Symmetric functions in superspace

Luc Lapointe [*]

Abstract

A generalization of the theory of symmetric functions arose in connection with the supersymmetric version of the Calogero-Sutherland model of identical particles on a circle. In this framework, one can define superspace analogs of Macdonald, Jack and Schur polynomials. We will give an overview of the combinatorics that has been uncovered so far, putting a special emphasis on certain refinements of the original Macdonald positivity conjectures that seem to shed light on the problem of finding a combinatorial interpretation for the Macdonald (q,t)-Koskta coefficients. We will also present a surprising connection between the 6-vertex model in statistical mechanics and the Pieri rules for Macdonald polynomials in superspace.

[*]Instituto de Matemática y Física, Universidad de Talca. e-mail: `lapointe@inst-mat.utalca.cl`