Some Useful Properties of Ambiguity Function Associated with Linear Canonical Transform

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Abstract

The ambiguity function associated with the linear canonical transform (LCT) is a generalization of the one-dimensional ambiguity function using the linear canonical transform, called the linear canonical ambiguity function (LCAF). We first investigate its basic properties such as the complex conjugation, translation and modulation. These properties are extensions of the corresponding versions of the classical ambiguity function. Using the basic relationship between the LCT and LCAF, we derive the inversion and Moyal formulas for the LCAF. Based on a convolution theorem for the LCT, we propose the convolution theorem related to LCAF. Finally, through simulation example, we demonstrate how the proposed convolution generalizes the formulation of the classical ambiguity function convolution.

Keywords: linear canonical transform, ambiguity function, linear canonical ambiguity function.

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