

## Dual-Channel Multi-Band Spectral Subtraction Algorithm Dedicated to a Bilateral Cochlear Implant

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**Abstract :** In this paper, a Speech Enhancement Algorithm based on Multi-Band Spectral Subtraction (MBSS) principle is evaluated for Bilateral Cochlear Implant (BCI) users. Specifically, dual-channel noise power spectral estimation algorithm using Power Spectral Densities (PSD) and Cross Power Spectral Densities (CPSD) of the observed signals is studied. The enhanced speech signal is obtained using Dual-Channel Multi-Band Spectral Subtraction 'DC-MBSS' algorithm. For performance evaluation, objective speech assessment test relying on Perceptual Evaluation of Speech Quality (PESQ) score is performed to fix the optimal number of frequency bands needed in DC-MBSS algorithm. In order to evaluate the speech intelligibility, subjective listening tests are assessed with 3 deafened BCI patients. Experimental results obtained using French Lafon database corrupted by an additive babble noise at different Signal-to-Noise Ratios (SNR) showed that DC-MBSS algorithm improves speech understanding for single and multiple interfering noise sources.

**Keywords :** speech enhancement, spectral subtraction, noise estimation, cochlear implant

**Conference Title :** ICECECE 2015 : International Conference on Electrical, Computer, Electronics and Communication Engineering

**Conference Location :** Jeddah, Saudi Arabia

**Conference Dates :** January 26-27, 2015