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Résumé :
Regulation of heart rate variability (HRV) isdependent on the autonomicnervous system (ANS). The regulation is achieved by the two ANS activity branches distribution, namely the parasympathetic and the sympatheticactivities. Their fluctuations can be observed in the HRV signal spectral domain through respective dissociated frequency domains. Power spectrum parameters in low frequency (LF) and high frequency (HF) domains are classically estimated using predetermined fixed frequency ranges which are [0.04–0.15 Hz] band for LF domain and [0.15–0.4 Hz] band for HF domain. However, the 0.15 Hz frequency threshold is controversial in dynamic situations or positions changing. Several studies advanced that the observed cardiac and respiratory oscillation interactions could reflect the functionality of the ANS. These interactions can be estimated by the cardiorespiratory spectral coher-encetoolwhich quantifies the existence and strength of linearity between the two modes. We propose in this paper to jointly use the heart rate variability (HRV) and respiration modes by exploiting the car-diorespiratory spectral coherence tool for the time-varying frequency threshold definition between LF and HF bands. The instantaneous center frequency computed on the time-frequency coherence estimatoris the proposed variable threshold (VT). The VT method was implemented on both simulated data and real data acquired from the experimental orthostatic test protocol with 10 healthy subjects. The classical 0.15 Hz fixed threshold (FT) and the individual time-dependent spectral boundaries method (AT) using the lower limit of the respiratory HF band as a time-varying threshold are used for comparison. The proposed VT strategy makes it possible to obtain: (i) a strengthened data-dependent definition of boundaries for the HF domain; (ii) instantaneous estimations of the LF and HF band energies; (iii) a better discrimination between the two positions SUPINE and UPRIGHT of the classical orthostatic test.