Abstract

In this work, we study sequences of excursions from heart interbeat time series. An excursion is defined as the time employed by a walker to return to its mean value. Scaling properties of excursions during wake and sleep periods from two groups are compared: 16 healthy subjects and 11 patients with congestive heart failure (CHF). We find that the cumulative distributions of excursions for both groups follow stretched exponential functions given by \( g(x) = e^{-ax^b} \) with different fitting parameters \( a \) and \( b \). Next, we explore changes in the distributions of excursions when considering (i) a shifted mean value to define an excursion and (ii) the sum of the \( k \)-th excursion successor. Finally, the presence of correlations in the excursions sequences is evaluated by means of the detrended fluctuation analysis.

Keywords

Excursions, distributions, correlations.