

ASEPs through a quadratic harness representation

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I will show how the generating function of sites occupation in the ASEP (asymmetric simple exclusion process) can be represented in terms of joint moments of special stochastic processes called quadratic harnesses. Quadratic harnesses is a family of processes uniquely defined through their linear conditional expectations and quadratic conditional variances were conditioning is with respect to the past future filtration of the process. The quadratic harness representation allows to derive some new properties of the ASEP which will be discussed in the talk. In particular, it allows to derive the LDP for average sites occupation for a wider family of parameters than known in the literature. This is the joint work with W. Bryc (Univ. of Cincinnati, USA).