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A NEW MULTI DIMENSIONAL INTEGRAL TRANSFORM

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ABSTRACT : In the present paper, we introduce multidimensional integral transform to present its certain interesting applications to the theory of generalized multiple hypergeometric functions of several variables including multivariable H-function of Srivastava and Panda [17, 18]. We also discuss their special cases. The various operational formulas thus obtained are believed to be new. These results may be used in deriving new and known properties of special functions involved.

Key words and phrases : Multidimensional Integral Transforms, Multidimensional Laplacian Operator, Multidimensional Whittaker Transforms, Lauricella's Multiple Hypergeometric Functions, Multiple Hypergeometric Functions of Srivastava and Daoust, Multivariable H-Function of Srivastava and Panda.
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1. INTRODUCTION

Chandel [1] introduced multidimensional Laplacian operator to give integral representations of Lauricella's multiple hypergeometric functions of several variables [15]. Chandel [2] further used this operator to give integral representations of multiple hypergeometric functions ${}^{(k)}_{(1)}E_D^{(n)}$ and ${}^{(k)}_{(2)}E_D^{(n)}$ of Exton [12, 13]. Further Chandel and Dwivedi [4, 5] introduced multidimensional Whittaker transforms of Lauricella's multiple hypergeometric functions [15], Exton [12, 13] and generalized multiple hypergeometric function of Srivastava and Daoust [16] (also see Srivastava and Manocha [20, p. 64 (18), (19), (20)]). Recently Chandel and Kumar [6] have made applications of above multidimensional integral transforms to derive the results involving Srivastava and Panda's H-function of several complex variables [17, 18].

Very recently, Chandel and Chauhan [3] have introduced two multidimensional Laguerre transforms to present its certain applications to the theory of generalized multiple hypergeometric functions of several variables including multivariable H-function of Srivastava and Panda [17, 18].

In the present paper, making an appeal to the result due to Erdélyi et. al. [11, p. 311, eq. (28)]

$$\int_0^\infty t^{s/2-1}(1+t)^{-1/2}\left[t^{1/2}+(1+t)^{1/2}\right]^{\nu}dt = \frac{2^{1-s}\Gamma(s)\Gamma\left(\frac{1-s-\nu}{2}\right)}{\Gamma\left(\frac{1+s-\nu}{2}\right)}$$

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