1123-60-28 **Michele De La Chevrotiere*** (mdelachev@psu.edu), Penn State University Mathematics Dept., University Park, State College, PA 16802, and **John Harlim** (jharlim@psu.edu), Penn State University Mathematics Dept., University Park, State College, PA 16802. *A data-driven method for improving the correlation estimation in serial ensemble Kalman filters.*

Ensemble Kalman filters (EnKF) with small ensemble size tend to induce spurious long-range correlations in the ensemble approximation of the model covariance. The typical approach to this long standing issue consists of using space localization techniques that effectively reduce the spurious correlations. Many such techniques have been proposed, for instance with the tapering functions of Furrer and Bengtsson (2007) or the Gaspari and Cohn localization functions (1999). While these techniques have been very useful, they require exhaustive tuning and present challenges when applied to nonlinear observations. Recently, Anderson and Lei (2013) have introduced an approach based on empirical localization functions (ELF) that requires almost no tuning. However, ELF are constructed in stages and have limitations when applied to large atmospheric models. Motivated by this approach, we present a data-driven method for improving the sample correlation estimation in the EnKF when small ensemble size is used. In particular, we find a linear map that takes the poorly estimated sample correlation in each EnKF cycle and transforms it into a sample of improved correlation. This talk will present an overview of the method and results obtained with the Lorenz-96 model. (Received August 03, 2016)