

## T-Violation experiment at TRIUMF-ISAC using polarized $^8\text{Li}$

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The MTV experiment (Mott Polarimetry for T-Violation Experiment) starts physics data taking at TRIUMF-ISAC, aiming to achieve the highest precision test of time reversal symmetry in polarized nuclear beta decay by measuring a triple correlation ( $R$ -correlation), motivated to search for a new physics beyond the Standard Model [1]. In this experiment, the existence of non-zero transverse electron polarization is examined utilizing the analyzing power of Mott scattering from a thin metal foil. Backward scattering electron tracks (“V-tracks”) are measured using a planer multi-wire drift chamber. The first physics data taking of the MTV experiment was performed at TRIUMF-ISAC in 2010 using an 80% polarized  $^8\text{Li}$  beam at  $10^7$ pps, achieving the highest statistical precision of order of 0.1% on the  $R$ -parameter comparing to the previous study performed at PSI [2]. Analysis results from this experiment will be presented in the conference with the systematic error analysis.

The next generation cylindrical drift chamber (CDC) has also been developed after the first run aiming to suppress the dominant systematic effects in the planer drift chamber, which arises from combination of the parity violating beta-emission angular distribution and the asymmetric planer geometrical acceptance. It cannot be canceled by the beam spin flipping, so usage of a symmetric acceptance detector can drastically reduce this systematic effect. We have commissioned the CDC at TRIUMF from 2011, and finished testing the full detector setup. The next physics run are scheduled to be performed in 2013. Project status together with the technical R&D aspects of the next generation experiment using the CDC will also be introduced in the conference.

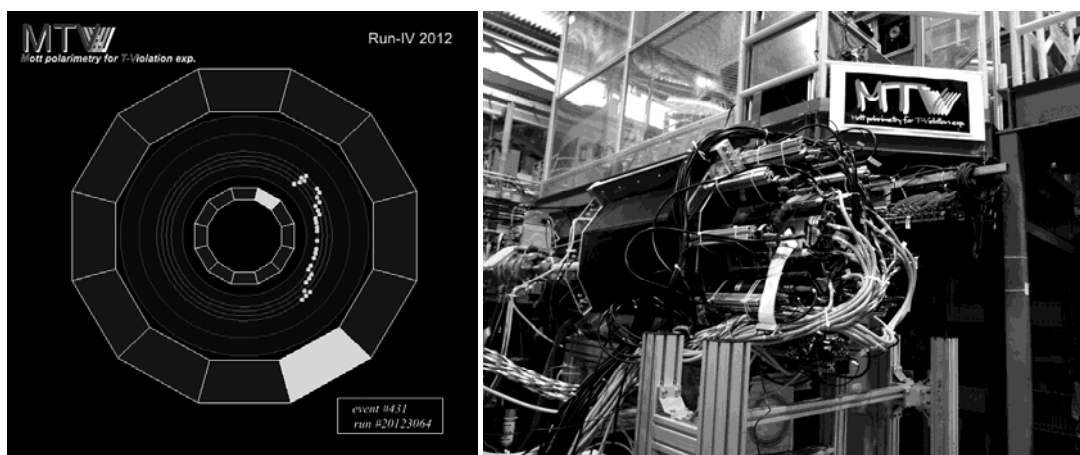


Figure 1: A typical V-Track event (Left) measured using the CDC setup (Right).

[1] J. Murata et al., J. Phys. CS 312, 102011 (2011).

[2] R. Huber et al., Phys. Rev. Lett. 90, 202301 (2003).