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Using LCS to identify vortex shedding on a cylinder in cross-flow

MELISSA GREEN, Syracuse University — The transition from steady separation to unsteady vortex shedding downstream of a circular cylinder in cross-flow is examined using a Lagrangian coherent structure analysis. Velocity data is gathered from both 2D and 3D simulations at a Reynolds number shortly after transition ($Re = 100$). At transition, when flow begins to entrain into and detrain from the cylinder wake, the wake as described using LCS undergoes a distinct qualitative change. This event in the evolution of the LCS will offer new information about possible timing and location at which to implement effective flow control to mitigate the shedding and unsteady forces on the cylinder body.

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