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Transform of Some Operator Related to the Bessel Diamond Operator.

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ABSTRACT

In this research, we consider the solution of the equations $\oplus_B^k u(x) = \delta$, $\oplus_B^k(P \pm i0) = \delta$, and $\oplus_{B,8}^k Y(t) = \delta$ where \oplus_B^k and $\oplus_{B,8}^k$ are the operator related to the Bessel diamond operator iterated k -time and are defined by

$$\oplus_B^k = \left[\left(\sum_{i=1}^p B_{x_i} \right)^4 - \left(\sum_{j=p+1}^{p+q} B_{x_j} \right)^4 \right]^k$$

and

$$\oplus_{B,8}^k = \left[\left(\sum_{i=1}^p B_{x_i} \right)^8 - \left(\sum_{j=p+1}^{p+q} B_{x_j} \right)^8 \right]^k$$

where $p + q = n$, $B_{x_i} = \frac{\partial^2}{\partial x_i^2} + \frac{2v_i}{x_i} \frac{\partial}{\partial x_i}$, $v_i = 2\alpha_i + 1$, $\alpha_i > -\frac{1}{2}$ [4], $x_i > 0$, $i = 1, 2, \dots, n$, $P = P(x) = x_1^2 + x_2^2 + \dots + x_p^2 - x_{p+1}^2 - x_{p+2}^2 - \dots - x_{p+q}^2$, k is a nonnegative integer and n is the dimension of \mathbb{R}_n^+ . In this work we study the elementary solution of the operator $\oplus_B^k, \oplus_{B,8}^k$ and causal and anticausal solution of the operator \oplus_B^k .