

*In Memoriam Adelina Georgescu*

# APPROXIMATION FORMULAE GENERATED BY EXPONENTIAL FITTING\*

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## Abstract

We present the main elements of the exponential fitting technique for building up linear approximation formulae. We cover the two main components of this technique, that is the error analysis and the way in which the coefficients of the new formulae can be determined. We present briefly the recently developed error analysis of Coleman and Ixaru, whose main result is that the error of the formulae based on the exponential fitting (ef, for short) is a sum of *two* Lagrange-like terms, in contrast to the case of the classical formulae where it consists of a *single* term. For application we consider the case of two quadrature formulae (extended Newton-Cotes and Gauss), which are indistinguishable in the frame of the traditional error analysis, to find out that the Gauss rule is more accurate. As for the determination of the coefficients, we show how the *ef* procedure can be applied for deriving formulae of *classical* type. We re-obtain wellknown formulae and also derive some new ones.

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