Data-driven modeling of fluids
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Fluid flows can be extraordinarily complex, and even turbulent, yet often there is structure lying within the apparent complexity. Understanding this structure can help explain observed physical phenomena, and can help with the design of control strategies in situations where one would like to change the natural state of a flow. This talk addresses techniques for obtaining simple, approximate models for fluid flows, using data from simulations or experiments. We discuss and compare a number of methods for obtaining linear or nonlinear models, and apply the methods to several flows with complex behavior.