South East Asian J. of Mathematics and Mathematical Sciences
Vol. 19, No. 2 (2023), pp. 321-330

DOI: 10.56827/SEAJMMS.2023.1902.24 **ISSN (Online): 2582-0850**

ISSN (Print): 0972-7752

LINEAR CANONICAL TRANSFORM AND SCHWARTZ TYPE SPACES

B. B. Waphare and R. Z. Shaikh

MAEER's MIT Arts, Commerce & Science College,
Alandi - 412105, Pune, Maharashtra, INDIA

E-mail : balasahebwaphare@gmail.com, shaikhrahilanaz@gmail.com

(**Received:** *Jan. 04, 2023* **Accepted:** *Aug. 27, 2023* **Published:** *Aug. 30, 2023)*

Abstract: In this paper we have defined the Schwartz type spaces $S_{\Delta,\alpha,A}$, $S^{\Delta,\beta,B}$, $S^{\Delta,\beta,B}_{\Delta,\alpha,A}$. We have studied the mapping properties of LCT between these spaces.

Keywords and Phrases: Schwartz type spaces, Linear canonical transform, Convolution.

2020 Mathematics Subject Classification: 44A35.

1. Introduction

The theory of Fourier transform has wide history and application in Engineering, Technology, Physics, Mathematics, etc. In recent past, linear canonical transformation was being studied by many mathematicians. Motivated by Pankaj Jain et al. [4], we define linear canonical transform, $\Delta_{x,a}$, $\Delta^*_{x,a}$ and obtain new results. The Fourier transform and the related convolution respectively defined by

$$\hat{f}(\lambda) = \mathcal{F}[f;\lambda] = \int_{\mathbb{R}} f(x)\, e^{-i\,x\,\lambda}\, dx \tag{1.1}$$

and

$$(f * g)(\lambda) = \int_{\mathbb{R}} f(\lambda - x)\, g(x)\, dx$$

are important tool for solving many practical problems. To give rise more general transforms and convolutions such as fractional Fourier transform [3], [5], [6], [12],