Orbiting Wide-angle Light-collectors (OWL)

Electro-optical Systems
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Basics

- Source is air fluorescence created by passage of Cosmic Ray
- Three ray energies are considered: 10^{20}ev, 10^{21}ev, 10^{22}ev
- Source size is 1km located 1000km from instrument
- 60% transmission to instrument yields: 16, 160, 1600 photons/m^2

OWL Signal vs. Background

log Power-ev	20	20	21	21	22	22
Field Position	Center	Edge	Center	Edge	Center	Edge
Pixel	1 km	1 km	1 km	1 km	1 km	1 km
Wavelength-nm	300-400	300-400	300-400	300-400	300-400	300-400
Integration time-us	3.3	3.3	3.3	3.3	3.3	3.3
Photons/sq m	16	16	160	160	1600	1600
Background/sq m	2.64	2.64	2.64	2.64	2.64	2.64
Ent Ap Area	7.069	7.069	7.069	7.069	7.069	7.069
Primary Mirror	0.950	0.950	0.950	0.950	0.950	0.950
Corrector Plate	0.960	0.960	0.960	0.960	0.960	0.960
Corrector Plate Obs.	0.950	0.950	0.950	0.950	0.950	0.950
Focal Plane Obs.	0.430	0.649	0.430	0.649	0.430	0.649
Filter Efficiency	0.900	0.900	0.900	0.900	0.900	0.900
Detector Live Area	0.800	0.800	0.800	0.800	0.800	0.800
Optics Thru(6 above)	0.268	0.405	0.268	0.405	0.268	0.405
Quantum Efficiency	0.200	0.200	0.200	0.200	0.200	0.200
Total S (Photoel.)	6.067	9.158	60.674	91.575	606.738	915.752
Total B (Background)	1.111	1.677	1.111	1.677	1.111	1.677
S/B	5.460	5.460	54.600	54.600	546.001	546.001
*Near peak of temporal signal						