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Macdonald operators in superspace and the supersymmetric Ruijsenaars-Schneider model revisited

Luc Lapointe *

lapointe@inst-mat.utalca.cl

The Ruijsenaars-Schneider model describes a system of relativistic particles on a circle. An integrable supersymmetric extension of that model on a discrete Hilbert space was recently introduced, with the conserved quantities given in terms of Cherednik operators. We will show how the conserved quantities can be given in a more explicit form using supersymmetric analogs of the Macdonald operators. We will also present a new symmetry of the Macdonald polynomials in superspace that leads to a scalar product that converges for real values of the parameters q and t present in the model, thus allowing the supersymmetric extension of the Ruijsenaars-Schneider model to be defined on a continuous Hilbert space.

*Instituto de Matemática y Física, Universidad de Talca, Casilla 747, Talca, CHILE