

Laura Colmenarejo, York University

A toolbox for clustering properties of Macdonald polynomials

The clustering properties of Jack polynomials are involved in the theoretical study of the fractional Hall states as Bernevig and Haldane described. For simplicity, these properties imply that the polynomials factorize completely for some specialization of the variables. In the aim to understand this phenomenon, we adopted the following strategy. First, we consider Macdonald polynomials instead of Jack polynomials. Macdonald polynomials are a deformation with two parameters which degenerates to Jack polynomials. The computational and combinatorial aspects of these polynomials are fully exploited when using non symmetric and/or non homogeneous version of this polynomials. This work is the sequel of a previous paper of J-G. Luque and C. F. Dunkl in which they prove a conjecture of Peter Forrester by investigating the vanishing properties of non symmetric/non homogeneous singular Macdonald polynomials via the Yang-Baxter graph. We prove that these polynomials have very nice factorization properties under some specialization of the variables which generalize the conjecture of Forrester. We illustrate our methods by giving some factorization formulas for staircase or quasi-staircase Macdonald polynomials. This is a work in progress with J-G. Luque and C. F. Dunkl.