



# Three-Dimensional Laplace Transform Coupled with the Three-Dimensional Marichev Saigo Maeda Integral Operator and Generalized Incomplete Hypergeometric Function

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## Abstract

In this paper, a three-dimensional (3D) Laplace transform is studied in conjunction with the Marichev-Saigo-Maeda (MSM) fractional integral operators and the generalized incomplete hypergeometric function. The proposed framework extends existing results by incorporating both left- and right-sided Saigo–Maeda operators, providing a unified approach for analyzing fractional integral transformations in higher dimensions. Several new results and formulations are derived, demonstrating the interaction between the 3D Laplace transform and MSM operators applied to incomplete hypergeometric functions. Furthermore, special cases and corollaries are presented to highlight the applicability and generalization of the obtained results. The proposed approach offers a new perspective in symmetry analysis and contributes to the advancement of fractional calculus with potential applications in mathematical physics and related fields.

**Keywords:** Integral transformation, Laplace transformation, operators, left & right sided SM operator, integrals, hypergeometric function.