

## Composition Formulae Associated Fractional Integral Operator with the Multi-Index Mittag-Leffler Functions

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**Abstract.** In this paper, we aim at establishing new composition formulae for the Marichev-Saigo-Maeda (M-S-M) fractional integral operator and the multi-index Mittag-Leffler functions. Here, we record four such new and interesting special cases of our main results. The main results of this paper generalizes the results obtained by Choi and Agarwal [2]. Further, we obtain Laplace transforms of these composition formulae.

**Keywords.** Marichev Saigo Maeda Fractional Integral Operators, generalized multi-index Mittag-Leffler function, generalized Wright function

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### References

- [1] Agarwal, P. and Choi, J., *Fractional Calculus Operators and Their Images Formulas*, J. Korean Math. Soc., 53(5), 1183-1210, 2016.
- [2] Choi, J. and Agarwal, P., *A note on Fractional Integral Operator Associated with Multiindex Mittag-Leffler Functions*, Filomat, 30:7, 1931-1939, 2016.
- [3] Debnath, L. and Bhatta, D., *Integral Transforms and Their Applications*, Chapman & Hall/CRC, Boca Raton, London, New York, 2007.
- [4] Haubold, H. J., Mathai, A. M. and . Saxena, R. K, *Mittag-Leffler functions and their applications*, J. Appl. Math., 2011.
- [5] Kiryakova, V., *Multiple (multiindex) Mittag-Leffler functions and relations to generalized fractional calculus*, J. Comput. Appl. Math., 118, 241-259, 2000.

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