Starshade Technology Development Activity (S5)
Level 1 Technology Development Milestones

MS #	Milestone	Report Completion Date
1A	Small-scale starshade mask in the Princeton Testbed demonstrates $1x10^{-10}$ instrument contrast at the inner working angle in narrow band visible light and Fresnel number ≤ 15.	1/28/2019
1B	Small-scale starshade mask in the Princeton Testbed demonstrates $1x10^{-10}$ instrument contrast at the inner working angle at multiple wavelengths spanning ≥ 10% bandpass at Fresnel number ≤ 15 at the longest wavelength.	3/30/2019
2	Small-scale starshade masks in the Princeton Testbed validate contrast vs. shape model to within 25% accuracy for induced contrast between 10^{-9} and 10^{-8}.	1/15/2020
3	Optical edge segments demonstrate scatter performance consistent with solar glint lobes fainter than visual magnitude 25 after relevant thermal and deploy cycles.	11/1/2019
4	Starshade Lateral Alignment Testbed validates the sensor model by demonstrating lateral offset position accuracy to a flight equivalent of ± 30 cm. Control system simulation using validated sensor model demonstrates on-orbit lateral position control to within ± 1 m.	11/14/2018
5A	Petal subsystem with *shape critical features* demonstrates shape stability after deploy cycles and thermal cycles (deployed) consistent with a total pre-launch shape accuracy within ± 70 µm.	12/20/2019
5B	Petal subsystem with *all features* demonstrates total pre-launch shape accuracy (manufacture, deploy cycles, thermal cycles deployed, & storage) to within ± 70 µm.	6/2/2023
6A	Petal subsystem with *shape critical features* demonstrates on-orbit thermal stability within ± 80 µm by analysis using a validated model of critical dimension vs. temperature.	12/20/2019
6B	Petal subsystem with *all features* demonstrates on-orbit thermal stability within ± 80 µm using a validated model of critical dimension vs. temperature.	6/2/2023
7A	Truss Bay *longeron and node subassemblies* demonstrate dimensional stability with thermal cycles (deployed) consistent with a total pre-launch petal position accuracy within ± 300 µm.	12/20/2019
7B	Truss Bay *assembly* demonstrates dimensional stability with thermal cycles (deployed) and storage consistent with a total pre-launch petal position accuracy within ± 300 µm.	6/2/2023
7C	Inner Disk Subsystem with optical shield assembly that includes *deployment critical features* demonstrates repeatable deployment accuracy consistent with a total pre-launch petal position accuracy within ± 300 µm.	12/20/2019
7D	Inner Disk Subsystem with optical shield assembly that includes *all features* demonstrates repeatable deployment accuracy consistent with a total pre-launch petal position accuracy within ± 300 µm.	6/2/2023
8A	Truss Bay *longeron and node subassemblies* demonstrate on-orbit thermal stability within ± 200 µm by analysis using a validated model of critical dimension vs. temperature.	12/20/2019
8B	Truss Bay *assembly* demonstrates on-orbit thermal stability within ± 200 µm by analysis using a validated model of critical dimension vs. temperature.	6/2/2023