

## Вопросы на perplexity.ai

### *Вопрос на русском*

Как реализовать мониторинг большого физического детектора, чтобы уменьшить нагрузку на администраторов ?

#### Sources

<https://mlsd2021.ipu.ru/proceedings/1574-1584.pdf> favicon

<http://sv-journal.org/2014-1/01/index.php?lang=ru> favicon

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#### Answer

To implement monitoring for a large physical detector in order to reduce the load on administrators, several strategies can be considered based on the existing literature.

Strategies for Implementing Monitoring of a Large Physical Detector

**Online and Offline Monitoring:** Implement both online and offline monitoring systems to efficiently manage the data from the physical detector. Online monitoring allows for real-time data analysis, while offline monitoring can be used for more comprehensive analysis of the collected data 1.

**Utilize Specialized Detectors:** Consider using specialized detectors designed for efficient monitoring of nuclear reactors or other large-scale physical systems. For example, the use of antineutrino detectors has been proposed for effective monitoring of nuclear power plants.

**Operational Data Monitoring System:** Implement an operational data monitoring system that works in conjunction with individual detectors of the experimental setup, data collection systems, and control and management systems. This can help in real-time monitoring and management of the physical data.

**Scalability of Detector Systems:** Ensure that the detector systems are scalable to handle the large volume of data generated by the physical experiment. Interaction of nuclear particles with the detector material leaves an information trace, and the scalability of the detector systems is crucial for efficient monitoring.

Visualization for Monitoring: Consider implementing a visualization system for the experiment to aid in monitoring. Visualization of events from the experiment can provide valuable insights and aid in the monitoring process.

By implementing these strategies, it is possible to reduce the load on administrators while efficiently monitoring a large physical detector.

These strategies are based on the existing literature and can provide a comprehensive approach to implementing monitoring for a large physical detector.

### *Вопрос на английском*

How to implement the monitoring of the large physics detectors ?

Sources

<https://www.sciencedirect.com/science/article/abs/pii/S016890029601176X>

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<https://cds.cern.ch/record/2296574/files/1801.10414.pdf> favicon

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Answer

To implement the monitoring of large physics detectors, several approaches and tools can be considered based on the provided search results:

**Detector Control System:** Implement a detector control system for the physics experiment to monitor a large number of indicators and provide timely control. This can help in meeting the experimental requirements and ensuring efficient monitoring.

**Utilize Specialized Detectors:** Modern particle detectors consist of layers of subdetectors, each designed to look for particular properties or specific types of particles. Tracking devices, calorimeters, and particle-identification detectors can be used to gather clues about particles, including their speed, mass, and charge, which can aid in monitoring the behavior of the physical detector.

**Artificial Neural Networks:** Train a classifier capable of detecting known anomalous behaviors with unprecedented efficiency using artificial neural networks. This approach can be used to monitor the large hadron collider experiment at CERN.

**New Technologies for Monitoring Alignment:** Consider new technologies for monitoring the precision alignment of large detector systems. Inexpensive systems

are available for performing dynamic, high-resolution measurements of the mechanical alignment between components of a detector system.

**Online Monitoring Framework:** Implement a generic online monitoring framework, such as DQM4HEP, designed for use as a generic online monitor for particle physics experiments. This framework can be used to monitor multiple detector prototypes with slightly different requirements regarding the format of the data to be analyzed.

By considering these approaches and tools, it is possible to effectively implement the monitoring of large physics detectors, ensuring efficient data collection, analysis, and control while reducing the load on administrators.