# Development of a New Drift Chamber based Mott Polarimeter

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A new Mott polarimeter using multi-wire drift chamber has been developed. Plastic scintillators were conventionally used to measure the scattering asymmetry on Mott scattering, however, in order to significantly improve the efficiency and accuracy we employ multi-wire drift chamber.

The transverse polarization of electrons can be determined with the measurement of the asymmetry that arises due to scattering of electrons from high-Z nuclei. The plastic scintillators based polarimeter is susceptible to backgrounds and have a small solid angle. To overcome the problems, we use the 3-dimensional tracking detector. Putting the tracking detector between an electron source and a scattering foil, both tracks before and after scattering can effectively be detected. Because Mott scattering shows a high sensitivity to the electron polarization, especially at large scattering angles. Consequently, tracking detector based polarimeter can get the high efficiency from the large solid angle and reduce dominant backgrounds.

We have developed multi-wire drift chamber that has high spatial resolution. The active area is 300mm×440mm, 6 anode planes of XX'UU'VV' consist of anode wires (20$\mu$m Au-W alloy) with 20mm spacing. For the charge readout preamplifier the REPIC RPA-130 64ch chamber preamp card is used. The ECL discriminated signals fed into the input of the time-to-digital converter (64ch AMT-VME module). Electrons are scattered back by a gold foil placed at the end of the wire chamber, the "V-tracks" can be reconstructed.

At the conference, the result of the measurement of the V-tracks using $\beta$ sources and Monte-Carlo simulation comparing the sensitivities of multi-wire drift chamber and plastic scintillator as Mott polarimeter will be presented.