

Figure 2. a) Group Averaged (16 normal subjects) Pz ERP to rare targets in a visual P300 experiment (see [12] for recording details); b) Fitted P300-ERP Wavelet; c) MRRs using matched P300-ERP, Haar, and Daubechies D4 wavelets.

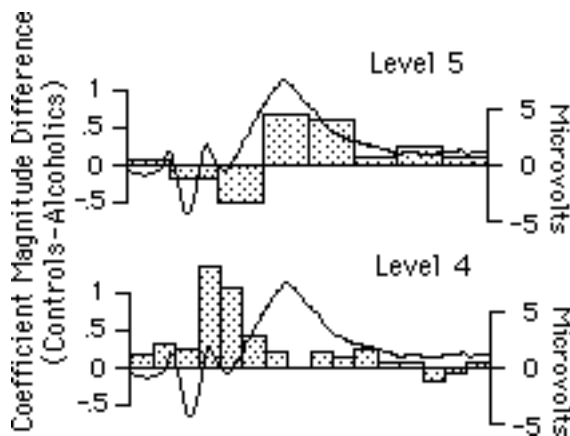


Figure 3. Group coefficient magnitude difference plots for detail functions 4 (8-16 Hz alpha) and 5 (4-8 Hz theta). Grand average ERP superimposed for time localization.

around the latter half of the P1-N1-P2-N2 complex. Differences in the P1-N1-P2-N2 complex have not been identified previously by standard peak analysis. These effects at distinct waveform scales may index distinct neural mechanisms related to alcoholism.

3. CONCLUSION

We have illustrated the construction of matched Meyer wavelets for auditory and visual neural waveforms, and have demonstrated that MRAs using such wavelets achieve a physiologically natural decomposition of ERPs that can localize functionally meaningful clinical effects. Designer neural wavelets hold considerable potential for customizing neural signal and image processing for advanced clinical and experimental applications.

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