Some Essential Relations for the Quaternion Quadratic-Phase Fourier Transform

ABSTRACT

Motivated by the fact that the quaternion Fourier transform is a powerful tool in quaternion signal analysis, here, we study the quaternion quadratic-phase Fourier transform, which is a generalized version of the quaternion Fourier transform. We first give a definition of the quaternion quadratic-phase Fourier transform. We derive in detail some essential properties related to this generalized transformation. We explore how the quaternion quadratic-phase Fourier transform is related to the quaternion Fourier transform. It is shown that this relation allows us to obtain several versions of uncertainty principles concerning the quaternion quadratic-phase Fourier transform.