# Supernova/Acceleration Probe – Fact Sheet
## http://snap.lbl.gov

Numbers in this document are illustrative, representing a reference mission that is self-consistent, technically feasible, risk reduced, and specifically designed to meet science requirements, strictly controlling statistical and systematic uncertainties. These numbers serve as a reference model for future optimization studies.

Reference SNAP surveys

| Program | Solid Angle Per Filter (sq. deg.) | Exposure Per Scan (s) | Cadence (days) | # Scans | Depth Per Filter (AB mag) |
|---|---|---|---|---|---|
| Deep North | 7.5 | Optical: 4 x 300<br>NIR: 8 x 300 | 4 | 120 | Per scan: 27.7<br>Coadded: 30.3 |
| Wide-field | 300-1000 | Optical: 6 x 200<br>NIR: 12 x 200 | … | 1 | 27.7 |
| Deep South | 7.5 | Optical: 4x 300<br>NIR: 8 x 300 | 4 | 120 | Per scan: 27.7<br>Coadded: 30.3 |
| Panoramic | 7000-10000 | Optical: 6 x 67<br>NIR: 12 x 67 | … | 1 | 26.7 |

Telescope reference parameters

| | |
|---|---|
| Focal Length | 21.66 meters |
| Aperture | 2.0 meters |
| Optical field | Annular, 6 to 13 mrad; 1.37 sq. deg. |
| Geometric blur | 2.8 microns rms |

SNAP optical photometry reference model specifications

| | |
|---|---|
| Field-of-view | 0.34 square degrees; 441M pixels |
| Plate Scale | 0.10 arcsec/pixel |
| Wavelength coverage | 350 nm – 1000 nm |
| Detector Type | High-resistivity p-channel CCD's |
| Detector Architecture | 36 3.5k x 3.5k CCD's with 10.5 micron pixels |
| Detector Array Temperature | 140 K |
| Detector Quantum Efficiency: | >80% @ 400-800 nm |
| Read Noise | 4 e- @100 kHz (6 e- required) |
| Dark Current | 0.005 e-/s/pix (0.03 e-/s/pix required) |
| Readout Time | 30 sec |
| Filters | 6 bands: peaked at 0.44,0.51,0.59,0.69,0.80,0.92μm |

SNAP NIR photometry reference model specifications

| | |
|---|---|
| Field-of-view | 0.34 square degrees; 151M pixels |
| Plate Scale | 0.17 arcsec/pixel |
| Wavelength coverage | 900nm - 1700nm |
| Detector Type | HgCdTe (1.7 μm cut-off) or InGaAs |
| Detector Architecture | 36 2kx2k Array's with 18-20 micron pixels |
| Detector Array Temperature | 140 K |
| Detector Quantum Efficiency | >60% average |
| Read Noise | 5 e- (multiple samples) (8 e- required) |
| Dark Current | 0.02 e/s/pix (0.2 e/s/pix required) |
| Readout Time | 30 sec |
| Filters | 3 bands; peaked at 1.07, 1.24, 1.44 μm |

SNAP spectrograph reference model specification

| | |
|---|---|
| Spectrograph architecture | Integral field spectrograph, two arms |
| Wavelength coverage | 350-980nm, 980-1700nm |
| Plate scale | 0.15 arcsec/pixel |
| Spatial resolution of image slicer | 0.15 arcsec/slice |
| Pixel size | HgCdTe: 18 μm, CCD: 15-20 μm |
| Field-of-View | Redundant 3 x 3 arcsec |
| Location | Mounted on focal plane |
| Resolution | $\lambda/\delta\lambda = 100$ |
| Detector Type | CCD's (visible arm), HgCdTe (NIR arm) |
| Detector Architecture | 1k x 1k each CCD, HgCdTe; fully-redundant |
| Detector Array Temperature | 140 K |
| Detector Quantum Efficiency: | 80% <QE> (visible), 60% <QE> HgCdTe |
| Cumulative throughput | 52% (visible); 45% (NIR) |
| Read Noise | 2 e- (visible), 5 e- (NIR) multiple reads<br>required: 4e- (vis), 8 e- (NIR mult.) |
| Dark Current | 0.001e-/s (visible), 0.02 e-/s (NIR)<br>required: 0.01e- (vis), 0.03 e-/s (NIR) |
| Exposure Time | Vis: 300s, NIR: 1000s |

Mission reference parameters

| | |
|---|---|
| Orbit | L2 halo orbit |
| Pointing stability | Within 0.02 arcsec; focal plane feedback |
| Time on target | 87% |
| Calibration | Standard star network to AB 20 mag |