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Israel Klich* (isklich@gmail.com) and **Rafael N Alexander**. *From Exact Tensor networks to a new representation of TASEP.*

The use and interest in tensor network methods have rapidly grown in recent years and represents a development of major numerical and analytical tools for the study of quantum states. In spite of an extensive amount of work, until now there have been no demonstration of an exact correspondence between networks of finite dimension (finite dimensionality of the involved tensors) and an actual ground state (or even excited state) of a reasonable (i.e., local) quantum critical Hamiltonian in the thermodynamic limit (such exact examples have only been presented for gapped systems before). In this talk I will describe a tensor network construction of the exact ground state of the quantum Motzkin spin chain. This tensor network exhibits a built in scale invariance, and has a finite bond dimension. I will show that a suitable modification of the network results in a novel representation of the well known steady state measure describing the totally asymmetric exclusion process. (Received January 20, 2020)