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Zhu Wang* (wangzhu@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *Structure-Preserving Galerkin POD Reduced-Order Modeling of Hamiltonian Systems.*

The proper orthogonal decomposition reduced-order models (POD-ROMs) have been widely used as a computationally efficient surrogate models in large-scale numerical simulations of complex systems. However, when it is applied to a Hamiltonian system, a naive application of the POD method can destroy its Hamiltonian structure in the reduced-order model. In this talk, we develop a new reduce-order modeling approach for the Hamiltonian system, which uses the traditional framework of Galerkin projection-based model reduction but modifies the ROM so that the appropriate Hamiltonian structure is preserved. We develop a rigorous a priori error estimate of the new ROM and demonstrate its effectiveness in several numerical examples. This approach can be readily extended to dissipative Hamiltonian systems, port-Hamiltonian systems etc. (Received September 05, 2016)