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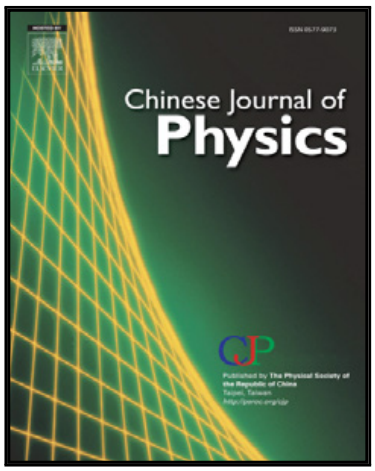

The extended Laplace transform method for mathematical analysis of the Thomas-Fermi equation

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Highlights

- An explicit semi-analytical solution for the Thomas-Fermi ODE is developed.
- The solution is more accurate than those of by the previous method.
- Diagonal Padé approximants are used as a post-treatment to improve the results.
- Explicit formulas for ground-state energy and electronic charge density are given.

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