

# Quantum cohomology on flag manifolds, finite difference Toda lattices, and quantum groups

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## Abstract

A "completely integrable" system, the finite difference Toda lattices, is constructed from quantum groups  $U_q(\mathfrak{g})$  for any complex simple Lie algebras  $\mathfrak{g}$  by defining a homomorphism from the center of  $U_q(\mathfrak{g})$  to finite difference operators. The image consists of the commuting hamiltonians of the finite difference Toda lattices. (This part will only be briefly sketched.)

We will prove that a generating function of one-point quantum  $K$ -invariants, the  $J$ -function, on (complete) flag manifolds of type  $A_r$  is the common eigenfunction of the commuting hamiltonians. We also conjecture that this statement holds for arbitrary simple Lie algebra.

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