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The flagged double Schur function. (English)

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The notion of double Schubert polynomial is an extension to two sets of variables of the notion of "ordinary" Schubert polynomial. The paper under review deals with the class of symmetric double Schubert polynomials corresponding to a class of permutations called Grassmannian permutations. These functions are called double Schur functions by the authors in comparison with the supersymmetric double Schur functions. The double Schur functions are a natural generalization of the functorial Schur functions.
The first result of the paper is a lattice path interpretation of the double Schur function based on a flagged determinantal formula derived from a formula of Lascoux for the symmetric double Schubert polynomial. Such a lattice path construction easily translates into the tableau definition generalizing the original tableau definition of the factorial Schur function. The double Schur functions can be defined in terms of determinants and divided difference operators. The main result of the paper is a combinatorial treatment of the divided difference operators which can be used to compute the double Schur function from a monomial. The authors present a combinatorial interpretation of such divided difference operators acting on a dominant double Schubert polynomial which, together with the lattice path representation, easily gives an operator definition, the tableau interpretation and the determinantal formula of the double Schur function. This approach also extends to the flagged double Schur function. As an application the authors obtain lattice path representations of the tableau definition of the symplectic and orthogonal characters of $sp_{2n}(\lambda, X)$ and $so_{2n+1}(\lambda, X)$ and give flagged determinantal formulas for these characters.

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Keywords : flagged double Schur function; symplectic characters; orthogonal characters
Classification :
∗05E05 Symmetric functions
05E10 Tableaux, etc.
05E15 Combinatorial problems concerning the classical groups
20G05 Representation theory of linear algebraic groups

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