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Physically-Constrained Data-Driven Corrected Reduced Order Modeling of Fluid Flows.

In this talk, we present two approaches for enforcing better conservation properties for reduced order models (ROMs) of fluid flows. In the first approach, to construct the centering trajectory, we use the Stokes extension instead of the standard snapshot average. We show that the Stokes extension yields significantly more accurate results. In the second approach, we enforce physical constraints in the data-driven modeling of the ROM closure term. The constrained data-driven ROM is significantly more accurate than its unconstrained counterpart. (Received August 03, 2018)