



Mathematical Physics

Efficient computation of the Zassenhaus formula

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A new recursive procedure to compute the Zassenhaus formula up to high order is presented, providing each exponent in the factorization directly as a linear combination of independent commutators and thus containing the minimum number of terms. The recursion can be easily implemented in a symbolic algebra package and requires much less computational effort, both in time and memory resources, than previous algorithms. In addition, by bounding appropriately each term in the recursion, it is possible to get a larger convergence domain of the Zassenhaus formula when it is formulated in a Banach algebra.

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