Distributed dynamic phasors in empirical Galerkin models for separated flows over an airfoil[1] GILEAD TADMOR, Northeastern University, BERND R. NOACK, Berlin University of Technology, MAREK MORZYNSKI, Poznan University of Technology, DONATELLA CENTUORI, Northeastern University — A low order Galerkin model is proposed for the flow over an airfoil. The model includes modes representing the shedding and actuation frequencies and base flow dynamics. The method addresses the difficulty of POD techniques to capture distinct harmonics in dedicated modes during transients, diminishing the link to flow physics and the efficiency of a minimal order model. Dynamic phasors representations capture transient behavior of periodic characteristics in periodically dominated systems. In a distributed variant, they are suggested as natural tools to identify and extract distinct periodic contributions to dominant modes, and are used in conjunction with subsequent POD analysis.

Gilead Tadmor
Northeastern University

Date submitted: 04 Aug 2006   Electronic form version 1.4