

Abstract Submitted
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Streamwise development of targeted coherent structures in turbulent pipe flow TYLER VAN BUREN, University of Delaware, LEO HELLSTROM, Princeton University, IVAN MARUSIC, University of Melbourne, ALEXANDER SMITS, Princeton University — Our aim is to perturb specific naturally occurring energetic modes in turbulent pipe flow ($Re_{\tau} = 3486$) using sections of pipe with a periodic non-circular cross-section. We track the downstream development of these perturbations with stereoscopic particle image velocimetry. Cross-sections with an azimuthally varying radius (sinusoidal) delicately agitate the flow through excitation of the Reynolds stresses. These sections significantly alter the mean flow, and add energy in the targeted structures while simultaneously reducing the energy in the non-excited structures. Supported under ONR Grant N00014-15-1-2402, Program Manager/Director Thomas and the Australian Research Council.

Tyler Van Buren
University of Delaware

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