Dispersion estimates for the discrete Laguerre operator

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Abstract. We derive an explicit expression for the kernel of the evolution group of the discrete Laguerre operator (i.e. the Jacobi operator associated with Laguerre polynomials) in terms of Jacobi polynomials. Based on this expression and using the Haagerup–Schlichtkrull inequalities for Jacobi polynomials, we compute the norm of the evolution group acting from ℓ^1 to ℓ^∞. Dispersive estimates of this type are important in the study of stability of noncommutative solitons and the obtained estimates improve some recent results by A. Krueger and A. Soffer. On the other hand, the Haagerup–Schlichtkrull inequalities were derived in order to get uniform bounds on a complete set of matrix coefficients for the irreducible representations of $SU(2)$. Also, we plan to discuss dispersive estimates for generalized Laguerre operators and their relationships with Bernstein-type inequalities for Jacobi polynomials.

The talk is based on a recent joint work with G. Teschl.