

TITLE EVALUATION OF ELECTRON DISTRIBUTION FOR
MERCURY ATOM VIA THOMAS-FERMI EQUATION BY
MODIFIED ADOMIAN DECOMPOSITION METHOD:
ORDER-BY-ORDER EXTRACTION TECHNIQUE

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ABSTRACT

Thomas-Fermi model describe electron distribution for heavy atoms at ground state (in this work we use mercury atom; $Z=80$). In this thesis we propose algorithms for solving dimensionless Thomas-Fermi equation; $y''(x) = \frac{y^{3/2}(x)}{x^{1/2}}$, namely "Modified Adomian Decomposition Method (MADM), incorporating Padé approximants". We devise and employ Order-By-Order Extraction Technique (OBOET) for calculating Adomian polynomials; A_n , for several types of nonlinear ordinary differential equations, especially Thomas-Fermi equation.