Plethysm and lattice point counting

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We show that the coefficient of the Schur functor S^λ in the decomposition of the plethysm $S^\mu(S^k)$ into irreducibles is the solution to a lattice point counting problem. Consequently, for each fixed μ, the solution to this problem is a piecewise quasi-polynomial in (λ, k). We show how to use computer algebra to determine this function explicitly when μ is a partition of 4 or 5. We also discuss asymptotics of the resulting piecewise quasi-polynomials.

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