

THE MTV EXPERIMENT: FROM T-VIOLATION TO LORENTZ-VIOLATION

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The MTV (Mott Polarimetry for T-Violation) experiment is running at TRIUMF-ISAC (Isotope Separator and ACcelerator), aiming to search a large T -Violation in polarized Li-8 beta decay, by means of measuring a triple vector correlation, R , in the beta decay rate function. Left/Right backward scattering asymmetry of Mott scattering from a thin metal foil, is measured by utilizing an electron tracking detector consists of a cylindrical drift chamber.

To achieve 10ppm precision in the Mott scattering asymmetry, we have performed many studies on the expected systematic effects. Sources of the systematics are now identified, then, calibration systems have been developed to evaluate the fake effects. The physics data taking is scheduled in this year, in order to significantly improve the result of our previous measurement which achieved 100ppm precision in 2010, using the first generation detector, planer drift chamber, at TRIUMF. The data taking status, together with the results of the newly known systematics, will be presented.

In addition to the T -Violation, we are also preparing to test Lorentz invariance in weak sector, by applying our Mott analyser system. Unexplored Lorentz-Violating correlations are possible to be tested using the MTV experimental setup. The testing principle and preparation status will be also presented.