

# Anomalous Dependence on System size of Large Deviation Functions for Empirical measure

Naoto Shiraishi

Department of Basic Science, The University of Tokyo

In this study, we treat the large deviation function for occupation times at one point in spatially extended systems. We find that some systems exhibit an anomalous dependence of the large deviation function on the system size. These systems satisfy the following three conditions: (i) they have translational symmetry, (ii) there exists no macroscopic flow, and (iii) their space dimension is one or two. We elucidate, based on phenomenological arguments, that the mechanism of this anomaly is mathematically similar to that of the so-called long-time tail behavior. We also apply a contraction principle to the large deviation function for occupation times in the whole space, in order to show that we can understand how the anomaly occurs in the contraction.