



TRAINING-PERFORMANCE INTERACTION MODEL: BRILLIANCE AND POVERTY

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The optimal construction of the training process in order to achieve the highest sports result at the lowest physiological "price" is one of the most important problems of sports. The dynamics of the result is determined by the features of individual adaptive reactions of the athlete's body to physical activity, sensitivity to training stimuli, individual parameters of acute, urgent, cumulative, residual and delayed training effects. There are several approaches to mathematical modeling of adaptation of the organism to training stress. The approach using models of individual functional systems of the body faces great difficulties and this task has not yet been solved. Another approach is model of "black box", which has been used for a long time. Input of object is a time series of quantified "doses" of training, and the output – the performance. It makes sense to talk about the following tasks, one direct problem – prediction of results with known parameters, and two inverse problems – the identification of unknown parameters of the object and the synthesis of the training plan. The case is further complicated by the fact that the system has various uncertainties caused by uncontrolled disturbances acting on the object, insufficient knowledge about the object, changes in the properties of the object over time and inaccuracies in the measurement of the load and the performance, unknown to the prehistory of the object. Coping with difficulties and to describe the observed training effects are sometimes possible by applying various mathematical methods. The issues of physiological credibility of different models, validity of methods and confidence in the results will be discussed.