ROCKY MOUNTAIN
JOURNAL OF MATHEMATICS
Volume 40, Number 1, 2010

FINITE SYMMETRIC TRILINEAR INTEGRAL TRANSFORM OF DISTRIBUTIONS. PART III

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ABSTRACT. In this paper we extend the finite symmetric trilinear integral transform to distributions and establish an inversion formula using Parseval's identity. The operational calculus generated is applied to find the temperature inside hexagonal prism of semi-infinite length.

1. Introduction. Sen [**5**] with the help of trilinear coordinates has solved different types of boundary value problems relating to boundaries in the form of an equilateral triangle. Any plane in the space is described by the set

$$E = \{x = (x_1, x_2, x_3)/x_1 + x_2 + x_3 = p,\ x_i \in R,\ i = 1, 2, 3\}$$

where x_1, x_2 and x_3 are the trilinear coordinates of a point and p is height of an equilateral triangle. If $a = (k/q)p$, where k, q are integers and $k \le q$, then the subset of E,

$$Hq = \{x \in E/0 < x_i < a,\ i = 1, 2, 3\}$$

describes a hexagonal region (Figure 1) if $a < p$ and an equilateral triangular region (Figure 2) if $k = q = 1$.

Sen [**5**] has also expressed two-dimensional Laplace operators in trilinear coordinates as

$$\begin{aligned} \nabla_1^2 &\equiv \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \\ &\equiv \frac{\partial^2}{\partial x_1^2} + \frac{\partial^2}{\partial x_2^2} + \frac{\partial^2}{\partial x_3^2} - \frac{\partial^2}{\partial x_1 \partial x_2} - \frac{\partial^2}{\partial x_2 \partial x_3} - \frac{\partial^2}{\partial x_1 \partial x_3} \qquad (1.1) \\ &\equiv -\frac{\partial}{\partial x_1}\frac{\partial}{\partial \eta_1} - \frac{\partial}{\partial x_2}\frac{\partial}{\partial \eta_2} - \frac{\partial}{\partial x_3}\frac{\partial}{\partial \eta_3} \\ &\equiv L \text{ (say)} \end{aligned}$$

2010 AMS *Mathematics subject classification.* Primary 46F12, 46F05.
Keywords and phrases. Symmetric trilinear integral transform, distribution.
The author is thankful to UGC, Western Regional office, Pune (India) for the award of minor research project UGC F.No. 47-210/05 dated 23 February, 2006.
Received by the editors on December 8, 2006, and in revised form on July 20, 2007.
DOI:10.1216/RMJ-2010-40-1-339