



Multifractal spectra of laser Doppler flowmetry signals in healthy and sleep apnea syndrome subjects

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Résumé en anglais

Laser Doppler flowmetry (LDF) signals give a peripheral view of the cardiovascular system. To better understand the possible modifications brought by sleep apnea syndrome (SAS) in LDF signals, we herein propose to analyze the complexity of such signals in obstructive SAS subjects, and to compare the results with those obtained in healthy subjects. SAS is a pathology that leads to a drop in the parasympathetic tone associated with an increase in the sympathetic tone in awakens SAS patients. Nine men with obstructive SAS and nine healthy men participated awakens in our study and LDF signals were recorded in the forearm. In our work, complexity of LDF signals is analyzed through the computation and analysis of their multifractal spectra. The multifractal spectra are estimated by first estimating the discrete partition function of the signals, then by determining their Renyi exponents with a linear regression, and finally by computing their Legendre transform. The results show that, at rest, obstructive SAS has no or little impact on the multifractal spectra of LDF signals recorded in the forearm. This study shows that the physiological modifications brought by obstructive SAS do not modify the complexity of LDF signals when recorded in the forearm.

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