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95f:68115[Koepf, Wolfram](#) (D-FUB)**Algorithmic development of power series. (English summary)***Artificial intelligence and symbolic mathematical computing* (Karlsruhe, 1992), 195–213,
Lecture Notes in Comput. Sci., 737, Springer, Berlin, 1993.[68Q40](#)

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Summary: “There is a one-to-one correspondence between formal power series (FPS) $\sum_{k=0}^{\infty} a_k x^k$ with positive radii of convergence and corresponding analytic functions. Since a goal of computer algebra is to work with formal objects and preserve such symbolic information, it should be possible to automate conversion between these forms in computer algebra systems. However, only MACSYMA provides a rather limited procedure ‘powerseries’ to calculate FPS from analytic expressions in certain special cases. We give an algorithmic approach to compute an FPS, which has been implemented by the author and A. Rennoch in MATHEMATICA, and by D. Gruntz in MAPLE. Moreover, the same algorithm can be reversed to calculate a function that corresponds to a given FPS in those cases when an initial value problem for a certain ordinary differential equation can be solved. Further topics of application, such as infinite summation and asymptotic expansion, are presented.”

{For the entire collection see [95b:68006](#)}

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