

Abstract: Building a sustainable and accessible future for dark matter analysis, Y1

XSEDE resources are requested to continue and improve a service that delivers a dark-matter analysis environment over the web. This service is currently in use as a resource for analysis within the Super Cryogenic Dark Matter Search (SuperCDMS), which searches for low-mass, weakly-interacting dark matter. With continued support, we intend to use this resource as the backbone of our outreach activities. SuperCDMS PIs plan to use this resource for graduate-level data analysis workshops and workshops that help early-career scientists across the dark matter community learn about signal processing and low-statistics analysis. We also hope to partner with additional SNOLAB-based experiments to provide hands-on outreach activities for undergraduate students.

We also intend to use this platform for ongoing SuperCDMS analysis. We expect this to improve our ability to work with summer research students because accessing the system takes less than a day. In addition, using the platform for ongoing analysis hardens and improves the system, ensuring that it is ready for public-facing workshops.

Specific projects we intend to use Jetstream for are (1) reproducing a recent limit result and (2) exploratory studies for automated data quality monitoring. Attempting to reproduce a recent analysis will stress-test the system using a full-sized data set in a container with only the installed SuperCDMS software. Automated data quality monitoring (2) has the potential to provide rapid feedback to SuperCDMS shifters and to improve the overall percentage of science data. This is particularly critical for the SuperCDMS experiment as our primary signal is small and fluctuations in the noise environment can make data unsuitable for our flagship low-threshold and annual modulation analyses.