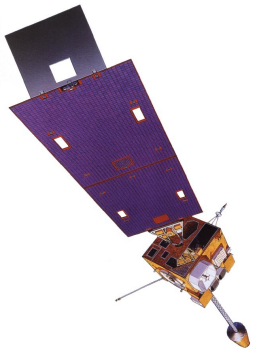
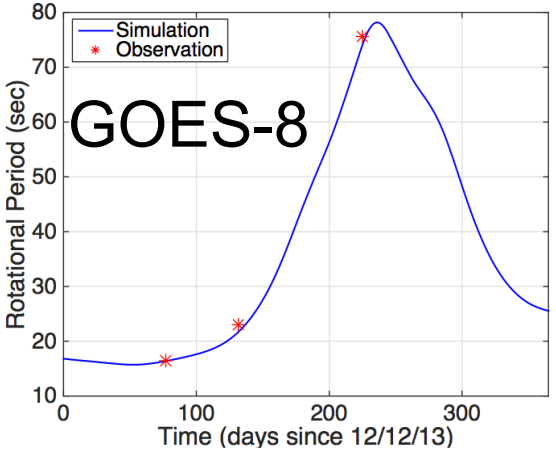
TASK 187. Space Situational Awareness — Ending
TASK 327. RSO System Mechanics — Starting

Large Fluctuations of Spin Period in Defunct GOES-8 Satellite can be accurately fit by modeling Solar Radiation Pressure Effects





•PROJECT AT-A-GLANCE

•UNIVERSITY: University of Colorado at Boulder

•PRINCIPAL INVESTIGATOR: Dr. Dan Scheeres

•STUDENT RESEARCHERS: Several PhD students have been supported by this task over the last few years, most recently CK Venigalla and M. Pellegrino.

RELEVANCE TO COMMERCIAL SPACE INDUSTRY

•Orbit debris remains a fundamental issue for all aspects of space utilization. Specific challenges remain in performing lor term forecasts for specific pieces of orbit debris. While the population of debris is relatively well understood — research advances continue to open new windows on this population.

STATEMENT OF WORK

•Effective space situational awareness faces the challenge of bringing together observations from disparate sensors and sources, developing computationally efficient dynamic propagation schemes for orbits and their uncertainty distributions, and formulating accurate estimation methods for the purpose of quantifying and qualifying space-based activities.

- •Maximize the information extracted from usual sources of SSA data (minimize uncertainty)
- •Identify how data should be collected to maximize information content (maximize efficiency)
- Recover and predict the space domain with more accuracy
- Timely estimation of the space-based environment to create actionable information.

STATUS

- Graduated two FAA-funded PhD students: Kohei Fujimoto, May 2013 & In-Kwan Park Fall 2015, started work with others
- Have a large combined student team focused on relevant SSA research topics of direct interest to the COE
- Presented over 34 distinct papers at 20 conferences
- Over 13 papers published with more in peer review

FUTURE WORK: Task 327 — RSO System Mechanics

- Next proposed stage of direct FAA funded research will focus on predicting space object orbits accounting for uncertainty, improving models for characterizing their dynamics as subject to non-gravitational forces, and investigating optimal evasion maneuvers given a non-zero impact probability.