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Point vortex modeling of symmetric four vortex wakes SAIKAT BASU, MARK STREMLER, Virginia Tech — Bluff body wakes frequently display different complex patterns. Our previously disseminated results introduced a point vortex model for the 2P wake configuration, which is one of the most commonly observed wake patterns and consists of two staggered rows of vortex pairs. In this talk, we present our findings for the related case of a symmetric 2P-like wake configuration. The pattern consists of two pairs of counter-rotating vortices placed symmetrically about the wake centerline in a singly-periodic domain. Due to the assumed symmetry of the wake we are able to model the vortex dynamics as an integrable Hamiltonian system. The mathematical analysis reveals some interesting and novel relative vortex motions that we will discuss. The model results will be compared against experimental wakes from the literature. As with our staggered 2P wake analysis, the model results suggest that the classification of these exotic wakes should include more than just the number of vortices shed by the body.

Saikat Basu
Virginia Tech

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