

Abstract Submitted
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Topological Optimization of Rod Mixers¹ MATTHEW D. FINN,
JEAN-LUC THIFFEAULT, Imperial College London — Stirring of fluid with moving rods is necessary in many practical applications to achieve homogeneity. These rods are topological obstacles that force stretching of fluid elements. The resulting stretching and folding is commonly observed as filaments and striations, and is a precursor to mixing. In a space-time diagram, the trajectories of the rods form a braid [1], and the properties of this braid impose a minimal complexity in the flow. We discuss how optimal mixing protocols can be obtained by a judicious choice of braid, and how these protocols can be implemented using simple gearing [2].

[1] P. L. Boyland, H. Aref, and M. A. Stremler, *JFM* 403, 277 (2000).

[2] J.-L. Thiffeault and M. D. Finn, <http://arxiv.org/nlin/0603003>

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