In this study we assessed the performance of MLR and MLR of ERPs in single trials are summarized in Fig. 2. Also, the distortion ratio dispersion term (MLR on multiple linear regression (MLR) and multiple linear regression with dispersion term (MLR)).

In order to address the problem in across-trial averaging approach, to obtain a reliable single-trial estimate of LEP latency and morphology of single-trial ERP waveforms. This generates a set of regressors used to fit the single-trial ERPs. The methods based on multiple linear regression (MLR) and multiple linear regression with dispersion term (MLR) are used to identify the principal components that capture the variance of both single-trial LEP waveforms. In this study we assessed the performance of MLR and MLR, with and without time-frequency wavelet filtering (WF).

RESULTS AND SIGNIFICANCE
(1) WF significantly enhances the SNR of ERPs in single trials.
(2) The MLRs effectively captures the variability in the morphology of single-trial LEPs, thus provides an accurate and reliable estimation of the latency and the N2 and P2 single-trial amplitudes, as well as between the intensity of pain perception and the N2 single-trial latencies.
(3) There was a strong correlation between single-trial N2 and P2 latencies, and between single-trial N2 and P2 amplitudes.

This approach may provide new insights into the functional significance of the different brain processes underlying the brain responses to sensory stimuli.

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