Contribution ID: **29**   Type: **Poster (In person)**

Data Acquisition at MIRACLS

Wednesday 29 November 2023 17:54 (1 minute)

The Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy (MIRACLS) is a new experiment in the ISOLDE facility at CERN which aims to conduct collinear laser spectroscopy (CLS) on exotic nuclei with low production yields by exploiting a 30-keV multi-reflection time-of-flight (MR-ToF) device [1]. Ions bunches prepared by MIRACLS'Paul trap are sent into the MR-ToF instrument, where they are reflected back and forth between two electrostatic mirrors. Hence, the ion bunch interacts with a laser beam thousands of times before leaving the device, which yields a significant boost in sensitivity over conventional,single-passage CLS.

Data acquisition for MIRACLS comes with its own unique set of challenges, such as processing larger amounts of raw data (compared to single-passage CLS) from the photo-multiplier tubes used for photon detection (up to a few gigabytes per frequency scan), building an intuitive graphical user interface (GUI) for data collection, and integration with the MIRACLS experiment's EPICS-based control system.

In this poster contribution, I will present how we faced these challenges. For the data processing, we aggregate the data into bins, which facilitates fast and efficient online analysis, e.g. during the experiment itself, while saving the full data files (containing every detected photon event) to an external hard drive. For building the data acquisition GUI, we utilized "spinmob,"a Python package developed at McGill University based on the Qt framework [2]. Finally, we used the pyepics Python package to control and monitor EPICS process variables from within the data acquisition GUI, allowing us to integrate the GUI into our control system.

[1] F. Maier et al., NIM A 1056 (2023), 168545
[2] Spinmob GitHub repository. https://github.com/Spinmob/spinmob.

Author: ROITMAN, Anthony (McGill University, (CA))

Co-authors: Prof. BUCHINGER, Fritz (McGill University); MALBRUNOT, Stephan (TRIUMF (CA))

Presenter: ROITMAN, Anthony (McGill University, (CA))

Session Classification: Poster Session