

**FRACTIONAL CALCULUS OPERATORS ASSOCIATED WITH  
THE PRODUCT OF  $(p, q)$ -EXTENDED BESSEL FUNCTION AND  
GENERALIZED K-STRUVE FUNCTION**

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**(Received: Aug. 19, 2025 Accepted: Dec. 12, 2025 Published: Dec. 30, 2025)**

**Abstract:** Motivated by a recent work on Marichev-Saigo-Maeda fractional calculus operators associated with the generalized k-Struve function (Seema Kabra et al. [19] in Applied Mathematics and Nonlinear Sciences, 5(2), 593-602), this paper establishes four theorem by using Marichev -Maeda-Saigo fractional integral and derivative operators involving the product of the  $(p, q)$ -Extended Bessel function and Generalized k-Struve function, supported by serveral auxillary lemmas. The results are expressed in terms of the  ${}_r+kF_{s+k}$  and generalized k-Wright function  ${}_r\psi_s^k$ . Some new and known results are also obtained in special cases of main results.

**Keywords and Phrases:** MSM Fractional Calculus Operator,  $(p, q)$ -Extended Bessel function and Generalized k-Struve function,  $(p, q)$ -Extended generalized hypergeometric function and Generalized k-Wright function.

**2020 Mathematics Subject Classification:** Primary 26A33, Secondary 33C45, 33E12, 44A20.

## 1. Introduction

Fractional calculus is a branch of mathematics deals with various differential and integral operators. Fractional calculus operators are studied extensively due to their importance in applied problems of science and engineering. For our present