TRIGGER work plan during 2024 summer shutdown

D. Torretta for the Trigger WG
ICARUS Technical Board Meeting
June 14, 2024

Trigger work during the 2024 summer shutdown -1

Hardware related work

- Test new spare NI Controller #8861 with RT Linux OS in the production system
- Test old production PharLap RT Controller #8840 [with new installed hard drive] to check if it can be fully recovered
  - good to have an extra spare
- Implementation of automatic detection of the NI RT Controller(s) OS (PharLap and Linux OS) to
  - load correct LabVIEW libraries and drivers
  - facilitates the swap controllers at different OS and be able to start triggers with minimal downtime
- Upgrade LabVIEW version from LabVIEW 2020 to LabVIEW 2024 (CERN is in the process of testing this as well)
  - The PharLap OS wont be supported from LabVIEW >=2021 so we MUST switch to use RT LINUX controllers

Trigger work during the 2024 summer shutdown -2

Hardware related work

- Increase the FPGA clock speed to 100MHz
    - reduce the clock cycle to 10ns instead of current 25ns @40MHz
    - In case 100Mhz clock is not feasible, we can certainly run at 80MHz.
- Synchronize the East/West reset of the PMT time stamps by PPS.
    - Due to the different ground lines between the East/West cryo modules, the East PPS signal distribution requires an optical converter for ground isolation. This converter introduces a few ns delay in the PPS signal received by the East PMT boards with respect to the West ones, resulting in a East/West difference in the recorded PMT time stamps.
    - This time difference can be fixed by installing a second optical converter or by adding a proper delay (cable) in the West PPS distribution.
- Swap spare and production Windows desktops / purchase a new desktop
    - spare desktop is newer and faster than production desktop but are both fairly old

Daq/ Data collection/ Monitoring

- Collect high samples of Minimum bias data and triggered cosmic data whenever possible
- Work (again) on implementing automatic start of the trigger when starting a run
- Implement trigger monitoring via Web browser