On the classification of multiplicity-free products of Schur functions

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Schur functions are symmetric polynomials introduced by Schur as characters of irreducible representations of the general linear group of invertible matrices. Schur functions can be generated combinatorially using semistandard Young tableaux and form a basis for the ring of symmetric functions. Basically there are three fundamental products on the ring of symmetric functions, namely the ordinary product, the Kronecker product and the plethysm of Schur functions. All these three products of Schur functions are again symmetric functions and can be expressed in terms of Schur functions basis.

We will present the most recent results on various products of Schur functions which are multiplicity-free in the sense that the coefficients which arise in their expansion as a sum of Schur functions are $0, 1$.