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Ahmed I Zayed* (azayed@depaul.edu), Department of Mathematical Sciences, DePaul University, Chicago, IL 60614. *On the Reconstruction of a Class of Signals Bandlimited to a Disc in the Linear Canonical Transform Domain.*

The linear canonical transform is a generalization of the fractional Fourier transform which in turn is a generalization of the Fourier transform. It arose in optics and some signal processing applications because it can model many general optical systems. It has been used to solve problems in physics and quantum mechanics and it is associated with the homogeneous special group $SL(2, \mathbb{R})$, which is represented by the unimodular matrix

$$M = \begin{pmatrix} a & b \\ c & d \end{pmatrix}; \quad ad - bc = 1.$$

The reconstruction of a bandlimited signal in the linear canonical transform domain from its samples at a discrete set of points has been developed in one and several variables, but in the latter case it has primarily been obtained for signals that are bandlimited to a parallelepiped.

In this talk we present a reconstruction formula for signals that are bandlimited to a disc in the linear canonical transform domain. This formula includes, as special cases, sampling theorems for signals that are bandlimited to a disc in the fractional Fourier transform and the Fourier transform domains. (Received September 12, 2019)