Series Representations and Generating Functions of Special Functions with Mathematica

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Abstract

In this talk the Mathematica package *SpecialFunctions* is introduced [6], [9]. Algorithms to convert between power series representations and their generating functions is the main topic of this package [1] – [9], including the work with orthogonal polynomials and special functions. The package automatically finds differential and recurrence equations [7], [8], and calculates power series representations and generating functions. As an application the fast calculation of polynomial approximations of solutions of linear differential equations with polynomial coefficients is presented.

References

[1] Gruntz, D. and Koepf, W.: Maple package on formal power series. Maple Technical Newsletter **2** (2), 1995, 22–28.

[2] Koepf, W.: Power series in Computer Algebra. Journal of Symbolic Computation **13**, 1992, 581–603.

[3] Koepf, W.: Algorithmic development of power series. In: Artificial intelligence and symbolic mathematical computing, ed. by J. Calmet and