



The algebra of 2D Gabor quaternionic offset linear canonical transform and uncertainty principles

The algebra of 2D Gabor quaternionic offset LCT and uncertainty principles

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Abstract

The Gabor quaternionic offset linear canonical transform (GQOLCT) is defined as a generalization of the quaternionic offset linear canonical transform (QOLCT). In this paper, we investigate the 2D GQOLCT. A new definition of the GQOLCT is provided along with its several important properties, such as boundedness, orthogonality relation, Plancherel and inversion formulas, are derived based on the spectral representation of the GQOLCT. Further, we establish a version of Lieb's and logarithmic inequalities. Finally we will prove a type of the Heisenberg inequality by using local uncertainty principle.

Keywords Quaternion algebra · Gabor transform · Quaternion offset linear canonical transform · Gabor quaternion offset linear canonical transform · Lieb's inequality · Uncertainty principles

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