

Oscillatory activity, behaviour and memory, new approaches for LFP signal analysis  
Vialatte F (1), Martin C (2), Ravel N (2), Quenet B (1), Dreyfus G (1), Gervais R (2)

(1) Laboratoire d'Électronique, ESPCI, Paris, France;

(2) Neurobiologie de la Mémoire Olfactive, Institut des Sciences Cognitives, Lyon,  
France

Large neuron assemblies exhibit complex dynamic behaviours. Despite extensive investigations, the features of that behaviour that have a cognitive significance, the 'neuronal code', are still poorly understood. That question can be approached experimentally by recording simultaneously the electrical activity of populations of neurons: electroencephalographic recordings and, more recently and with a much better spatial resolution, local field potential recordings. The present work focuses on the neural dynamics supporting perception and memory. Recent data have shown that learning generates clear-cut modifications of the odour-induced activity. The analysis of electrophysiological recordings is based on continuous and orthogonal wavelet transforms, aiming first at locating the occurrence of typical frequencies in the signal (in the Alpha, Beta and Gamma frequency ranges), and at studying typical sequences of frequencies, which are supposed to arise from interactions between neuronal populations implied in the cognitive tasks. We will focus on learning-induced modifications in such sequences.