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Symmetric polynomials, exceptional Lie algebras, and superconformal indices of four-dimensional “class S” quantum field theories.

I will discuss the superconformal index of the class of theories introduced in J. Distler’s talk. The superconformal index is an invariant which counts protected states in a superconformal field theory. This is exact non-perturbative information about the theory, which can be used to test strong-coupling dualities. For a class S theory of type $\mathfrak{j} = ADE$ defined by an n -punctured Riemann surface C , the superconformal index takes the form of an infinite sum involving symmetric polynomials labeled by a representation of \mathfrak{j} and a nilpotent orbit in $\mathfrak{j}_{\mathbb{C}}$. In this talk, I will take a limit of the index in which the symmetric polynomials are given by Hall-Littlewood polynomials, and I will show how to use this limit of the index to classify theories of type $\mathfrak{j} = E_6$. (Received September 20, 2014)