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OR23 - Transitioning the Use of Machine Learning from Physics Study to Production Operation*

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“The Spallation Neutron Source (SNS) at the Oak Ridge National Laboratory (ORNL) is a megawatt class neutron production proton accelerator. The facility is undergoing a beam power upgrade from 1.4 MW to 2 MW and increasing the yearly scheduled neutron production operating time from 4500 to 5000 hours. One area of focus is to utilize machine learning to try to help achieve these lofty operational goals. Two areas of focus for machine learning are prediction of potential equipment malfunction with automated beam turn off and automated beam tuning to minimize residual radiation levels. Utilizing archived data machine learning studies have shown the ability to predict upcoming faults, and additional studies are underway to understand whether automated machine learning based beam loss reduction is possible. Even after proof of principle, the difficulty for both cases comes when trying to transition the use of machine learning from physics study to production operations. Processes for making the move to operations at SNS will be discussed.

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Session Classification: How Does the Machine Learning Integrate with Operation?