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Application for Anomaly Detection in the Storage Ring Power Supplies of APS-U

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After the upcoming upgrade, the storage ring in the Advanced Photon Source (APS-U) will have over two thousand magnet power supplies. They will be constantly monitored in order to prevent impeding failures, when possible. The new data acquisition system (DAQ) will deliver 22600 samples of each power supply's current per second. The data can be saved at this rate for a short period of time around a suspected anomaly. However, continuous data logging is more feasible at a smaller rate. In this contribution, we present (1) a statistical plug-in for the DAQ, which allows to reduce the data rate for logging, while capturing the most important statistical properties of the raw data, (2) a number of machine learning models for anomaly detection in the compressed data, and (3) an application with a graphical user interface to review the detected anomalies.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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