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**Clifford-Valued Stockwell Transform and the Associated Windowed Uncertainty Principles**

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Abstract

In the framework of higher-dimensional time-frequency analysis, we propose a novel Clifford-valued Stockwell transform for an efffective and directional representation of Clifford-valued functions. The proposed transform rectifies the windowed Fourier and wavelet transformations by employing an angular, scalable and localized window, which offers directional flexibility in the multi-scale signal analysis in Clifford domains. The basic properties of the proposed transform such as inner product relation, reconstruction formula, and the range theorem are investigated using the machinery of operator theory and Clifford Fourier transforms. Moreover, several extensions of the well-known Heisenbergtype inequalities are derived for the proposed transform in the Clifford Fourier domain. We culminate our investigation by deriving the directional uncertainty principles for the Clifford-valued Stockwell transform. To validate the acquired results, illustrative examples are given

**Keywords:** Clifford-valued Stockwell transform, Clifford-valued Fourier transform, Uncertainty principle.