

Efficient algorithm for summation of some slowly convergent series

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Abstract

The \mathcal{Q} transformation, introduced recently by Woźny and Nowak, may serve as a good tool for summation of slowly convergence series. This approach can be easily applied to the case of generalized or basic hypergeometric series, as well as some orthogonal polynomial expansions. It is closely related to the famous Wynn's epsilon algorithm, Weniger's or Homeier's transformations, and the method introduced by Čížek, Zamastil and Skála.

However, it is difficult to use the algorithm proposed by Woźny and Nowak in the general case, because of its high complexity, and some other restrictions. We propose another realization of the \mathcal{Q} transformation, which results in obtaining a simpler and faster algorithm. Four illustrative numerical examples are given.

Key words: convergent acceleration; sequence transformations; orthogonal series.

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