

INTEGRAL TRANSFORMS OF FOURIER COSINE, FOURIER SINE AND LAPLACE GENERALIZED CONVOLUTION TYPE

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ABSTRACT. In any convolution of two functions f and g , if we fix one function, say g , as the kernel, and allow the other function f vary in a certain function space, we will get an integral transform. In this paper, we introduce a class of integral transforms related to two generalized convolutions for the Fourier cosine, Fourier sine and Laplace transforms. Necessary and sufficient conditions to ensure that the transformation is unitary on $L_2(\mathbb{R}_+)$ are obtained, and a formula for the inverse transformation is derived in this case. The Plancherel type theorem for these transforms is also obtained. As applications we apply these convolutions to solve a class integro-differential. equations.

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