Critical properties of forced wakes GILLES BOUCHET, IMF Strasbourg, BENJAMIN THIRIA, JOSÉ E. WESFREID, PMMH-ESPCI (UMR7636 CNRS), IMF COLLABORATION, PMMH COLLABORATION — We present direct numerical simulations of a flow behind an oscillating cylinder around its axis, at moderate Reynolds number. This flow geometry represents the very typical situations observed in flow control studies. We worked on lock-in and non lock-in regimes and, in this latter case, we analyzed the critical behavior of the global mode as a function of the forcing amplitude, as well as the forcing frequency. We confirmed the results of previous experimental works dealing with the scaling properties of theses global modes, scaling with the growth rate of perturbations, themselves depending on forcing parameters. Owing to the scaling, we have been able to renormalize the global modes.

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