E-functions and geometry

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Abstract

Among the contributions of Yves André that have been a great source of inspiration for me over the years are his book "G-functions and geometry", where he proves for example that solutions of differential equations of geometric origin over the field of algebraic numbers are G-functions, and his two papers "Séries Gevrey de type arithmétique", where he determines the structure of the differential equations satisfied by E-functions and deduces a new proof of the Siegel-Shidlovsky theorem. I will survey on past and ongoing work with Peter Jossen in which we build on these fantastic results to study E-functions from the point of view of exponential motives. As a byproduct, we were for example able to answer in the negative Siegel's question whether all E-functions are polynomial expressions in hypergometric functions.

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