Siegel's problem for E-functions

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Résumé

Siegel defined and studied in 1929 the class of E-functions. They are power series with algebraic Taylor coefficients that satisfy certain archimedean and non-archimedean growth conditions, and solutions of linear differential equations with polynomial coefficients. They generalize the exponential function and, more generally, confluent hypergeometric series with rational parameters are E-functions. Siegel asked if hypergeometric functions enable to construct all E-functions (in a precise sense). After recalling several classical number theoretical results on E-functions, I will survey recent results on Siegel's question, that is now known to have a negative answer thanks to Fresan and Jossen. I will then focus on a "conditional" negative answer we had obtained earlier with Stéphane Fischler (Université Paris Saclay).

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