Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Computational study of active control of aeroelastic flutter using synthetic jets HANSONG LIU, JUNG-HEE SEO, RAJAT MITTAL, Johns Hopkins University — Aeroelastic flutter is an important phenomenon in a variety of applications including aircraft design and hydrokinetic energy harvesting. Active flow control is one possible approach to suppress or enhance aeroelastic flutter. Zero-net-mass flux synthetic jet have unique properties that enable a variety of applications in flow control such as suppression of flow separation and drag reduction and in the current study, we show that synthetic jets also have the potential to control aeroelastic flutter. We use computational modelling with a sharp-interface immersed boundary method to model the air flow over a pitching airfoil and to investigate the effects of synthetic jet actuation on aeroelastic flutter of the airfoil. The concept of energy maps that quantify the energy exchange between the elastic structure and the flow, are used to guide and optimize the synthetic jets for flutter suppression.

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Date submitted: 04 Aug 2020 Electronic form version 1.4