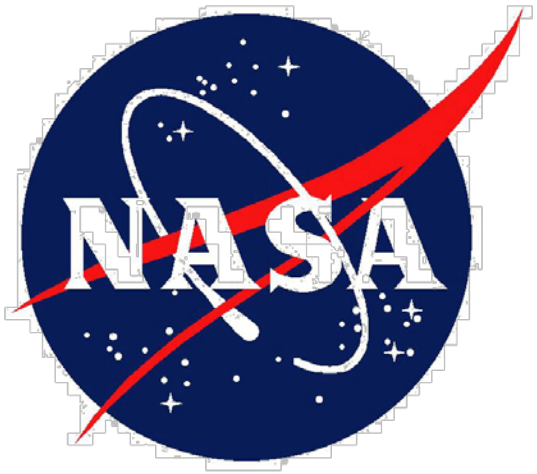




NASA Robotic CARA Metrics: September 2018 Report

Megan Johnson
Ben Moody

CARA Robotic Mission Set

Orbital Regime	Definition	Number of Satellites
LEO #1	Perigee ≤ 500 km & Eccentricity < 0.25	3
LEO #2	500 km < Perigee ≤ 750 km & Eccentricity < 0.25	29
LEO #3	750 km < Perigee ≤ 1200 km & Eccentricity < 0.25	13
LEO #4	1200 km < Perigee ≤ 2000 km & Eccentricity < 0.25	2
MEO	600 min < Period < 800 min & Eccentricity < 0.25	0
GEO	1300 min < Period < 1800 min & Ecc < 0.25 & Inc < 35°	12
HEO	Eccentricity > 0.25	9

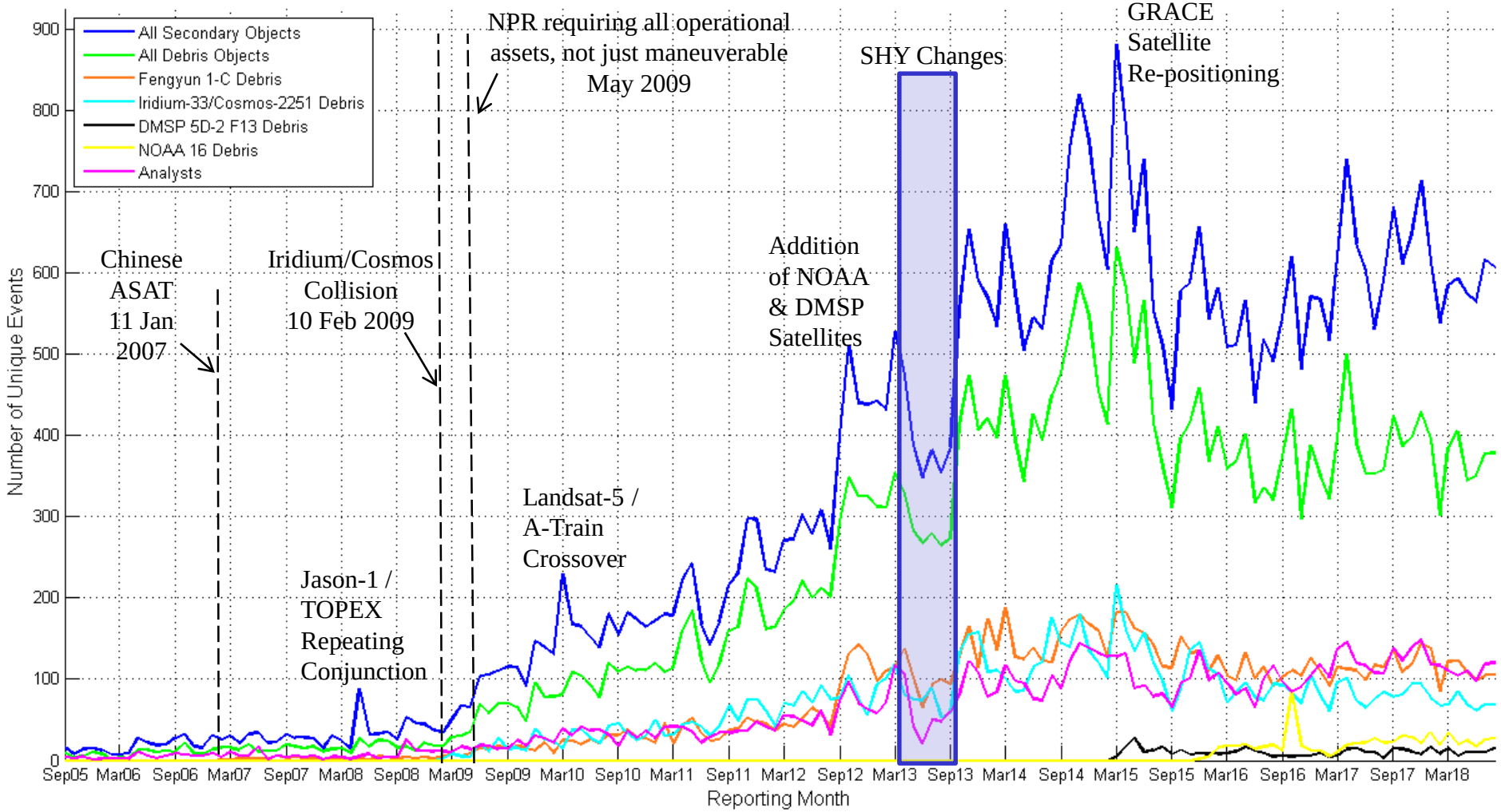
Recent Additions (2)

- GRACE-FO1 (May 2018)
- GRACE-FO2 (May 2018)

Recent Removals (0)

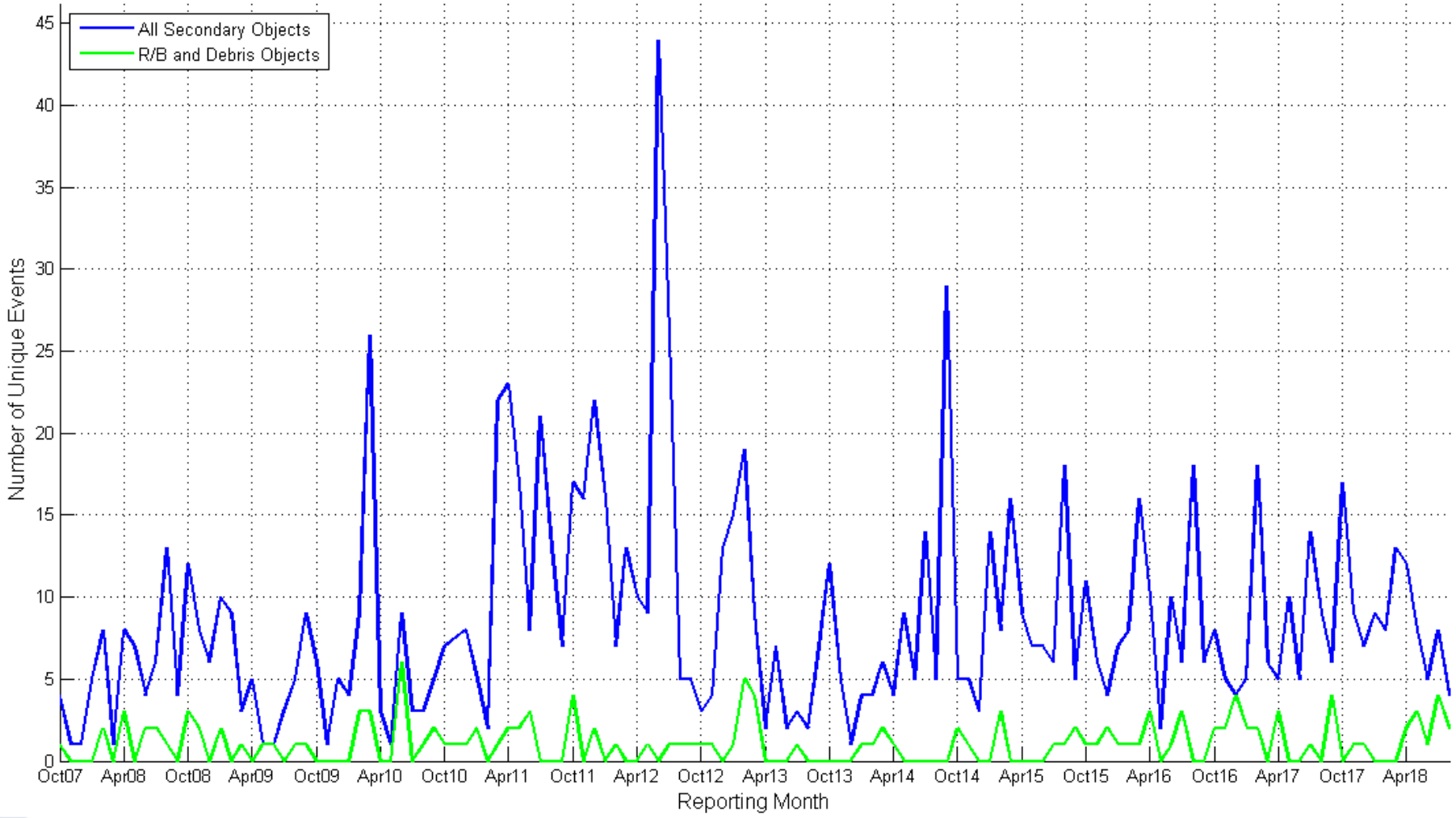
Debris Environment Metrics

Unique Events within 0.5x5x5-km Volume by Object Type, LEO



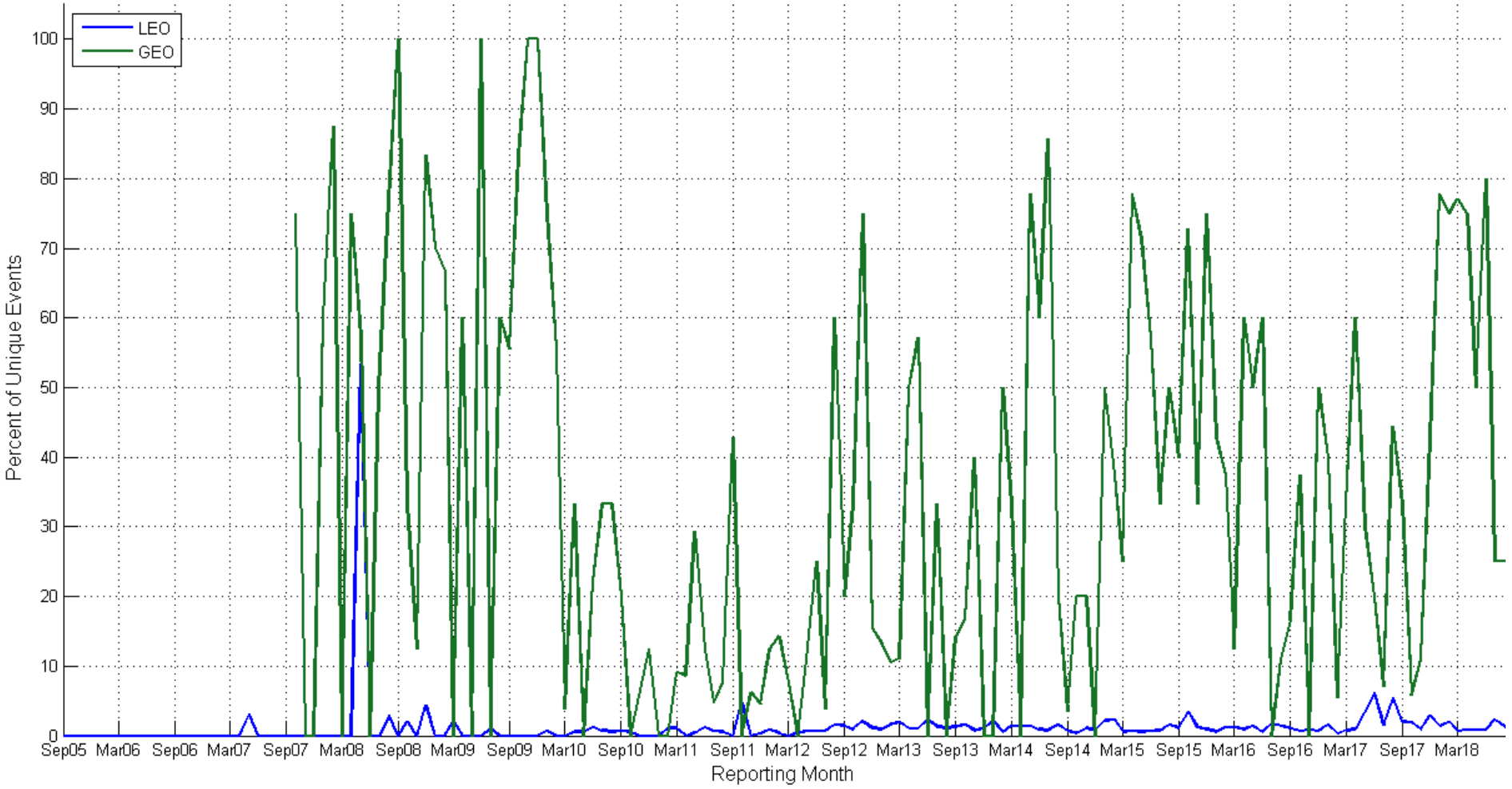
Debris Environment Metrics

Unique Events with 15-km Spherical Volume by Object Type, GEO



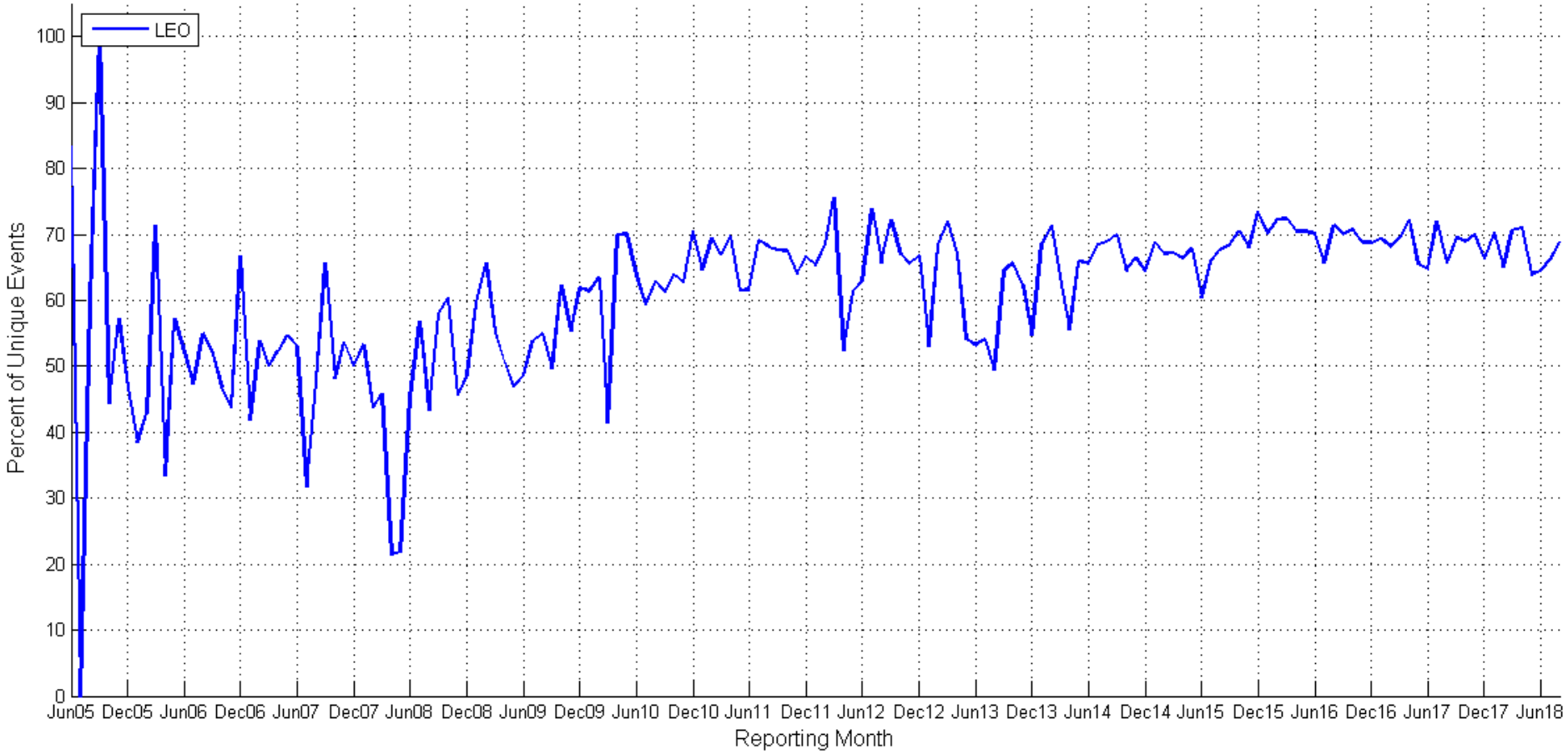
Debris Environment Metrics

Conjunctions Events with “Low” Relative Velocity (< 500 m/s), LEO & GEO

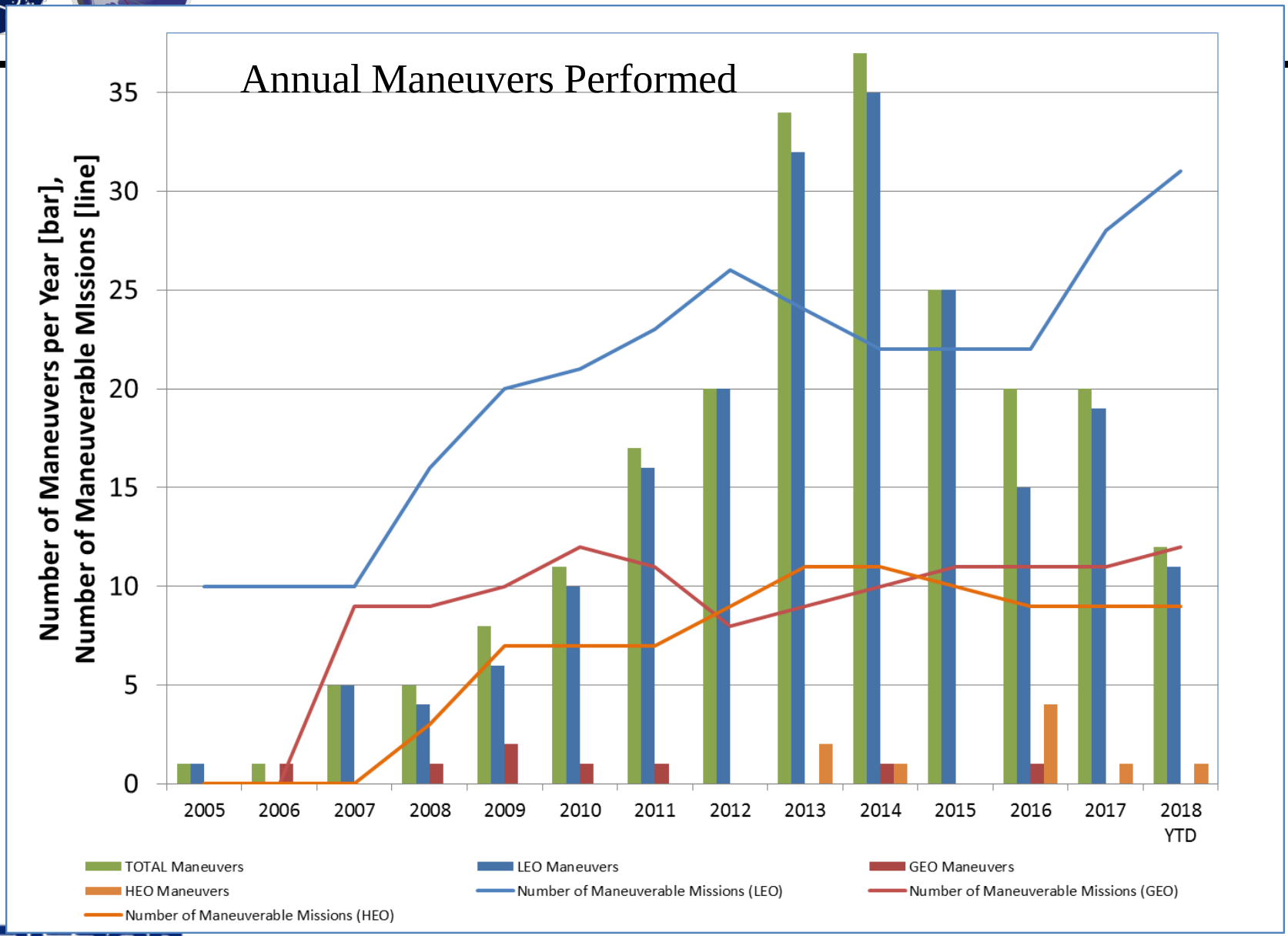


Debris Environment Metrics

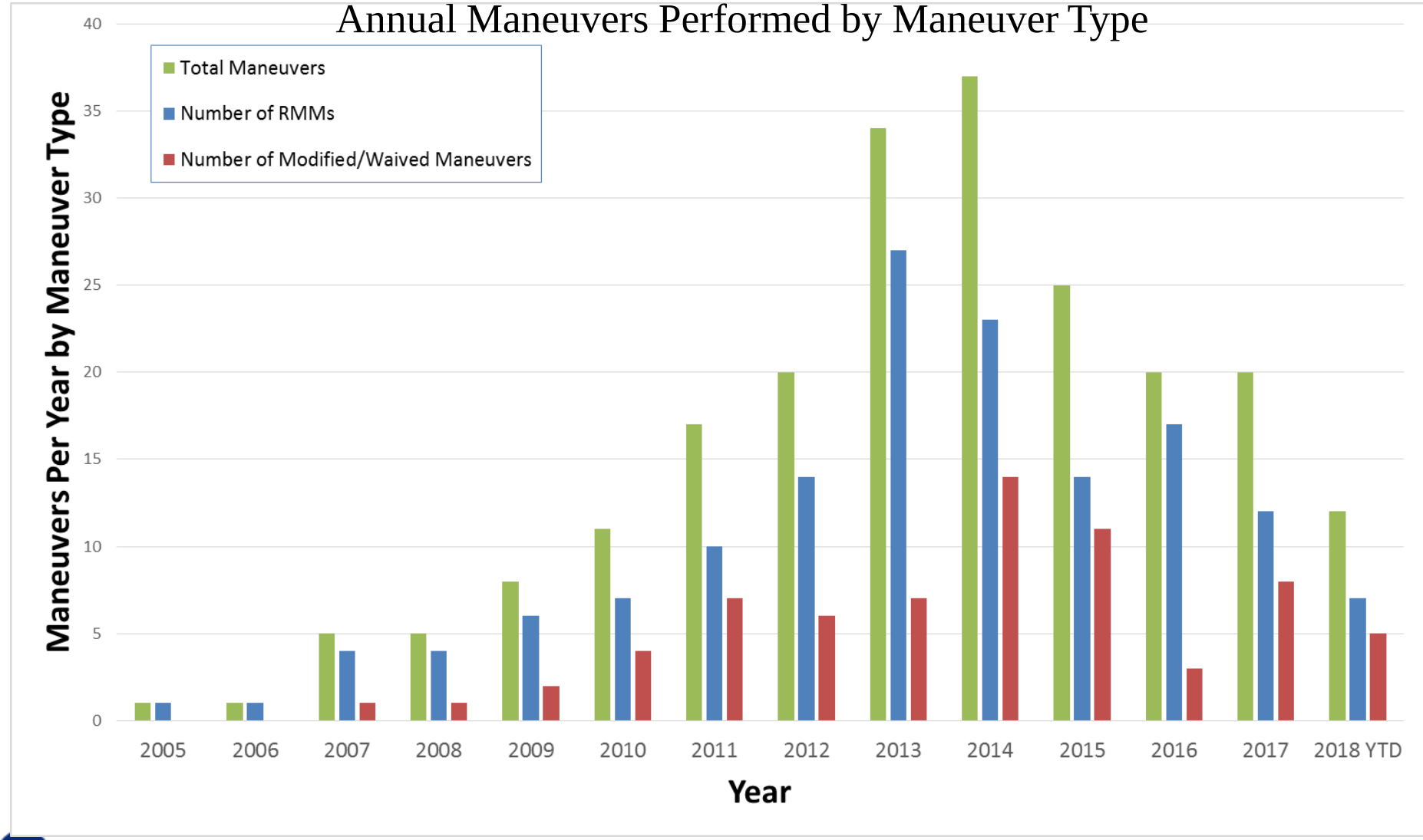
Conjunctions with Small RCS (RCS < 0.02 m^2) Objects, LEO



Workload Metrics

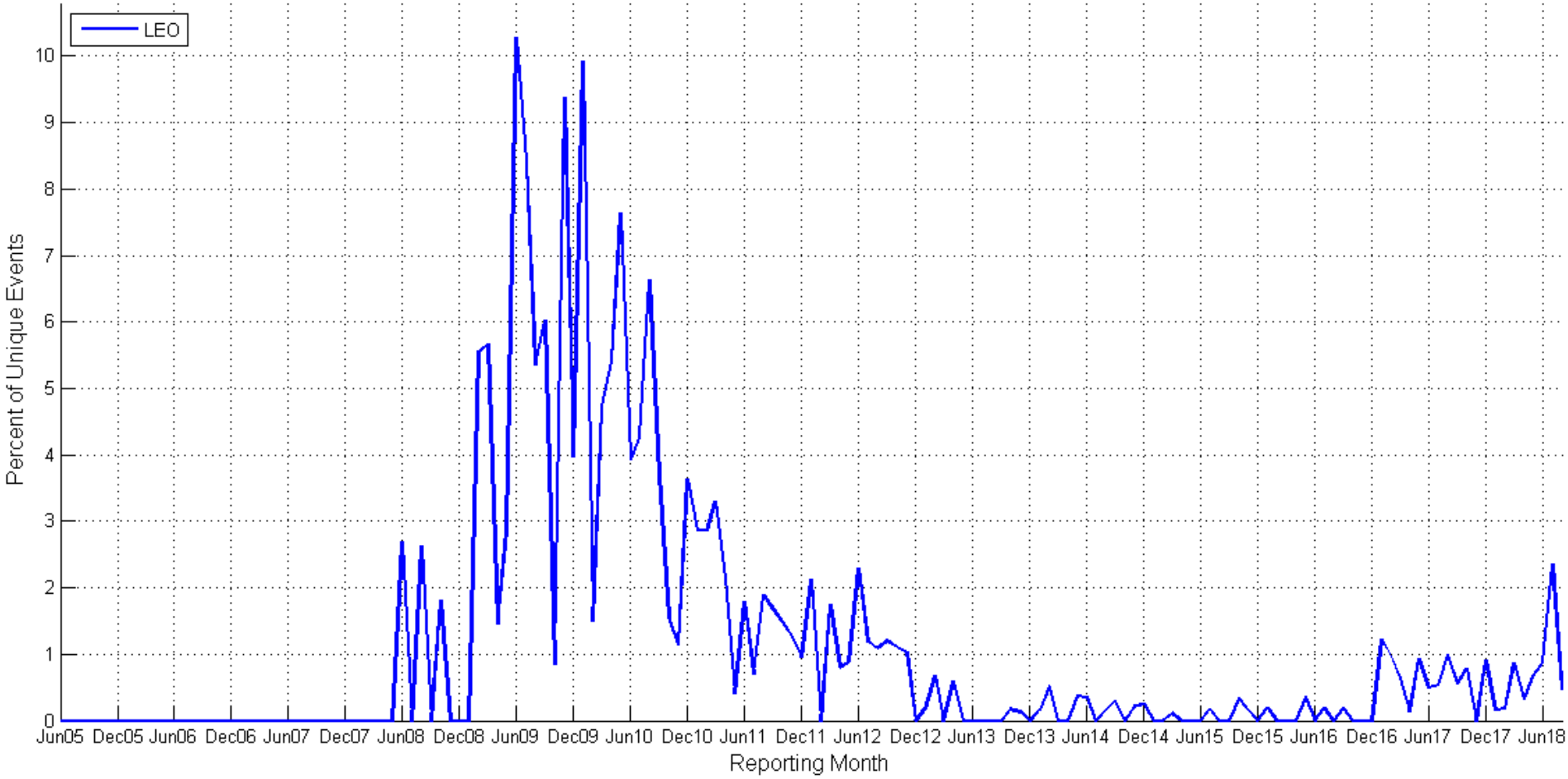


Workload Metrics



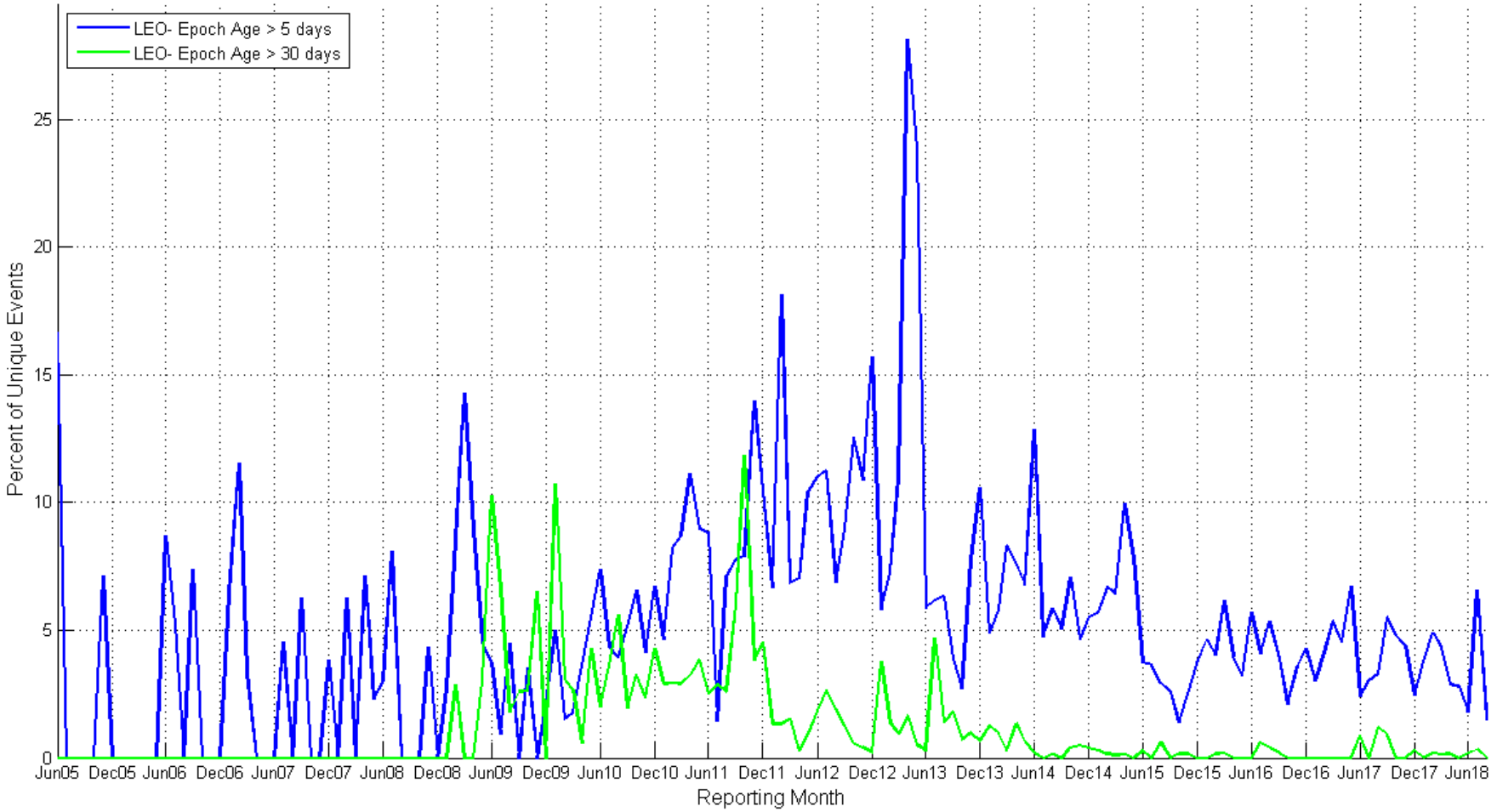
SSN Performance Metrics

Conjunctions Events with Default Covariance, LEO



SSN Performance Metrics

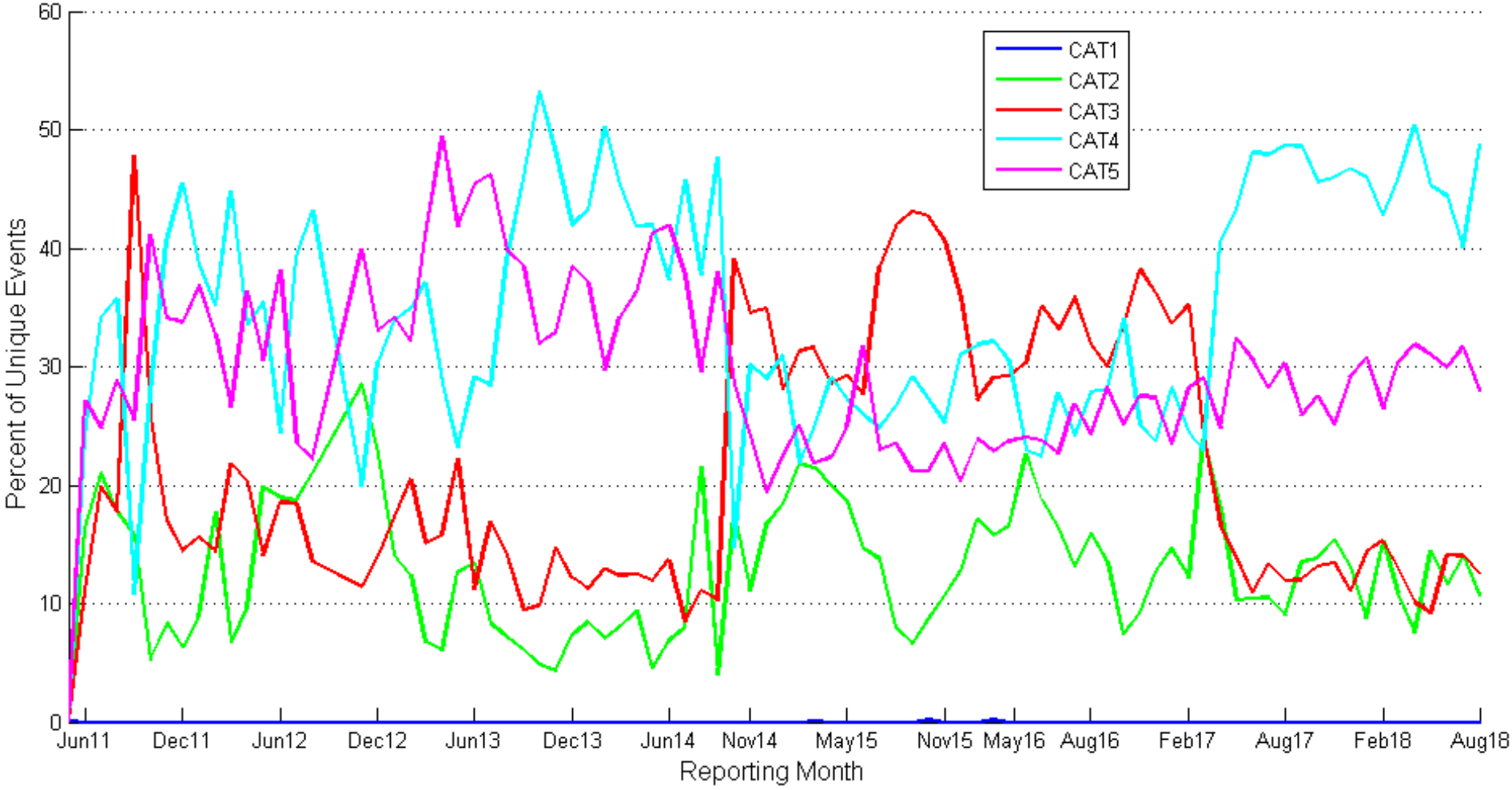
Conjunctions with Objects having Older Epoch Ages, LEO



The epoch age is calculated from the final OCM received prior to event TCA, such that a conjunction whose secondary object's epoch age starts out >5-30 days but then gets tracked during the event, is not counted

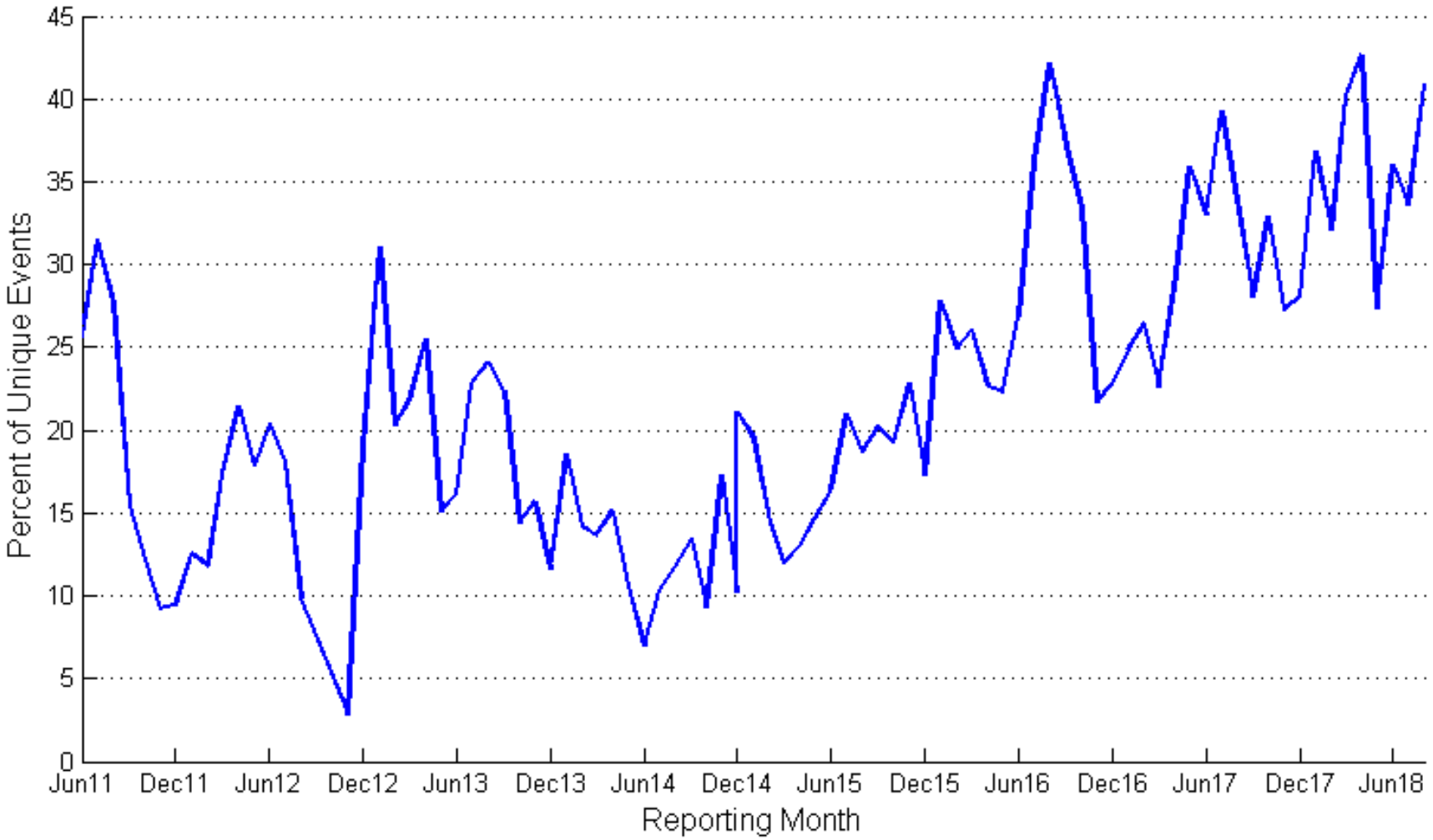
SSN Performance Metrics

Fraction of Highest Tasking Category Achieved during Event, LEO



SSN Performance Metrics

Percent of Events with Realized Tasking CAT Increase on Secondary, LEO



Single-Sensor Tracked Conjunction Events, LEO

