

Time series signal synthesis from Wigner distribution using wavelets

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Wigner distribution is one of the methods to detect the time varying frequency characteristics of the signal. It has high resolution and satisfies the marginal condition. It is very difficult to construct the Wigner distribution that can be inverted to the time series.

We propose a method for the synthesis of time series signal. Wigner distributions of orthogonal wavelets are normal to each other, and they can span the space which includes all representable Wigner distributions. We can synthesize the time series signal whose Wigner distribution approximates the original Wigner distribution. We also apply the proposed method to the strong motion record and show its efficiency.