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Distribution of Sports Load by the Smart Photovoltaic Cell Switching System

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Abstract. In order to discuss the allocation effect of an intelligent photovoltaic cell switching system on sports load, this paper, based on the ZigBee sensing model, designs the information allocation module for collecting sports load status based on the spectral characteristic analysis of model parameters and the real-time observation of sports load status, and obtains the initial data. In-depth analysis of the correlation analysis of intelligent photovoltaic cell switching system on sports load allocation, and judge the influence degree of sports load allocation. The results show that in the monitoring of sports load status, the data acquisition frequency of 28 to 30 kHz can reach -50 dB, and the maximum oxygen uptake VO2, the number of max indicators reached 33.21 ± 3.09 and O2, the number of P indicators is 362.57 ± 98.71, and the number of METs is 9.06 ± 1.21. Therefore, we show that the smart photovoltaic cell switching system has a positive correlation with the sports load distribution, and the smart photovoltaic cell switching system has a practical effect on the sports load distribution.

Key words. Smart Photovoltaic Cells, Switching System, Sports Load, Distribution.

1. Introduction

Nowadays, the public is increasingly concerned about their own health status, so they frequently participate in sports in order to enhance their own physical quality. However, compared with professional sports athletes, non-professional sports athletes usually cannot accurately understand and control the focus and critical points of sports training. Therefore, the construction of the sports load monitoring system came into being. In order to explore the allocation of sports load by the intelligent photovoltaic cell switching system, this study especially explores an efficient sports load monitoring system, aiming to optimize the sports load state characteristic parameter identification system, and realize the monitoring and optimization management of the right and sports training state [1].

This study discusses the allocation of sports load by the smart photovoltaic cell switching system, the core of which relies on the collection and extraction of relevant sports load condition parameters [2]. The study, use the latest information processing methods and big data analysis technology to check the characteristics of the parameters, in order to increase its accuracy and stability, and based on the intelligent photovoltaic cell switching system, including the parameters of the information integration model, and the collection of sports load characteristic parameters, in order to achieve accurate monitoring of sports load status and information integration. For sports load pressure situations, the study through a variety of model methods to monitor recognition, using an intelligent photovoltaic cell switching system ZigBee sensing model to identify information, the use of IoT technology [3], and has various characteristics of data fusion method, and in a large number of sports load check, its ability to resist the outside influence is weak, at the same time the stability of the inspection results is relatively low [4].

Based on the above background, this paper proposes a sports load state monitoring model based on the characteristic parameters of the intelligent photovoltaic cell switching system for related problems. The first priority is to use the WSM node to collect sports load state parameters, and through the intelligent photovoltaic cell switching system [5], and the RF label identification technology application, real-time state of load characteristics of sports parameters spectrum characteristic analysis and real-time sports condition tracking monitoring, thus intelligent photovoltaic cell switching system for sports load allocation ability has a significant advantage.

2. Analysis of Related Problems

A. Data Information Processing Model of Sports Load Status

This study uses a smart photovoltaic cell switching system to deal with the collected sports load state parameters, and to realize the fusion and clustering of feature parameters. When the target function k of the spectral signal of the characteristic parameter is determined, this study obtains the detection output of the characteristic parameter, and constructs the sports load data information fusion processing model *y(n)*, as shown in formula (1):

$$\begin{cases} y(n) = Mid\{\overline{X}\} \\ \overline{X} = \sqrt{x(n-k)^2, \cdots, x(n)^2, \cdots, x(n+k)^2} \end{cases} \quad (1)$$

In formula (1), x represents the load state coefficient of sports, n represents the characteristic parameter, and k represents the spectral signal function of the characteristic parameter of the sports load state. When the variance is $y(n)=1$, this study set the critical feature point of the transition from aerobic metabolism to anaerobic metabolism as the threshold, so as to identify the sports load status information and form the model of sports load status information identification model *dn*, as shown in formula (2):

$$d_n = -2eX_v \quad (2)$$

In formula (2), e represents the initial state of sports load; X_v is load status information, v represents time point. In this study, we used the network protocol model of $E(V^2)$ and conducted the periodic inspection of sports load characteristic parameters, so as to obtain the corresponding periodic spectrum information Xv ,$\{v$=1, 2, n$\}$, when the lowest value is reached, the load fusion component model, $E(V^2)$ as shown in formula (3):

$$E(V^2) = [x(n) - s(n)]^2 - \sum_{v=1}^{V} b_v x_v \quad (3)$$

In formula (3), $x(n)$ represents the critical threshold of sports load, b_v represents the standard information obtained by the system, s(n) represents the characteristic quantity of the segmented tiled parameters, and designs the clustering model [10], *W(n + 1)* is the state of the sports load, as shown in formula (4):

$$W(n+1) = W(n) - b_v \nabla E[s^2(n)] \quad (4)$$

W(n), $\nabla E[s^2(n)]$ in formula (4), represents the initial adjustment function and the phased information fusion processing dynamics of sports load, and finally forms the data and information fusion model of sports load state monitoring, which scientifically realizes the state monitoring and fusion of sports load state disposal.

B. Monitoring Model of Sports Load Allocation Conducted by the Intelligent Photovoltaic Cell Switching System

This study uses ZigBee IoT networking and RFID RF tag identification means, combined with the application of an intelligent photovoltaic cell switching system, to build a monitoring and identification model for the characteristic parameters of sports load, and implement the self-regulation of the spectral characteristics of sports load. Therefore, by using RFID RF tag identification technology, the core characteristic information of the intelligent photovoltaic cell switching system on the sports load is accurately obtained. On this basis, this study is based on the intelligent photovoltaic cell switching system to build the characteristic value monitoring model $s(n)$ for the spectral balance output of the sports load distribution status, as shown in formula (5):

$$s(n) = \left(1 - \frac{\sigma^2}{k}\right) y(n) \quad (5)$$

In formula (5), σ^2 represents the variance, k represents the spectral signal function of the characteristic parameter of sports load state, and $y(n)$ represents the characteristic value monitoring data under the switching state of a smart photovoltaic cell. For the operation mode of middle- and long-distance running, this study can obtain the peak analysis reasult $u(n)$, as shown in formula (6):

$$u(n) = \frac{1}{x(n) + X_v W(n)} \quad (6)$$

Where $x(n)$ is the characteristic value monitoring data in the conventional state, X_v is the spectrum information which is applied to the intelligent photovoltaic cell switching system at the v-th node, and $W(n)$ is the initial adjustment function. According to the data of cardiopulmonary function detection, this study obtained the fusion characteristic distribution set of sports load status. Under the application state of intelligent photovoltaic cell switching system, this study establishes the estimation results of the characteristic parameter detection of sports load state, which is in the interval [m_0-Δm/2], m_0 is Statistical analysis result of the above characteristic parameters, Δm is chang data. The characteristic parameter model *Z(n)* is as shown in formula (7):

$$Z(n) = W(n) + \frac{1}{d_v \cdot x_n^2 \cdot x_v} s(n) \quad (7)$$

In formula (7), d_v represents the identification data of switching state in the smart photovoltaic cells at the v th node, x_n^2 represents the characteristic parameter index, x_v is the spectral information of the v-th node, and *s(n)* represents the characteristic value monitoring model of the spectral equilibrium output. By using the detection technology of spectral components, this study can obtain the characteristic parameters of the sports load distribution status of the intelligent photovoltaic cell switching system. Therefore, according to the above research, this research established a monitoring model of the intelligent photovoltaic cell switching system, and realized the monitoring of load state characteristics and identifying characteristic parameters according to the analysis results of the model.

C. Calculation Process of Sports Load Allocation by Intelligent Photovoltaic Cell Switching System

Since the smart photovoltaic cell switching system will have a significant impact on the sports load allocation, this study carried out an in-depth study based on the ZigBee sensing model, and calculated the relevant index parameters, so as to provide detailed information support for the subsequent research. The specific calculation process is as follows.

Step 1: Build the data information processing model of the sports load status, identify the sports load status information, and form the sports load status information identification system, further clarify the sports load allocation index, and form the calculation and analysis formula (1)–(2);

Step 2: Combined with the analysis of the ZigBee sensing model, calculate the correlation between the intelligent photovoltaic cell switching system and the sports load distribution by mathematical method, and form the calculation and analysis formula (3)–(4);

Step 3: Based on the information identification index, build the characteristic value monitoring model of spectrum balance output, and calculate the summarized sports load information, clarify the optimization impact of the development of an intelligent photovoltaic cell switching system on sports load allocation, and form the calculation and analysis formula (5)–(7).

Step 4: Based on the information and data analysis in the early stage, actively search and collect relevant data, build the monitoring model of sports load allocation by the intelligent photovoltaic cell switching system, and further define the maximum oxygen uptake VO2Max, heart rate HR and other indicators to form operable calculation results [6].

Step 5: Through the model calculation of each stage, according to the change of each index, gradually compare and analyze the influence effect of different degrees of sports load, and the final research results are obtained.

3. Results

A. Sensing Information Acquisition for Sports Exercise Load Status Monitoring

In view of the design of the sports activity load condition detection system based on characteristic parameters, this study designed the information module for collection and sports load status with the help of the ZigBee sensing model (Figure 1).

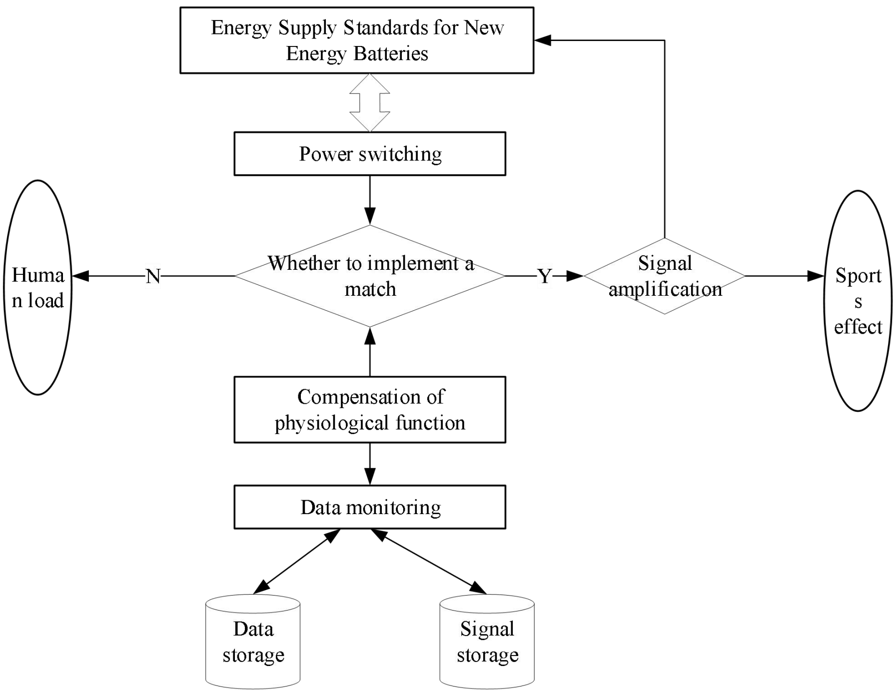

Fig. 1. Data Acquisition Module for Sports Exercise Load Status Monitoring

As shown in Figure 1, based on the data collection module of the sports load status of the intelligent photovoltaic cell switching system, the module uses the transmission control method of the local bus to integrate the information of the load status characteristic parameters of sports. This process is combined with the intelligent photovoltaic cell switching system, and the remote transmission control model is designed to timely feedback on the sports load status monitoring data. For example, the TMS320C50DSP intelligent photovoltaic cell switching system is selected as the key processor [6] of the sports load status characteristics monitoring system, so as to complete the comprehensive information processing of the sports load status characteristics. The buffer zone is designed to monitor the sports load status. Control command issuing and information management are executed through the sync / Trigger trigger mechanism, thus forming the overall architecture model design (Figure 2).

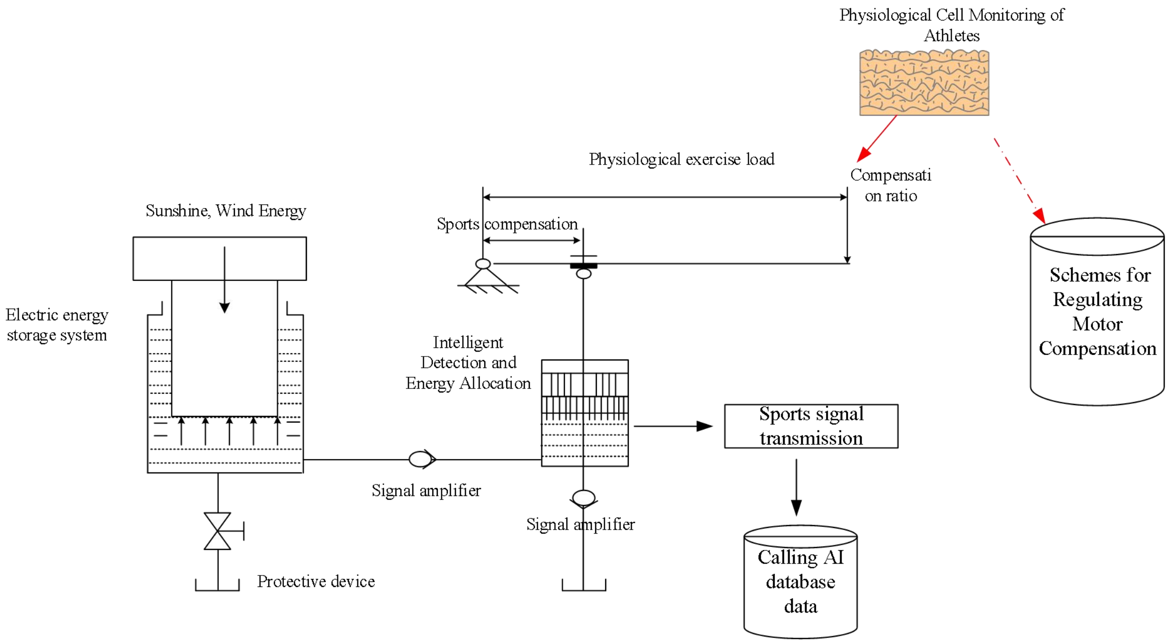

Fig. 2. The Overall Structural Module Design of the System

As shown in Figure 2, the overall architecture design of the smart photovoltaic cell switching system includes the main sports activity load status parameters, such as the maximum oxygen absorption capacity VO2Max, ventilation volume per breath VE, oxygen pulse O2P, heartbeat rate HR, etc. All of the above parameters can be displayed on the LED screen in the smart photovoltaic cell switching system to better understand and optimize the above parameters.

In general, this study constructed an integrated information processing model to monitor the load state characteristic parameters of sports. Smart photovoltaic cell switching system according to the VO2max, O2The index parameters of P and METs were monitored and information fused as shown in Figure 3.

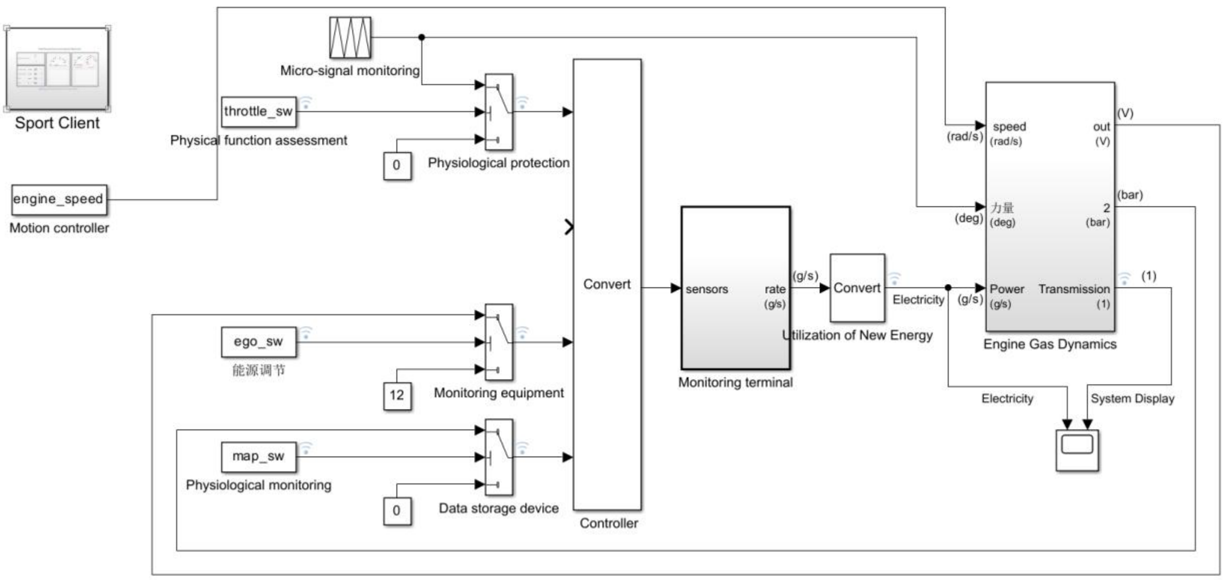

Fig. 3. Sports Load Status Monitoring and Information Fusion Processing

B. Monitoring of Sports Load Distribution by the Intelligent Photovoltaic Cell Switching System

Using the intelligent photovoltaic cell switching system, the study specially constructs the IoT control module of the sports load status monitoring system, which is networked through the ZigBee. This study uses DM9000 as the information processor and selects MAX8660 as the output control bus of the system, thus completing the hardware design of the smart photovoltaic cell switching system (Figure 4).

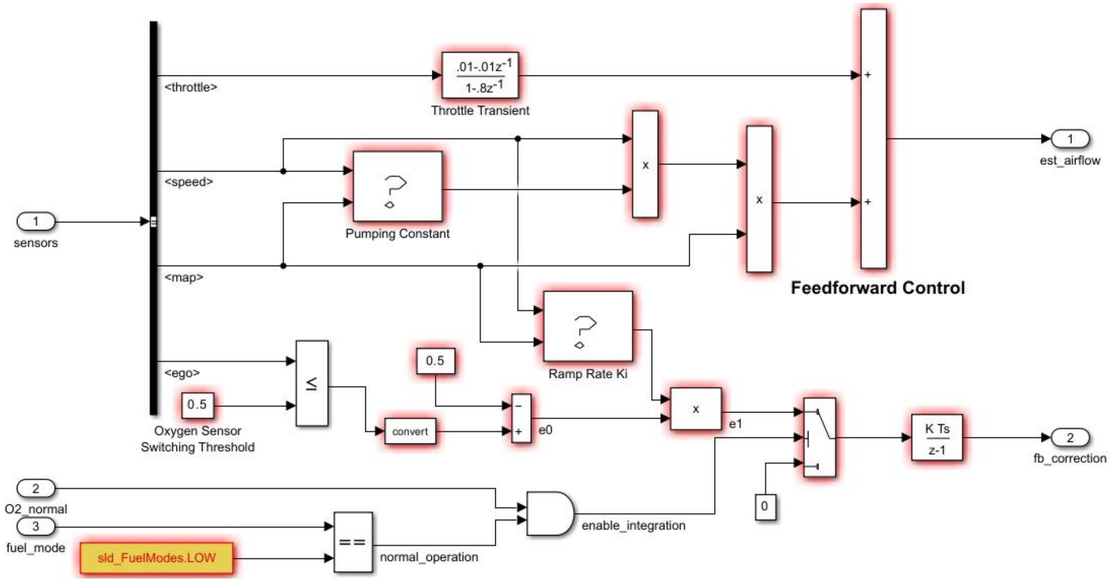

Fig.4. System Hardware Integration Design

In this study, the data acquisition frequency of 28~30 kHz in the smart photovoltaic cell switching system was set in the monitoring of sports load status, and the interference intensity was set at -50 dB. The specific distribution of parameter acquisition indicators is shown in Table 1.

Table 1. Distribution of Parameter Acquisition Indicators

	Velocity	**Strength**	**Stamina**	**Explosive**
Max[VO_2]	35, 45	2, 25	4, 32	2, 32
O_2P	321, 110	21, 2342	132, 345	132, 456
MET_2	0, 9	1, 8	1, 9	0, 9

According to the information provided above, the study examined the load of physical activity and obtained the relevant inspection results (Figure 5).

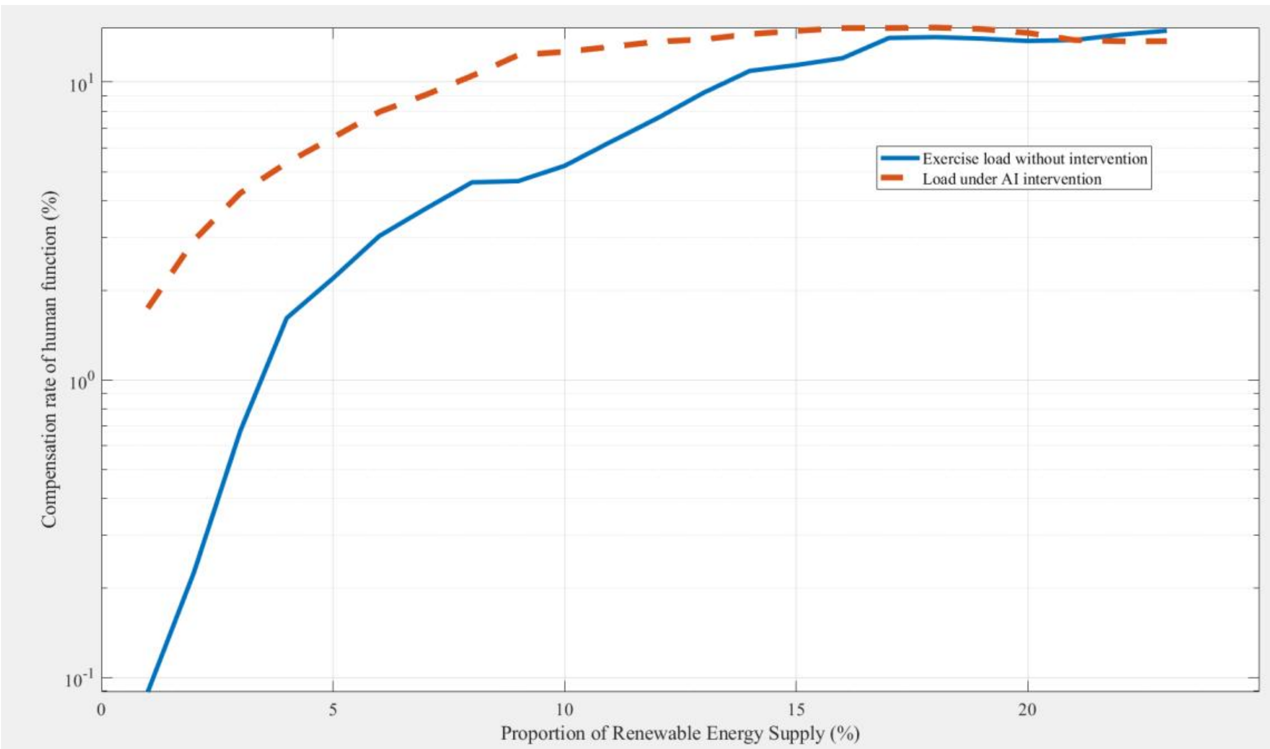

Fig. 5. Monitoring Results of Sports Load Status

The interpretation of Figure 5 shows that the matching degree of the output of this study is quite excellent when monitoring the load of physical activity,reliability of the sport load status and corresponding results were obtained (Figure 6).

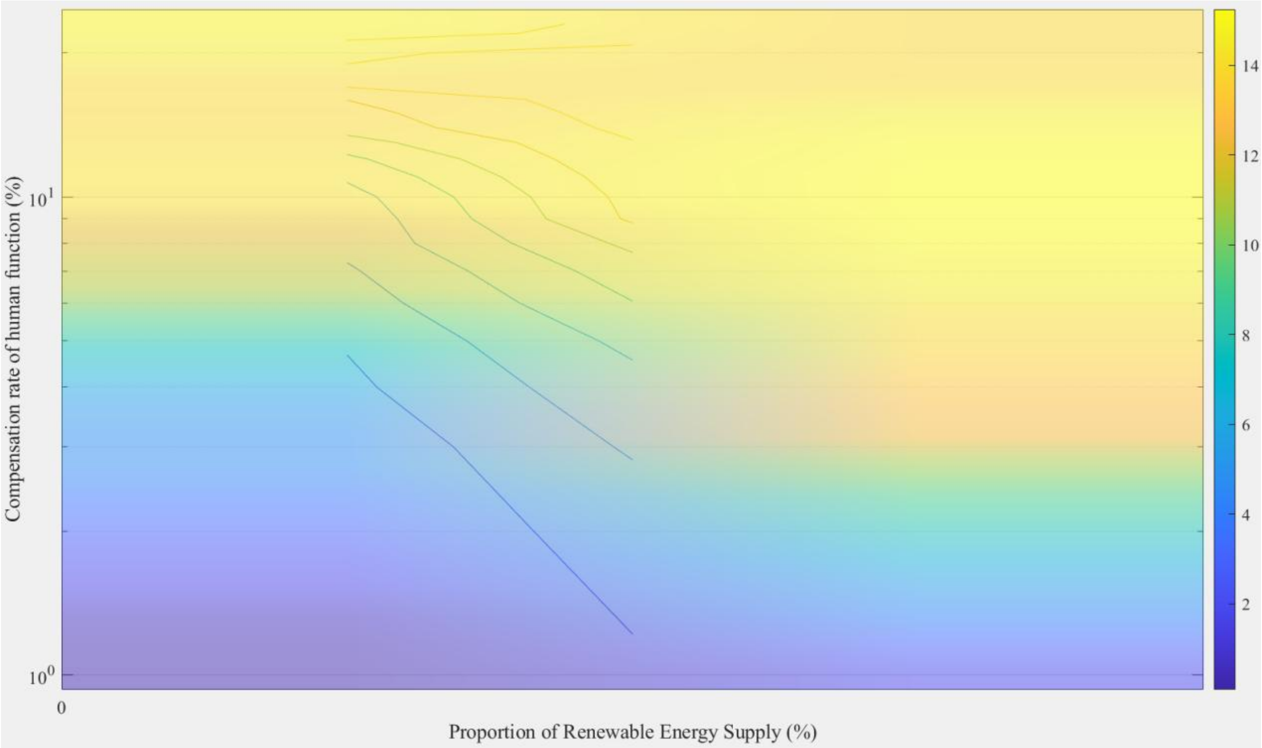

Fig.6. Output Reliability Index Test

As can be seen from the interpretation of Figure 6, the study method is excellent in the integration of characteristic parameters in the load status check of physical activity. The monitoring of sports parameters has high accuracy, strong real-time performance, and excellent performance in the monitoring and output information fusion of sports load characteristic parameters.

4. Conclusion

Through the analysis of the sports load status characteristic parameters, this study can obtain the optimized sports status monitoring results. Based on the results, in the monitoring of sports load status, the data acquisition frequency of 28 to 30 kHz can reach -50 dB, and the maximum oxygen uptake VO2, the number of max indicators reached 33.21 ± 3.09 and O2, the number of P indicators is 362.57 ± 98.71, and the number of METs is 9.06 ± 1.21. Therefore, it is known that there is a positive correlation between the distribution of sports load. Therefore, based on the guidance of sports process management and health training, can effectively improve the pertinence and effectiveness of sports training.

Through the strict calculation of the characteristic parameters of sports load status, this study can get better monitoring of sports status, thus increasing the target and efficiency of the application of the intelligent photovoltaic cell switching system to the distribution of sports load. Therefore, this study proposes a monitoring mode of sports load distribution based on the smart photovoltaic cell switching system. Through the trigger strategy of Sync / Trigger, the study is able to perform the issuing of control commands and the management of information, and to create a cluster model of sports load status through the three-terminal estimation technology. Based on the final maximum oxygen uptake VO2max, O2P, METs and other index parameters, the monitoring of sports load status and information processing. After in-depth analysis, this study found that this research method has high information processing ability in the monitoring and parameter analysis of sports load status characteristics, and its monitoring results are stable and reliable, which can effectively guarantee the safety of sports. This proves that the smart photovoltaic cell switching system has a positive impact on the distribution of sports load.

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