A non-hypergeometric E-function

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(joint work with Peter Jossen) In a landmark 1929 paper, Siegel introduced the class of E-functions with the goal of generalising the transcendence theorems for the values of the exponential. E-functions are power series with algebraic coefficients subject to certain growth conditions of arithmetic nature that satisfy a linear differential equation. Besides the exponential, examples include Bessel functions and a rich family of hypergeometric series. Siegel asked whether all E-functions are polynomial expressions in these hypergeometric series. I will explain why the answer is negative and a possible amendment to Siegel's question in the form "all E-functions come from exponential motives".