

Lincoln Labs Seminar

## A System for Predicting Close Approaches and Potential Collisions in Geosynchronous Orbits

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The geosynchronous orbit is getting crowded with over 300 active, revenue-producing large satellites and over 500 inactive resident space objects that pose a physical collision threat to the active satellites. The *in situ* demise of a particular satellite, Telstar 401, followed by a similar demise of SOLIDARIDAD 1, initiated a research and development effort at MIT Lincoln Laboratory to address this threat. This work with commercial satellite operators is accomplished using the mechanism of Cooperative Research and Development Agreements. Initial work to detect and warn of close approaches with these two failed satellites led to more extensive research on the collision threat over the entire geosynchronous belt. It is apparent that:

- a. There is a significant probability of collision;
- b. The probability has increased considerably in the last decade or so;
- c. The continuing failure of geosynchronous satellites and injection of rocket bodies into or near geosynchronous orbit will increase the threat; and
- d. Debris in or near geosynchronous orbit poses another problem that has to be addressed.

This seminar surveys what has been achieved so far in predicting the threat and protecting satellites. An assessment of the probability of collision is presented as well as a description of the Geosynchronous Monitoring and Warning System (GMWS). The operations of the GMWS, as well as some of the results achieved so far, are described. Areas of current research are mentioned.

Bechtel Collaboratory, Discovery Learning Center

Engineering Center

Monday, March 17, 2008

12:00pm

*Light refreshments will be served!*