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CONVERGENCE AND INVERSION RESULTS FOR A CLASS OF CONVOLUTION TRANSFORMS

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1. Introduction. In former papers [1] and [2] we introduced a generalization of a class of transforms treated mainly by Y. Tanno [4], [5] and [6]. The transforms are related to the meromorphic functions

$$F(s) = \left\{ \prod_{k=1}^{\infty} (1-s/a_k) e^{s/a_k} \Big/ \prod_{k=1}^{\infty} (1-s/c_k)\, e^{s/c_k} \right\} \tag{1.1}$$

where a_k and c_k are real and $0 \leqq a_k/c_k < 1$ and $\Sigma a_k^{-2} < \infty$.

Our investigation of $F(s)$ and $H(t)$ where $H(t)$ is defined by

$$[F(iy)]^{-1} = \int_{-\infty}^{\infty} e^{-iyt}\, dH(t) \tag{1.2}$$

was facilitated by the use of the number $N \equiv N_+ + N_-$ (see [1]).

In this paper we shall investigate the convergence of the transform

$$f(x) = \int_{-\infty}^{\infty} G(x-t)\, d\alpha(t) \tag{1.3}$$

where $\alpha(t) \in B.V.(A, B)$ for all A, B satisfying $-\infty < A < B < \infty$, and $G(t) = H'(t)$, or

$$f(x) = \int_{-\infty}^{\infty} G(x-t)\, \varphi(t)\, dt\,, \tag{1.4}$$

where $\varphi(t)$ is locally Lebesgue integrable. We shall use the notations we used in [1] and [2] without introducing them again.

We shall prove

$$\lim_{m\to\infty} R_m(D) f(x) = \varphi(x) \tag{1.5}$$