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# Numerical solution for differential equations of Lane-Emden type by Adomian decomposition and integration methods

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## Abstract

The aim of this talk is to present a well-suited approximation of a internal structure of a self-gravitating polytrophic body model which consists of a type Lane-Emden equation [3], a second order nonlinear ODE. First, we will discuss an efficient algorithm called Adomian decomposition method [1] which server as an approximation in terms of generalized Taylor series for the Lane-Emden equation. Next, we follow the methodology given in [2] to guarantee the convergence to the solution. Finally, we carry out several numerical experiments whose results are in accordance with the theoretical analysis.

## References

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