



ID: P3.5-680

Type: e-Poster

new method of denoising seismic signals using blind source separation

Thursday 1 July 2021 10:30 (15 minutes)

Seismic signal processing aimed at extracting relevant information is often faced with the problem of the presence of disturbing signals, which can be generated by different sources of noise. This problem is all the more glaring when the seismic event of interest is so weak that it is drowned in noise, and can therefore pass without being noticed. We propose in this paper a new method which allows to solve this problem by using a Blind Source Separation (BSS) approach. Based on Independent Component Analysis (ICA), our method makes it possible to estimate the contributions of each of the noise sources, then to subtract them from the seismic signal supplied by each sensor. For this, we model each seismic signal as a linear mixture of all the sources present, and we assume that the number of sensors is greater than the total number of these sources. In our processing, we focus on the slices of the observed signals where only the noise sources are present, assuming that the latter are stationary and independent.

Our new denoising method has been statistically validated on mixtures of artificial sources. The results of tests carried out on some real seismic signals are very encouraging.

Promotional text

In this paper, we propose a new solution to the familiar problem of noise that can interfere with the extraction of relevant information from a seismic signal. This solution which uses a Blind Source Separation approach is based on Independent Component Analysis.

Primary author: SAYLANI, Hicham (Faculté des Sciences d'Agadir, Morocco)

Presenter: SAYLANI, Hicham (Faculté des Sciences d'Agadir, Morocco)

Session Classification: T3.5 e-poster session

Track Classification: Theme 3. Verification Technologies and Technique Application: T3.5 - Data Analysis Algorithms