Between Earth and Space: Data Assimilation and Predictability of the Aerospace Environment

The Earth’s upper atmosphere is a critical juncture between the Earth and space. Both space and terrestrial weathers impact its conditions, which in turn affect a number of modern technologies and infrastructures, including satellite, aircraft and spacecraft operations as well as telecommunication, navigation and positioning. To fully address the predictability of the aerospace environment seamlessly from the Earth’s surface to the edge of space, it is important to systematically integrate observations into an Earth-geospace system model through data assimilation. The state estimation problem at hand is often challenged by the high-dimensionality and nonlinearity of dynamical systems as well as by the high volume of observational data. This talk will demonstrate how unobserved upper atmosphere states can be inferred from remote sensing observations such as from GPS receivers on the low Earth-orbiting platforms and FUV imagers at geostationary orbit, and how upper atmosphere predictability can be extended though data assimilation.

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Onizuka Conference Room

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