

As to the biological basis, it has remained unclear whether the basic and first “harmonic” frequencies of essential tremor are indeed simply coupled or distinct oscillations. The estimation of dynamics over time in coherent signals from brain and muscles explains two important aspects of these two oscillations. Firstly, at different time intervals both these frequencies are connected to the periphery. Secondly, the dynamics intuitively can indicate whether both these frequencies have a role to play in the tremor generation or voluntary movement in healthy subjects. In this study, the dynamical coherence was estimated using the multitaper method for EEG and EMG data from 5 essential tremor patients and 5 healthy subjects. The results indicate that both frequencies have different dynamics over time. However, the correlation between these two oscillations for essential tremor patients are negative which means that they have distinct dynamics over time, in contrast to the healthy subjects where the correlation was positive. Hence, it supports the hypothesis that they are distinct oscillations in the case of essential tremor patients and simple harmonics in the case of healthy subjects.