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IMPROVING TIME-FREQUENCY DOMAIN SLEEP EEG CLASSIFICATION VIA SINGULAR SPECTRUM ANALYSIS

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Highlights

- We improve the Time-Frequency (T-F) domain analysis of sleep electroencephalography (EEG) by applying a novel preprocessing stage to our dataset.
- The proposed approach is based on Singular Spectrum Analysis (SSA) which separates the desired components (brain waves, sleep spindles, and K-complexes) from sleep EEG signal.
- The single-channel EEG signal is initially decomposed and after applying a constrained SSA, the wanted components are reconstructed.
- The optimised T-F features are utilised as an input for support vector machine (SVM) classifier to classify four sleep stages.
- We achieve enhanced performance on T-F domain and increased classification accuracy which have application into sleep disorders characterisation.

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