1096-62-2481 **Jan Mandel*** (jan.mandel@ucdenver.edu), University of Colorado Denver, Campus Box 170, PO Box 173364, Denver, CO 80217-3364, and **Jonathan D. Beezley**, **Loren Cobb** and **Evan Kwiatkowski**. *Convergence of the ensemble Kalman filter in the large sample limit and in high and infinite dimension.*

The ensemble Kalman filter is often used in weather forecasting, oceanography, and other applications. Convergence to the filtering distribution in the large ensemble asymptotics is of particular interest in the case of a high-dimensional state space. It is commonly believed that the convergence to the filtering distribution deteriorates with increasing dimension of the state space (the "curse of dimensionality"). Yet, modest ensemble sizes are often sufficient in geoscience applications even for very large problems, where the state consists of solutions of partial differential equations discretized on large grids. The reason for this behavior becomes clear when the convergence of the state probability distribution is expressed in the appropriate function space. We provide a convergence analysis that is independent of the dimension of the state space, and remains valid in infinite-dimensional Hilbert space. The data is either finite dimensional, or the data error is white noise, which keeps the filter stable. Versions of the analysis apply to the ensemble Kalman filter with perturbed data, and to unbiased ensemble square root filters. This work was supported by NSF grants EGS-0835579, DMS-1216481, and GACR grant 13-34856S. (Received September 17, 2013)