

Abstract Submitted  
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**Effect of scalar-field boundary conditions on the Markovian properties of passive scalar increments**<sup>1</sup> JASON LEPORE, LAURENT MYDLARSKI, McGill University — Lepore and Mydlarski<sup>2</sup> recently investigated the influence of the scalar-field boundary conditions on the inertial-convective-range scaling exponents of the high-order passive scalar structure functions ( $\xi_n$ ). The latter was accomplished by injecting the scalar field into the flow (i.e., the turbulent wake of a circular cylinder) using two different scalar injection methods: (i) heating the cylinder, and (ii) using a “mandoline”. The authors concluded that all previous estimates of  $\xi_n$  are sensitive to the scalar field boundary conditions, given the finite Reynolds numbers of the flows under consideration, and, therefore, do not constitute a universal measure of the internal intermittency of the passive scalar field. The present work examines the Markovian properties of passive scalar increments, and their dependence on the scalar injection method, to provide additional insight into the small-scale structure of the turbulent passive scalar. In particular, the current research examines the relationship between the high-order terms of the Kramers-Moyal expansion and the internal intermittency of the passive scalar field.

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<sup>2</sup>Lepore and Mydlarski, 2009, *Phys. Rev. Lett.*, **103**, 034501.

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