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Data-based adjoint and H2 optimal control of the Ginzburg-Landau equation[1] MICHAEL BANKS, DANIEL BODONY, Univ of Illinois - Urbana — Equation-free, reduced-order methods of control are desirable when the governing system of interest is of very high dimension or the control is to be applied to a physical experiment. Two-phase flow optimal control problems, our target application, fit these criteria. Dynamic Mode Decomposition (DMD) is a data-driven method for model reduction that can be used to resolve the dynamics of very high dimensional systems and project the dynamics onto a smaller, more manageable basis. We evaluate the effectiveness of DMD-based forward and adjoint operator estimation when applied to H2 optimal control approaches applied to the linear and nonlinear Ginzburg-Landau equation. Perspectives on applying the data-driven adjoint to two phase flow control will be given.

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