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Probabilistic Entropy and Other Uncertainty Principles for the Multi-dimensional Special Affine Fourier Transform

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Abstract

The multi-dimensional Special Affine Fourier transform (MSAFT) is an intriguing new addition to the integral transform class, which generalizes several popular unitary transformations, signal processing transformations, and mathematical procedures linked to optics. Such as the multi-dimensional linear canonical transform, the multi-dimensional fractional Fourier transform, and so on. In this paper, we extend several quantum mechanical uncertainty principles (UPs), such as Classical Heisenberg's UP, Nazarov's UP, Hardy's UP, Beurling's UP, Logarithmic UP, and Entropic UP, which have already been thoroughly studied in the Fourier transform domain over the last few decades, to the MSAFT domain in a broader sense in order to characterize simul-

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