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**Koepf, Wolfram (D-UKSL)**

**Efficient computation on truncated power series: direct approach versus Newton's method.**  
(English summary)

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In this paper the author considers Newton's method and some of its higher-order generalizations in order to compute the Taylor coefficients of a function  $x(t)$  that is defined in an implicit way,  $f(t, x(t)) = 0$ . In particular, methods with quadratic, cubic and quartic order of convergence are considered. For such methods, the number of correct coefficients of the truncated power series of  $x(t)$  doubles, triples and quadruples, respectively.

Some particular cases, for instance, the generating function of the Catalan numbers, are considered. All the examples are developed in a very detailed way with both the Maple and the Mathematica computer algebra systems.

The author concludes that, in general, Newton's method is more efficient than the higher-order methods. In addition, in some cases, the implicit use of Newton's method is faster than the built-in direct computations.

Reviewed by *José M. Gutiérrez*

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