Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

**Effect of spanwise wall oscillations on dynamics and evolution of near-wall coherent structures in a turbulent pipe flow at low and moderate Reynolds numbers**[1] DANIEL COXE, RONALD ADRIAN, YULIA PEET, Arizona State University — Presented is the temporal evolution of a single conditional hairpin vortex in a turbulent pipe flow with transversely oscillated walls at low and moderate Reynolds numbers, compared to a baseline non-oscillated turbulent pipe flow case. A conditional hairpin is generated by a Linear Stochastic Estimation of a fluctuating velocity field of a non-oscillated pipe flow, obtained via Direct Numerical Simulations with a spectral-element method. An extracted hairpin is placed as an initial condition into the flow of interest and is convected downstream by a turbulent mean velocity profile. A goal of the study is to investigate the effect of wall oscillations on the development and growth of a conditional hairpin and the mechanisms associated with a potential suppression of auto-generation in a drag reduced flow. Subsequent formation and evolution of secondary and tertiary hairpins and how these processes are modified by a spanwise wall oscillation are also documented. A spatially averaged Reynolds stress profile along with the wall shear stress are presented to quantify the effects of auto-generation.

[1]This work used the Extreme Science and Engineering Discovery Environment (XSEDE), which is supported by National Science Foundation grant number TG-ENG150019

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Date submitted: 31 Jul 2019 Electronic form version 1.4