

Abstract Submitted
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Many-body spectral moment sum rules for the Bose Hubbard model¹ JAMES FREERICKS, Georgetown University, VOLODOMYR TURKOWSKI, University of Central Florida, HULIKAL KRISHNAMURTHY, Indian Institute of Science — Exact results for many-body interacting systems are rare. Here we derive a series of exact results for the single-band Bose-Hubbard model. In particular, we derive spectral moment sum rules for the Green's functions of the Bose-Hubbard model. Unlike the fermionic sum rules, the bosonic ones depend on complicated expectation values of the bosons that go beyond just needing to know the local particle density. Nevertheless, they can be used to benchmark the quality of different numerical calculations of spectral functions. These sum rules hold with arbitrary values of the interaction strength and even into nonequilibrium situations, similar to what is seen for the fermionic case. We present some case studies comparing the exact moments to those found with other numerical techniques like the VCA approximation.

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