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**A quantum Ablowitz-Ladik hierarchy, q-bosons and q-Whittaker functions**

We construct a solution to the quantum Yang-Baxter equation using q-bosons and show that the transfer matrix of the resulting quantum integrable model satisfies an analogue of Baxter's famous TQ relation with the transfer matrix of the q-boson model of Bogoliubov et al. The q-bosons satisfy a q-deformed, noncommutative analogue of the defocusing Ablowitz-Ladik equation and the quantum integrals of motion are van Diejen's discrete Laplacians for the quantum nonlinear Schroedinger model. For the latter we derive new expressions and a combinatorial interpretation: they generate a commutative Frobenius algebra which for  $q=0$  specialises to the Verlinde algebra (fusion ring) of the  $su(n)$  WZNW model. The partition function of our quantum integrable model yields specialised skew Macdonald functions which are known to coincide with so-called q-Whittaker functions.