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**Samy Wu Fung\*** ([samy.wu@emory.edu](mailto:samy.wu@emory.edu)) and **Lars Ruthotto**. *An Uncertainty-weighted ADMM Method for Multiphysics Parameter Estimation*.

In this work, we accelerate the convergence of the global variable consensus ADMM algorithm for solving large-scale parameter estimation problems coupling different physics. The idea of global variable consensus is to partition the joint estimation problem into subproblems associated with each PDE, which can be solved individually and in parallel. This allows one to use tailored parameter estimation methods for each problem and is thus attractive for large-scale problems involving complex interactions of multiple physics. A well-known drawback of global variable consensus ADMM is its slow convergence, particularly when the number of workers grows (i.e., a large number of subproblems). To overcome this problem, we propose a new weighting scheme in the algorithm that accounts for the uncertainty associated with the solutions of each subproblem. The uncertainty information can be obtained efficiently using iterative methods, and we demonstrate that the weighting scheme improves convergence for a large-scale multi-physics inverse problem involving a travel time tomography and DC-resistivity survey. (Received January 24, 2019)