

Abstract Submitted
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Stirring with ghost rods in a lid-driven cavity PANKAJ KUMAR, JIE CHEN, MARK STREMLER, Virginia Tech — It has shown that passive fluid particles moving on periodic orbits can be used to ‘stir’ a viscous fluid in a two-dimensional lid-driven cavity that exhibits a figure-eight flow pattern (Stremler & Chen 2007). Fluid motion in the vicinity of these particles produces “ghost rod” structures that behave like semi-permeable rods in the flow. Since these ghost rods are present due to the system dynamics, perturbations in the boundary conditions lead to variations in the existence and structure of the ghost rods. We discuss these variations and assess the role of ghost rods in mixing over a range of operating conditions for this system. The results suggest that ghost rods can play an important role in mixing for other counter-rotating flows.

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