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Akil Narayan* (akil.narayan@umassd.edu), 285 Old Westport Road, North Dartmouth, MA 02818, and **Dongbin Xiu, Xueyu Zhu** and **Claude Gittelsohn**. *Simulation of parameterized differential systems with multi-fidelity models.*

We present a novel algorithm for robustly incorporating inexpensive low-fidelity models and data into expensive high-fidelity simulations of differential equations. Our approach maintains high-fidelity model accuracy while requiring only low-fidelity computational effort. The method is non-intrusive and extensible, effectively working with black-box simulation tools. Our procedure can address multi-physics situations, missing parameters, and an arbitrary number of models with varying degrees of fidelity. (Received December 23, 2014)