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SYMMETRIC FUNCTIONS ARISING FROM A THETA FUNCTION OF RAMANUJAN

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A trace formula of Amdeberhan-Ono-Singh suggests defining a certain symmetric function $A_n(x)$ with many interesting properties. The coefficients when expanded in terms of the power sum, monomial, forgotten, and Schur symmetric functions, as well as the fundamental quasisymmetric functions, have simple combinatorial interpretations. The expansion in terms of the complete symmetric functions has nonnegative integer coefficients summing to the number of alternating permutations of $1, 2, \ldots, 2n$, but a combinatorial interpretation is unknown. These results can be considerably generalized.

This is joint work with Tewodros Amdeberhan and John Shareshian. A basic knowledge of symmetric functions will be assumed.