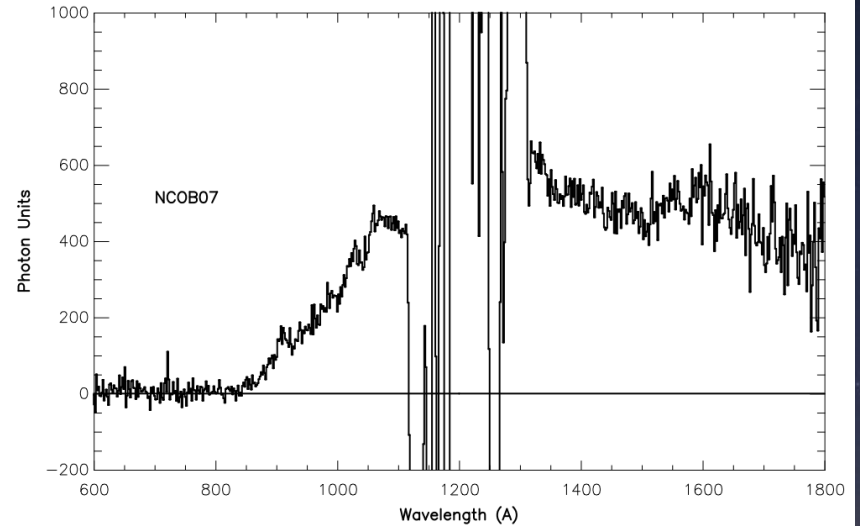
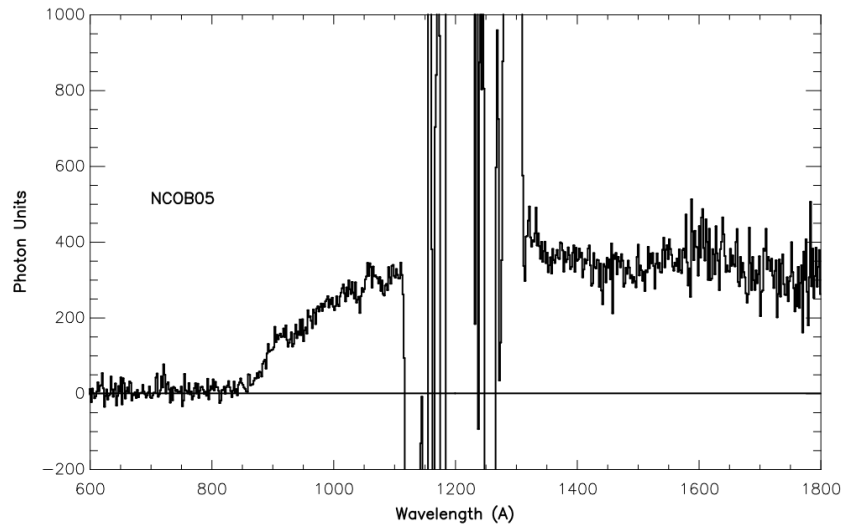
Dark Sky 2007



Scattering Template



Background Spectra



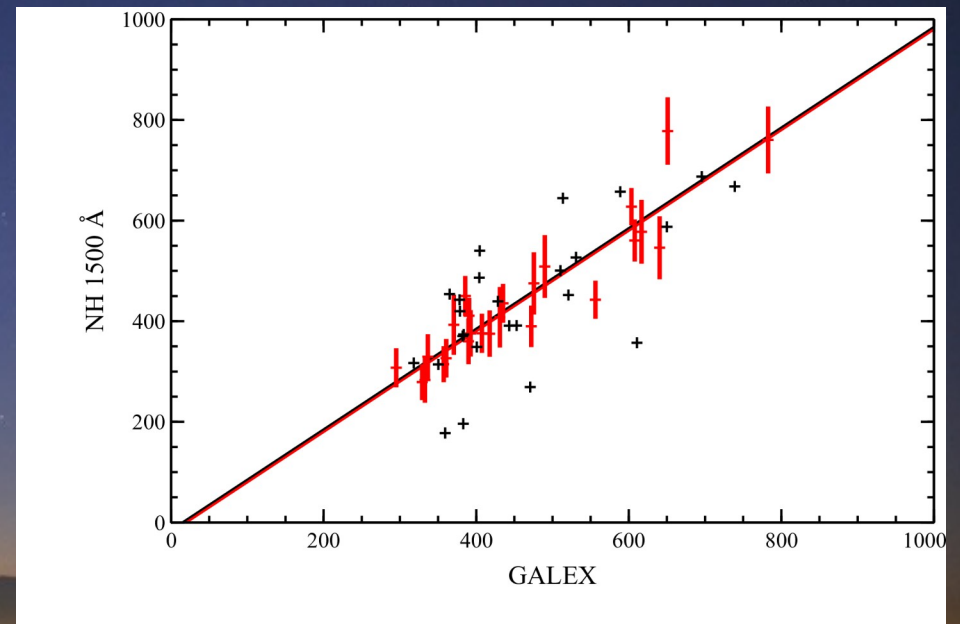
Alice-GALEX (1350 – 1800 Å)

Table 6. GALEX – Alice

	r^a	Slope	Offset
Stem	0.704	1.0 ± 0.17	30.67 ± 82.47
Box	0.928	1.0 ± 0.083	-5.72 ± 37.66

^a Correlation coefficient.

^b photon units



Rescale Stem (0.68) and Box (0.57).

UV-EBV Ratio

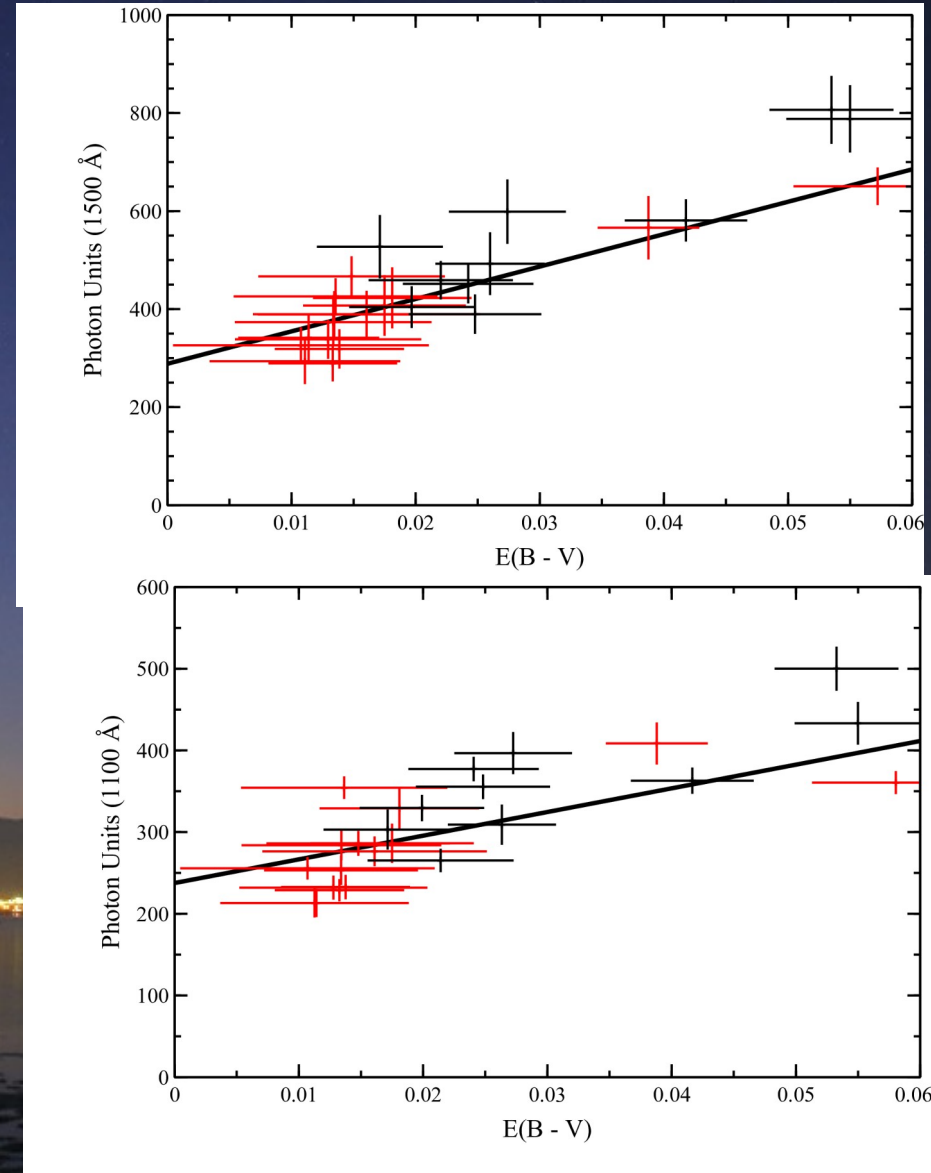
Table 7. Slopes and Offsets

Quantity	r^a	Slope ^b	Offset ^c	χ^2
912 – 1100				
STEM EBV	0.595	2277.2 ± 1465.9	193.6 ± 41.2	0.25
BOX EBV	0.805	2881.8 ± 506.6	238.0 ± 12.5	3.62
1350 – 1800				
STEM EBV	0.662	7534.1 ± 7685.8	226.2 ± 173.8	0.10
BOX EBV	0.906	6575.8 ± 994.6	289.2 ± 26.0	1.07

^a Correlation coefficient.

^b photon units mag⁻¹

^c photon units.

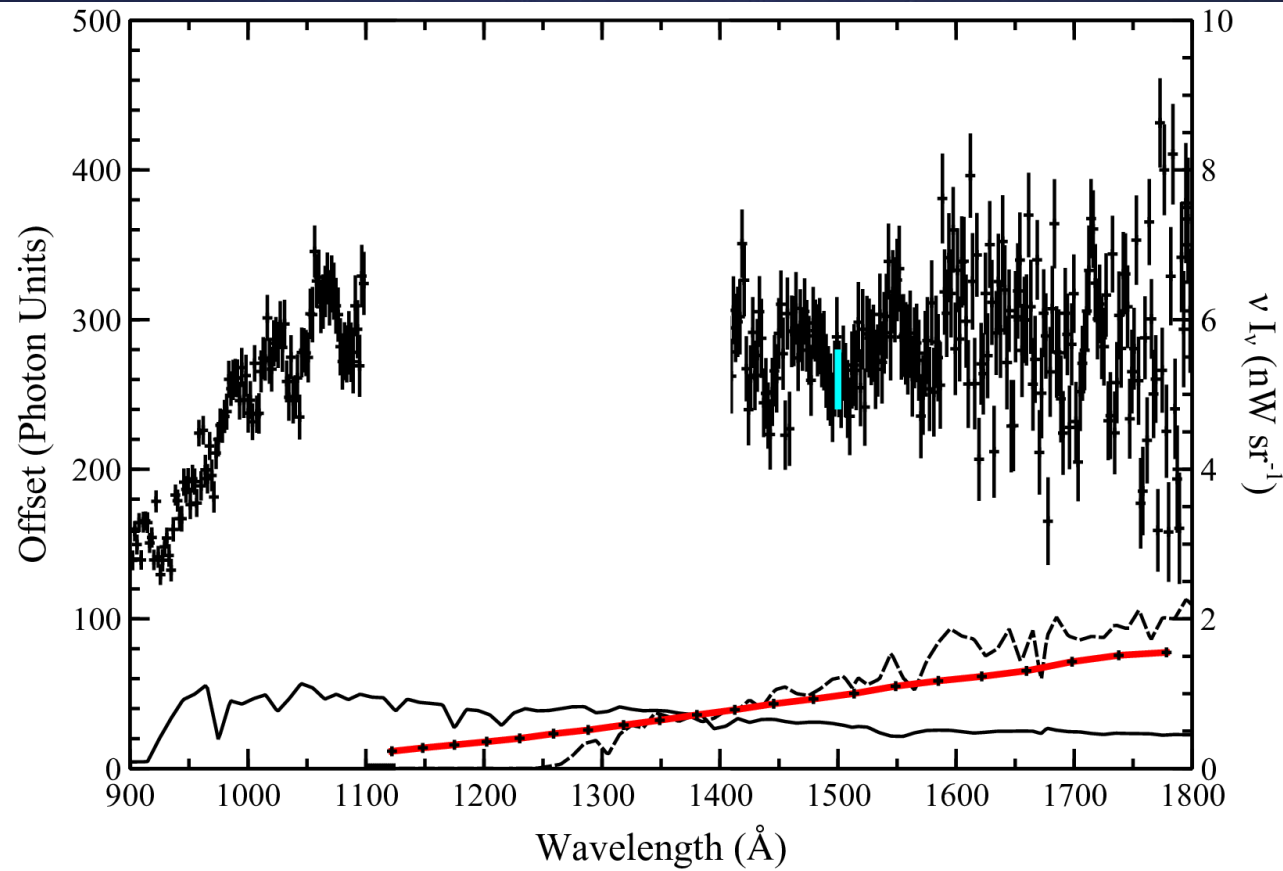


Polar Observations

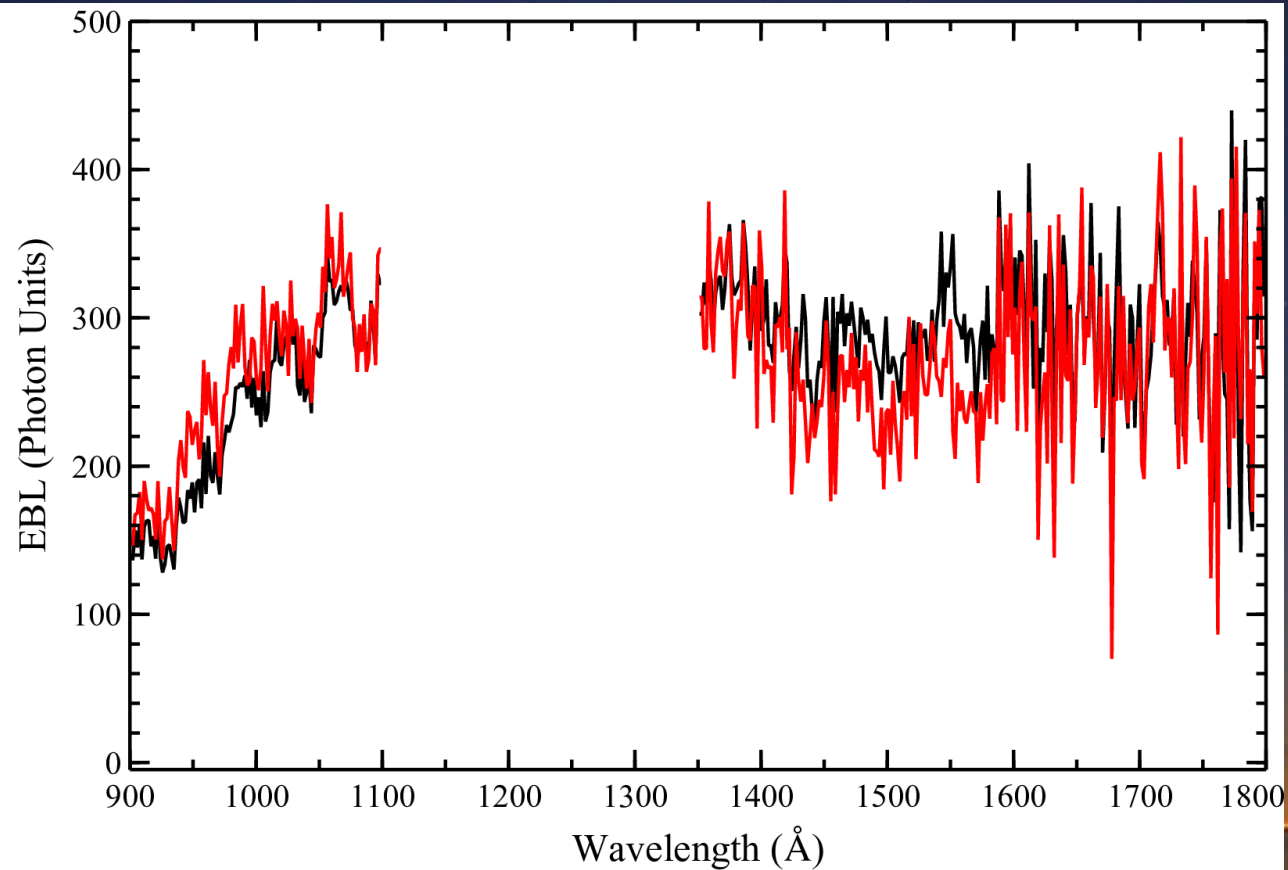
Table 1. Offset Observations

References	Wavelength (Å)	Offset (PU)	Instrument
Henry et al. (1978)	1180 – 1680	250	Apollo 17
Anderson et al. (1979)	1230 – 1680	285 ± 32	Rocket
Paresce et al. (1980)	1350 – 1550	< 300	ASTP
Feldman et al. (1981)	1200 – 1670	150 ± 50	Rocket
Joubert et al. (1983)	1690	300 – 690	D2B
Jakobsen et al. (1984)	1590	< 550	Rocket
	1710	< 900	
Holberg (1986)	1100	< 200	Voyager
Onaka & Kodaira (1991)	1500	200 – 300	Rocket
Henry & Murthy (1993)	1500	300 ± 100	UVX
Witt & Petersohn (1994)	1500	300 ± 80	DE-1
Witt et al. (1997)	1400 – 1800	160 ± 50	FAUST
Schiminovich et al. (2001)	1740	200 ± 100	NUVIEWS
Hamden et al. (2013)	1565	300 PU	Galex
Akshaya et al. (2018)	1565	288 ± 2	GALEX NGP
	1565	241 ± 2	GALEX SGP
Akshaya et al. (2019)	1565	240 ± 18	GALEX

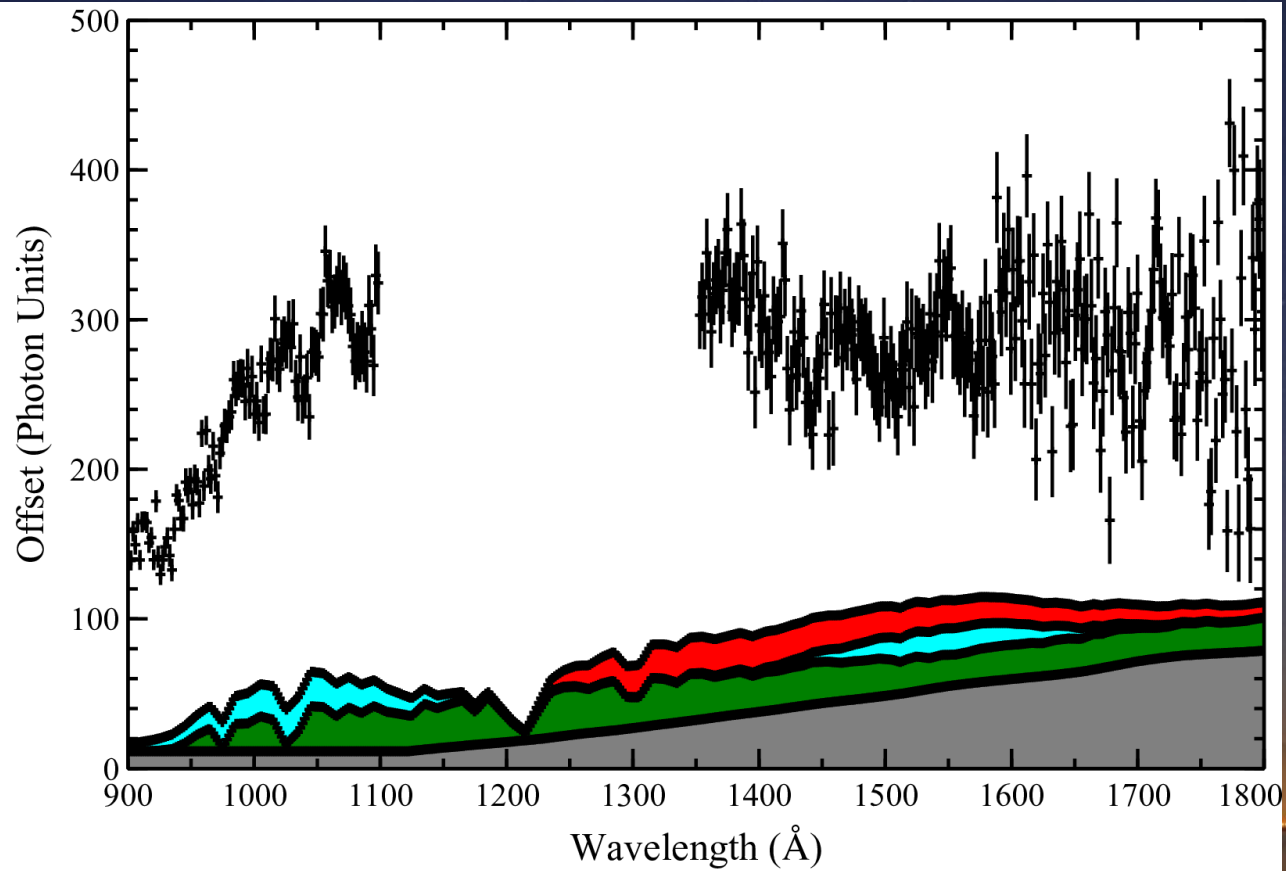
Spectrum of Offset



NGP/SGP Separation



Components of Offset



Future Work

- Study Stem spectra with higher spectral resolution.
- Observations of DGL.
- OVI/CIV emission.
- Molecular hydrogen fluorescence.

