

Abstract Submitted
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Correlation functions of quasi-one-dimensional cold gases in well-defined spin states VLADIMIR YUROVSKY, School of Chemistry, Tel Aviv University — Many-body states of quasi-one-dimensional atoms with zero-range interactions can be grouped into multiplets by the total spin, where two projections of the spin $1/2$ are attributed to the two internal states of each atom. Correlation functions, averaged over the spin multiplets, are expressed here in terms of characters of irreducible representations of the symmetric group. The characters were identified by Dirac [1] as the integrals of motion, related to the permutation symmetry. They can be explicitly expressed in terms of the total spin, corresponding to the irreducible representation. The spin multiplets can be populated using spin-dependent non-stationary potentials and identified by their average correlations. The well-defined spin states, being many-body entangled states, can find applications in quantum computations and metrology.

[1] P.A.M. Dirac, Proc. R. Soc. A **123**, 714 (1929).

Vladimir Yurovsky
School of Chemistry, Tel Aviv University

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