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*A Parseval equation and a generalized finite Hankel transformation*

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**Abstract:** In this paper, we study the finite Hankel transformation on spaces of generalized functions by developing a new procedure. We consider two Hankel type integral transformations  $h_\mu$  and  $h_\mu^*$  connected by the Parseval equation

$$\sum_{n=0}^{\infty} (h_\mu f)(n) (h_\mu^* \varphi)(n) = \int_0^1 f(x) \varphi(x) dx.$$

A space  $S_\mu$  of functions and a space  $L_\mu$  of complex sequences are introduced.  $h_\mu^*$  is an isomorphism from  $S_\mu$  onto  $L_\mu$  when  $\mu \geq -\frac{1}{2}$ . We propose to define the generalized finite Hankel transform  $h'_\mu f$  of  $f \in S'_\mu$  by

$$\langle (h'_\mu f), ((h_\mu^* \varphi)(n))_{n=0}^{\infty} \rangle = \langle f, \varphi \rangle, \quad \text{for } \varphi \in S_\mu.$$

**Keywords:** finite Hankel transformation, distribution, Parseval equation

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