
Using melomind for cognitive research studies: The epitome of ergonomic and affordable EEG technology

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Résumé

A number of low-cost, mobile electroencephalographic (EEG) devices have become available in the market recently. Melomind is a new ergonomic neurofeedback system with two dry sensors at the parietal region integrated to a pair of headphones.

This work evaluates the suitability of this device to perform general purpose research studies. We recorded 4-minutes of resting state (eyes open and eyes closed), 2 minutes of Steady-State Visual Evoked Potential (SSVEP) at 15 Hz and 10-minutes of the visual oddball paradigm. For comparison purposes, during the experiments the EEG of the subjects was simultaneously recorded using a Brain Vision ActiCHamp system, equipped only with two electrodes, at P3 and P4 positions. External triggers were inserted in both systems to synchronize the recordings.

The analysis of the results led to a number of conclusions: i) the correlation of the signals in time domain of both devices is higher than 0.8, ii) the peaks in alpha frequency band are clearly visible and the SNR values identical, iii) the SSVEP at 15Hz in melomind only presents an SNR reduction of 15% with respect to Brain Vision and iv) for the oddball paradigm, we do not find significant differences concerning latencies and amplitudes for P300 waves. As the qualities of the signals quantified using the same metric are highly comparable, melomind provides an affordable solution to perform scientific research involving the somatosensory or the visual cortex.

Mots-Clés: portable EEG, Neurofeedback, Melomind

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