1077-93-2730   **Humberto C. Godinez*** (`hgodinez@lanl.gov`), Los Alamos National Laboratory, Applied Mathematics and Plasma Physics, Mail Stop B284, Los ALamos, NM 87545. *Data Assimilation for Dynamical Systems.*

Data assimilation methods combine information from a model, observational data, and relevant error statistics to produce an improved state of the model. These methodologies are widely used to produce accurate forecast of atmospheric weather, climate, ocean circulation, and space weather models, to name a few. In this talk we present how data assimilation is used for complex dynamical systems and the various considerations for its effectiveness. We discuss the various factors that influence the success of assimilation, such as the quantity and quality of the observations, errors in initial conditions and/or input parameters, and model uncertainty. The Lorenz 40-variable system and the coupled Lorenz 2-scale system, are taken as test models for assimilation. A twin-experiment is preformed where artificial observations are produced from a reference run, and assimilated using an ensemble-based data assimilation method. From the results it is noted that the accurate description of model and observation uncertainty plays a crucial role for the success of the assimilation. Additionally, for the coupled system, it is found that the coupling between variables of different time scales affects the assimilation, where a strong coupling may adversely impact the assimilation. (Received September 22, 2011)