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EARLY VISUAL EVOKED RESPONSE PEAKS APPEAR TO BE SUMS OF ACTIVITY IN MULTIPLE ALPHA SOURCES. S. Makeig^{†*}, J. Townsend[§], T-P. Jung[§], S. Enghoff[†], C. Gibson[†], and T.J. Sejnowski^{†§}. [†]Salk Institute, La Jolla CA and Howard Hughes Medical Institute. [†]Naval Health Research Center, San Diego CA. [§]University of California San Diego.

The normal early P1/N1 peaks in the human visual evoked response may be followed by a continuing series of peaks at approximately 100 ms intervals, often dubbed "alpha ringing." We applied independent component analysis (ICA) to over 1000 single trials (between 50 ms and 250 ms after stimulus onset) collected from 8 subjects during a visual selective attention experiment. Responses to stimuli (small disks flashed for 116 ms) presented to the left and right of fixation were decomposed separately. Most of the 31 resulting components could be paired with a component from the opposite-field decomposition with a similar scalp map, EEG spectrum, and grand average response. The N1 complex in the grand mean evoked response was decomposed into five or more independent components. The scalp maps of the most consistent of these across subjects resembled the early independent components of the grand average evoked response from 20 subjects (Makeig et al., in press). The EEG spectra of many of these components contained a peak in the alpha range and contributed to more than one peak in the evoked response. Applying ICA spatial filtering followed by time/frequency analysis demonstrated that changes in mean alpha amplitude did not occur after stimulus onset. These results suggest that the early (P1/N1) components of the human visual evoked response sum contributions from multiple spontaneous alpha sources whose activity is phase-reset by visual stimulation.

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