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Levi D. DeVries* (lddevrie@gmail.com) and **Derek A. Paley**. *Observability-based Optimization of Controlled Sampling Formations for Flowfield Estimation*. Preliminary report.

Unmanned, mobile platforms are effective environmental sampling vehicles that can shed light on spatiotemporal processes in nature. Sampling performance can be increased by coordinating the motion of vehicles to target measurements in information-rich but under-sampled regions of the environment. This presentation describes recent results in multi-vehicle control, observability optimization, and flowfield estimation for data assimilation. Decentralized, multi-vehicle control algorithms provide families of vehicle sampling formations parameterized by a minimal number of scalar quantities. We optimize the formation parameters using measures of empirical flowfield observability as a scoring metric, which improves flowfield estimation performance. (Received January 28, 2014)