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SPEAKER TITLES/ABSTRACTS

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"An Overview of the Computational Process for Generating Covariance Matrices for Atmospheric Inverse Modeling of Trace Gas Fluxes"

Trace gas batch inverse problems are often formulated in a Bayesian framework that require minimization of an objective function that takes as an input atmospheric measurements of trace gas concentrations, prior estimates of fluxes, and a transport operator that describes the influence of the sources of fluxes on measurements. As part of minimization, batch inverse problems require computation of covariance matrices that describes the error in measurements and prior fluxes. Most of the computational/data bottlenecks in these inverse problems occur in estimating the transport operator that require processing of terabytes of output generated from a Weather model. Typically, this output is stored on tape storage system that needs to copied or moved into an intermediary storage system for computing the transport operator and finally the covariance matrices that are used in inverse problems. This operation of bringing data to the algorithm is an inefficient and time-delaying way to solve these problems and therefore necessitates development of methods that can work on partitioned observations and transport operator and compute covariance matrices and inverse estimates of fluxes at locations of data storage.