Contribution ID: **41** Type: **Poster**

Development of fast electronics for the muon entrance detector of the PSI muEDM experiment

Saturday 20 April 2024 17:05 (5 minutes)

The investigation of a permanent electric dipole moment (EDM) in elementary particles offers a compelling avenue to explore Charge-Parity symmetry violation, a phenomenon intimately connected with the observed matter-antimatter asymmetry in the universe. The Standard Model (SM) of particle physics predicts an exceedingly small muon EDM, on the order of $10^{-38}\ e \cdot cm$. However, several Beyond the Standard Model (BSM) theories suggest mechanisms that could significantly enhance this value. Our research at the Paul Scherrer Institute (PSI) is focused on detecting the muon EDM with an unprecedented sensitivity target of $10^{-23}\ e \cdot cm$ using the frozen-spin method. Our group has been developing a muon entrance trigger system crucial for the muon injection and storage. The system consists of plastic scintillators read out by silicon photomultipliers (SiPM). It is engineered to trigger on muons within the acceptance phase space and send a trigger signal within 30 ns to a pulsed magnetic field system. This pulsed magnetic field will stop the incoming muon in the central region of a solenoid. This stringent timing requirement has propelled us to undertake significant research and development in SiPM readout electronics to minimize all possible system delays. Recent progress in the R&D of this electronics will be presented.

Author: HU, Tianqi

Presenter: HU, Tianqi

Session Classification: Poster (For two days)