Factorial Characters and Tokuyama's Identity for Classical Groups

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Abstract

In this paper we introduce factorial characters for the classical groups and derive a number of central results. Classically, the factorial Schur function plays a fundamental role in traditional symmetric function theory and also in Schubert polynomial theory. Here we develop a parallel theory for the classical groups, offering combinatorial definitions of the factorial characters for the symplectic and orthogonal groups, and further establish flagged factorial Jacobi-Trudi identities and factorial Tokuyama identities, providing proofs in the symplectic case. These identities are established by manipulating determinants through the use of certain recurrence relations and by using lattice paths.

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