SNAP TELESCOPE PROPERTIES

SNAP-TECH-06010 rev A
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UCB SSL
Initial release 23 August 2006
Revised 23 July 2007 eliminating whisker, introducing moments Pxx etc.

The following data have been abstracted from SNAP Controlled Document #00008 rev F "Optical Telescope Assembly Definitions and Requirements," #00028 rev C "Mission Definition and Requirements Document," #00203 rev A "SNAP OTA Interface Control Document," and others.

OPTOMECHANICAL PROPERTIES	
Aperture	> 1.9 meters
Central obstruction	< 20% by area
Focal length	22 +- 1 meters
Wavelength range	0.4 to 1.7 μm
Working field area	0.7 square degrees instrumented, >1.0 square degree optical
Working field symmetry	square or rectangular
Working field distortion	< 2% variation in magnification
Strehl ratio zero-G worst field point	0.35 at 0.633 μm 0.65 at 1.00 μm
Strehl ratio zero-G at average point	0.60 at 0.633 μm 0.80 at 1.00 μm
Wavefront Error, zero G:	< 100 nm RMS any point in science field < 70 nm RMS average over all pixels
Wavefront Error, 1 G, horizontal axis	TBD
Wavefront Error, 1 G, vertical axis	TBD
Stability of PSF	Telescope shall deliver on-orbit PSF moments Pxx, Pyy, and Pxy that vary less than **0.1% of (Pxx+Pyy)** over 24 hours at a wavelength of 800 nm. Moments assume Gaussian kernel with σ=0.1 arc second. **Caution**: this specification has yet to be confirmed by simulation.
Optical Throughput	> 60% from 0.4 to 1.0 μm > 90% from 1.0 to 1.8 μm
Emissivity	Irradiance at focal plane shall not exceed 10% of 300K blackbody at 1.7μm
Stray Light:	Shall not exceed 10% of zodi when aimed anywhere within 20 degrees of the North Ecliptic Pole.
Stray Heat:	Exit pupil shall be a real pupil not virtual; cold stop for detector shall not obstruct the aperture.

MISSION RELATED PROPERTIES AND CONSTRAINTS	
Solar avoidance	axis > 70 degrees from Sun
Focussing	6 d.o.f. adjustment at secondary mirror
Telescope length	< 4 meters [TBC]
Telescope diameter	< 2.5 meters [TBC]
Telescope mass	< 600 kg includes cold stop conical shield per Telescope Interface Control Document
Attachment to observatory	semi-kinematic mounts
Electrical power	< 130 watts (average)
Launch peak acceleration	+11, -3 G vertical ±5 G lateral
Lowest resonance frequency	> 35 Hz [TBC]
Thermal control stability	< 0.1 degC/hour [TBC]

RELATED PAYLOAD ELEMENTS These elements are critical with regard to telescope stray light, stray heat, thermal environment, etc but are not grouped within Telescope category for purposes of constraining length, diameter, mass.
Outer baffle
Deployable front cover
Aft light shield
Cassegrain shutter