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## Higher Bessel functions: some new results

*Friday, June 28, 2024 10:00 AM (1 hour)*

We consider the generating function  $\Phi^{(N)}$  for the reciprocals  $N$ -th power of factorials (Higher Bessel functions = solutions  $P^{N-1}$  «quantum» DE). We show a connection of product formulas for such series with the periods for certain families of algebraic hypersurfaces. We describe the singular loci of these surfaces and show that they are given by zeros of the Buchstaber-Rees polynomials, entering in  $N$ -valued group laws. We propose a generalized Frobenius method and use it to obtain special expansions for multiplication kernels in the sense of Kontsevich. Using these expansions we provide some experimental results to connect  $N$ -Bessel kernels and the hierarchies of the palindromic unimodal polynomials. We study the properties of such polynomials and conjecture positivity of their roots.

The results are based on a recent joint paper (arXiv-2405.03015) with I. Gaiur (Toronto) and D. van Straten (Mainz).

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