## IN-ORBIT LIFETIME OF SATELLITES

## Research Question What factors affect the decay of satellite orbits in low-Earth orbit? Vary Initial Methodology Altitude General Mission Data analysis with Vary Cross-Data Files **Analysis Tool** sectional area Python Simulations Vary Solar Results & Discussion Flux 1. Initial Altitude 2. Cross-sectional area 3. Solar Flux Time to decay against Cross sectional area Time to decay against Solar Flux Time to decay against initial altitude 17.5 100 15.0 Time to 0 2.5 150 250 200 10 60 Average Solar Flux @10.7cm/ W m-2 Hz-1 Cross sectional area/ m2 Initial Altitude/km Experiments verify that an increase Experiments verify that an Experiments verify that an increase in in cross-sectional area results in a increase in solar flux results in initial orbital altitude results in an exponential increase in time to decay decreased time to decay an exponential decrease in time to decay Conclusion and Future Work While this project has furthered my understanding of satellite orbits, I believe there is much more to be discovered. I would like to thank my mentors for their continued support, as well as DSTA for the opportunity to do this project. Future work could involve investigations into space debris mitigation by exploiting these factors, as well as development of models with higher fidelity.

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