

Structure preserving discretization of port-Hamiltonian systems

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Port-Hamiltonian systems are a generalization of Hamiltonian systems that allow for the inclusion of inputs and outputs. Port-Hamiltonian systems offer a simple paradigm for modelling complex physical systems by the energy-consistent interconnection of a (possibly large) number of simple subsystems. This approach can also be viewed as a technique for control design. The structure-preserving (and in particular passivity-preserving) integration of this generalization of Hamiltonian systems is of interest both from a theoretical perspective, and in engineering applications. We present some results on structure preserving discretization of port-Hamiltonian systems.