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Age-related alterations of relaxation processes and non-Markov effects in stochastic dynamics of R–R intervals variability from human ECGs

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Abstract

In this paper, we consider the age-related alterations of heart rate variability on the basis of the study of non-Markovian effects. The age dynamics of relaxation processes is quantitatively described by means of local relaxation parameters, calculated by the specific localization procedure. We offer a quantitative informational measure of non-Markovity to evaluate the change of statistical effects of memory. Local relaxation parameters for young and elderly people differ by 3.3 times, and quantitative measures of non-Markovity differ by 4.2 times. The comparison of quantitative parameters allows to draw conclusions about the reduction of relaxation rate with ageing and the higher degree of the Markovity of heart rate variability of elderly people.

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