

Abstract Submitted  
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**Entropic Analysis of Electromyography Time Series** MIRON KAUFMAN, ULRICH ZURCHER, Physics Department, Cleveland State University, PAUL SUNG, Health Sciences Department, Cleveland State University — We are in the process of assessing the effectiveness of fractal and entropic measures for the diagnostic of low back pain from surface electromyography (EMG) time series. Surface electromyography (EMG) is used to assess patients with low back pain. In a typical EMG measurement, the voltage is measured every millisecond. We observed back muscle fatiguing during one minute, which results in a time series with 60,000 entries. We characterize the complexity of time series by computing the Shannon entropy time dependence. The analysis of the time series from different relevant muscles from healthy and low back pain (LBP) individuals provides evidence that the level of variability of back muscle activities is much larger for healthy individuals than for individuals with LBP. In general the time dependence of the entropy shows a crossover from a diffusive regime to a regime characterized by long time correlations (self organization) at about 0.01s.

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