**Initial Parameters for Detumbling Mode**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| CubeSat type | 2U |
| Dimensions | LxWxH = 10cmx10cmx20cm |
| Mass | 3.6kg |
| Altitude | 400km |
| Moments of inertia about x | 0.491075101 kg⋅m2 |
| Moments of inertia about y | 0.969100491 kg⋅m2 |
| Moments of inertia about z | 0.976380180 kg⋅m2 |
| Coil cross sectional area | 7cm2 |
| Initial angular velocity | [0.01745 0.01745 0.01745] rad/sec[[1]](#footnote-1) |
| Initial attitude (roll, pitch, yaw) | [5 5 5] degree |
| B-dot constant | 1x105 |
| Mc | 1x10-3 |

**Initial Parameters for Stabilization Mode (Normal Operation)**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| CubeSat type | 2U |
| Dimensions | LxWxH = 10cmx10cmx20cm |
| Mass | 3.6kg |
| Altitude | 400km |
| Moments of inertia about x | 0.491075101 kg⋅m2 |
| Moments of inertia about y | 0.969100491 kg⋅m2 |
| Moments of inertia about z | 0.976380180 kg⋅m2 |
| Coil cross sectional area | 7cm2 |
| Initial angular velocity | [0 0 0] rad/sec |
| Initial attitude in Euler angles | [5 5 5] degree |
| Desired attitude in Euler angles | [0 0 0] degree |
| Gain parameters | 10, 0.01 |

**Initial Parameters for Disturbance Torques**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| **Aerodynamic Torque** | |
| Atmospheric density (rho, ρ) | 4 x 10-12 kg/m3 |
| Aerodynamic drag coefficient (CD) | 2.0 |
| Orbital velocity (V) |  |
| Frontal projected area (A) |  |
| Vector from CoM to CP (r) | 0.1 m |
| **Magnetic Torque** | |
| Spacecraft residual magnetic dipole (M) | 0.1 Atm2 |
| Earth magnetic field vector (B) | 3 x 10-5 TESLA |
| **Solar Radiation Torque** | |
| Solar constant (Is) | 1400 W/m2 |
| Reflectivity (K) | 0.5 |
| Vector from CoM to CP (r) | 0.1 m |

1. https://arxiv.org/pdf/1707.04959.pdf [↑](#footnote-ref-1)