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Markovian properties of the turbulent acceleration OLIVER KAMPS, Institute for Theoretical Physics, University of Muenster, Muenster, Germany, HOLGER HOMANN, Observatoire de la Cote d'Azur, Nice, France, RUDOLF FRIEDRICH, Institute for Theoretical Physics, University of Muenster, Muenster, Germany, RAINER GRAUER, Institute for Theoretical Physics I, University of Bochum, Bochum, Germany — In recent years it has been shown that by exploiting the Markovian properties of the velocity increments it is possible to extremely reduce the information necessary to describe the Eulerian velocity statistics. This approach, motivated by the theory of stochastic processes, is even more natural to the Lagrangian view of turbulence. Nevertheless a systematic analysis of the Markovian properties of Lagrangian observables is still missing. In this talk we focus on the acceleration of Lagrangian tracer particles which is a central quantity in fundamental and applied turbulence research. Based on data from numerical simulations of the Navier-Stokes equation we investigate two and three time joint probability distributions of acceleration time series in order to estimate the time scale where the process becomes Markovian. Additionally we use this information to reconstruct the intermittent cascade of Lagrangian velocity increments.

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