

Abstract Submitted
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Generalized mean-field model of oscillatory flow using continuous mode interpolation¹ BERND R. NOACK, Berlin University of Technology, Germany, MAREK MORZYNSKI, WITOLD STANKIEWICZ, Poznan University of Technology, Poland, GILEAD TADMOR, Northeastern University, Boston, USA — A ‘least order’ Galerkin model is proposed for the transient and post-transient cylinder wake targeting model-based flow control. The underlying Galerkin approximation comprises two mean-flow dependent modes representing the developing von Kármán vortex street and the shift mode resolving mean-flow changes. A continuous mode interpolation between global stability eigenmodes and POD modes enables a uniformly accurate flow prediction during the whole transient from steady to periodic state. Additionally, the shift mode and the interpolated oscillatory modes are derived from first principles employing a generalized mean-field theory.

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