

## **Sensing and Sparsity Based Method for Time-Frequency Distribution Optimization**

Nonstationary signals are optimally represented in the joint time-frequency domain using time-frequency distributions (TFDs). The unwanted artefacts, which are by-products of TFDs quadratic nature, make TFD interpretation a challenging task. Recently proposed methods address the problem of artefact removal by employing compressive sensing (CS) techniques, with the unavoidable resolution loss being reduced by using reconstruction algorithms based on sparsity constraints. In this work, we study the effects of the CS area size and shape selection on the resulting sparse TFD performance. We also propose a method for automatic data-driven CS area selection. The method performance is tested on synthetic signals, and examples of geophysical signals and their models.

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