1070-34-199   **Eric M Wahl***, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA
02420. *Estimating the future position uncertainty of an earth-bound satellite using the
Clohessy-Wiltshire-Hill equations.*

Suppose we have an estimate of an Earth-orbiting object's state (position and velocity) and a measure of our uncertainty in this estimate in the form of a covariance matrix. We can propagate both the state and covariance by numerical integration of a differential equation which models drag and other perturbative forces, however propagating covariance matrices in such a manner can be very computationally intensive.

I will discuss a linearization of the two body problem, the Clohessy-Wiltshire-Hill (CWH) equations, and how they can be used to more efficiently propagate a covariance matrix. I will then quantify the accuracy of this linear approximation using simulated observations of the European Space Agency satellite Envisat. (Received February 11, 2011)