

Annex E. Multi-asteroid Touring CubeSat Problem Optimization Results

Table E.3. Comparison of baseline and optimized surface properties

	Baseline value		Optimized value	
	ϵ	α	ϵ	α
Geometry				
MS (Main Spacecraft)				
Side Panel X+	0.03	0.1	0.095	0.078
Side Panel X−	0.03	0.1	0.258	0.073
Side Panel Y+	0.03	0.1	0.072	0.291
Side Panel Y+ inner surface	0.04	0.26	0.072	0.291
Side Panel Y−	0.03	0.1	0.428	0.07
Side Panel Y− inner surface	0.04	0.26	0.428	0.07
Side Panel Z+	0.03	0.1	0.71	0.07
Side Panel Z−	0.03	0.1	0.02	0.07
Propulsion	0.89	0.72	0.02	0.27
E-sail	0.022	1.0	0.02	0.94
Instrument	0.04	0.26	0.02	0.173
Bottom Bus Plate	0.04	0.26	0.634	0.133
Solar Array back side	0.89	0.72	0.94	—
RU (Remote Unit)				
Solar Array back side	0.035	0.14	0.94	—
External body surface	0.106	0.5	0.94	0.149

Table E.4. MAT Comparison of baseline and optimized temperatures. Baseline temperature at hot case is computed for optimized transmitter heat dissipation

Subsystem	Temperature before optimization, °C		Temperature after optimization, °C	
	min	max	min	max
MS (Main Spacecraft)				
Battery	−0.9	+95.8	−0.15	+44.8
Main bus	−4.0	+96.4	−17.0	+44.9
Propulsion	−7.6	+99.8	−10.15	+56.4
Transmitter	−7.6	+108.1	−20.15	+49.9
Optical instrument	−10.5	+95.5	−20.15	+32.8
Reaction wheels	−7.6	+100.2	−20.15	+49.6
RU (Remote Unit)				
Main bus with battery	4.4	63.0	−0.15	+44.8
Tether-reel subsystem	−7.6	64.9	−10.7	+48.7
Electric propulsion	−7.6	60.0	−10.15	+56.5