

## Documents

Alkasassbeh, M., Omar, Z., Mebarek-Oudina, F., Raza, J., Chamkha, A.

**Heat transfer study of convective fin with temperature-dependent internal heat generation by hybrid block method**  
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### Abstract

Purpose: In this study, an implicit one-step hybrid block method using two off-step points involving the presence of a third derivative for solving second-order boundary value problems are subjected to Dirichlet-mixed conditions. Methodology: To derive this method, the approximate power series solution is interpolated at  $\{x_n, x_{n+2/5}\}$  while its second and third derivatives are collocated at all points  $\{x_n, x_{n+2/5}, x_{n+3/5}, x_{n+1}\}$  on the integrated interval of approximation. Findings: The new derived method not only performs better compared with the existing methods when solving the same problems but also obtains better properties of the numerical method. Afterward, the proposed method is applied to solve the problem of a convective fin with temperature-dependent internal heat generation. The effects of various physical parameters on temperature distribution are also examined. © 2019 Wiley Periodicals, Inc.

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