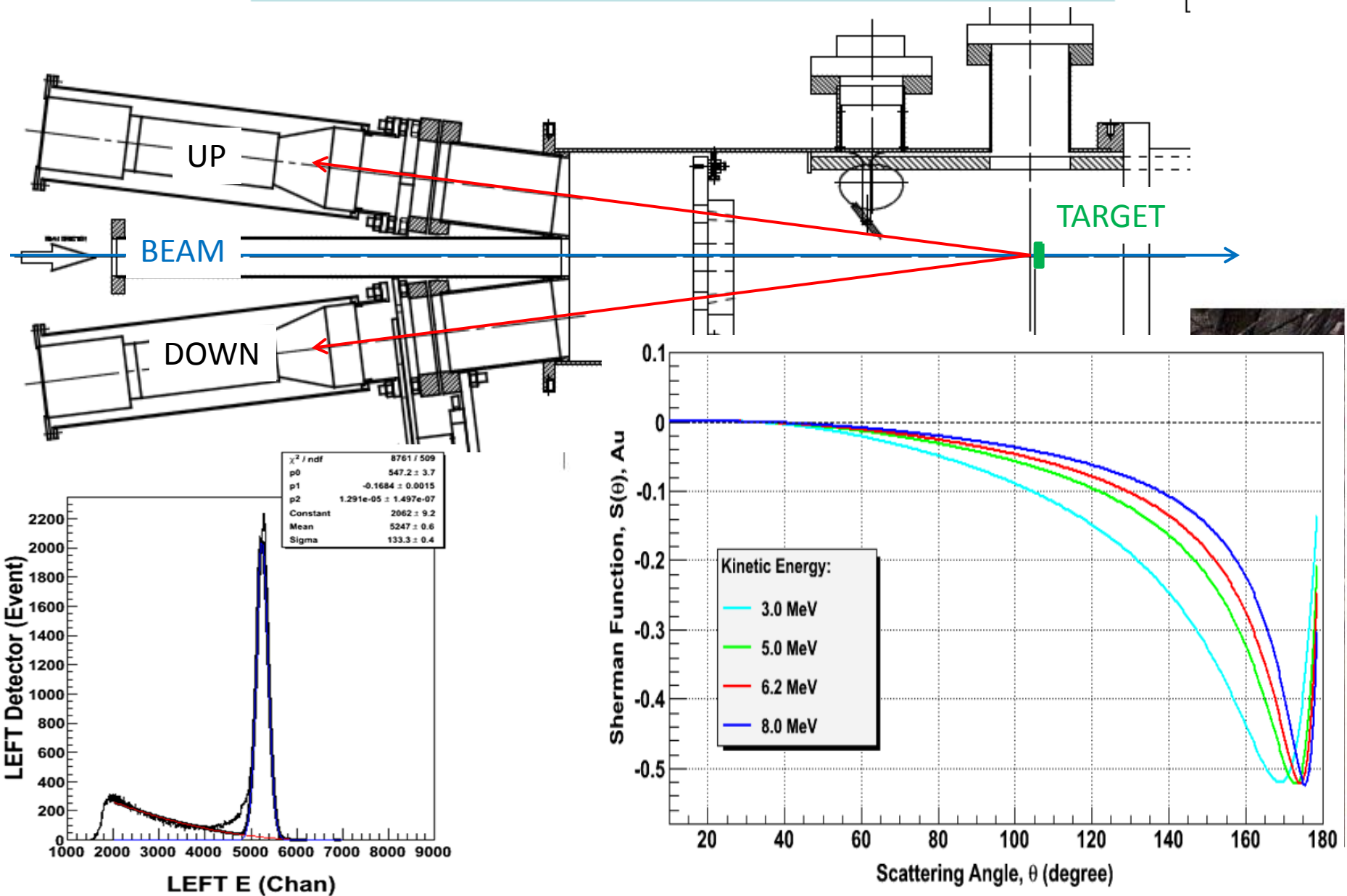
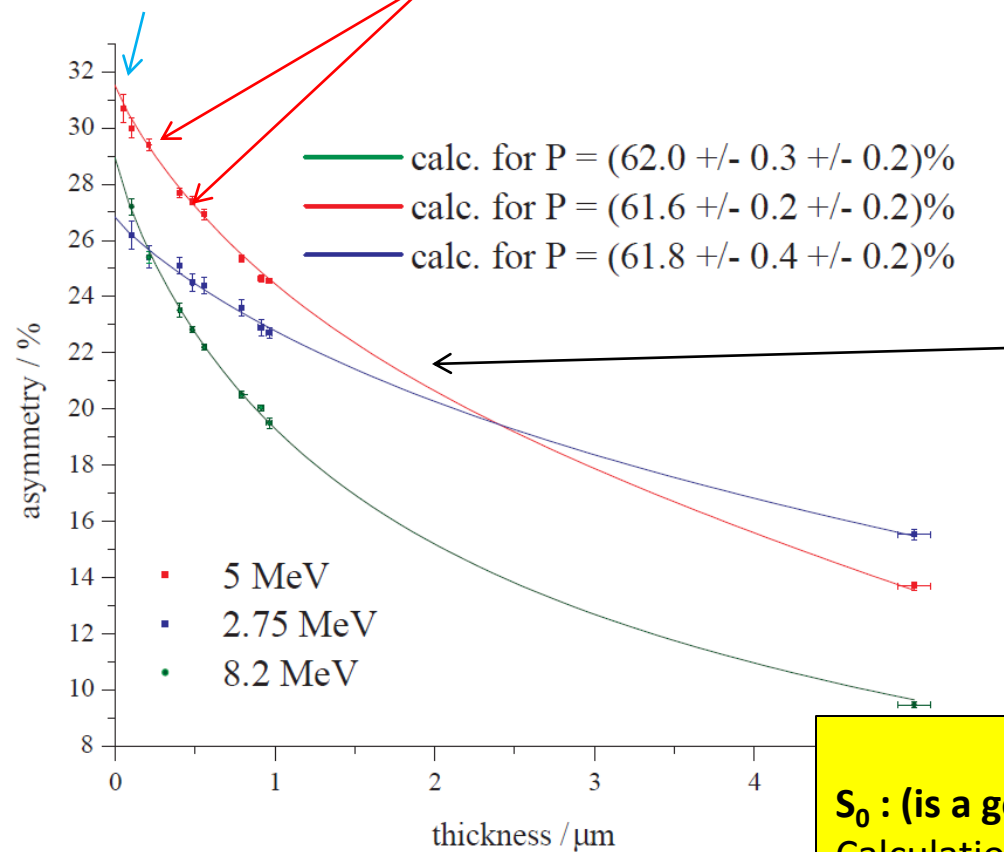


$$\sigma(\theta) = I(\theta)[1 + S(\theta)\vec{P} \bullet \hat{n}]$$



$$P = S_0 / A_0$$

$S_{\text{eff}}$  (effective analyzing power) depends on foils thickness



In late 90's Mott was calibrated and with help of Charles Horowitz a model-dependency was successfully tested.

The results and analysis were not well documented or published in a peer reviewed journal.

We would like to repeat the calibration & model-dependent analysis, ensuring sound theoretical treatment and exploring improvements in simulation

Our goal is to demonstrate high precision  $\sim 1\%$ .

### Strategy for Precision Mott Polarimetry

$S_0$  : (is a goal of  $< 0.5\%$  possible?)

Calculation and estimate of uncertainty on nucl. size

Size of radiative corrections and relative accuracy  $\sim 30\%$  ?

$A_0, S_{\text{eff}}$  : (goal  $< 0.5\%$ )

Strategy is to provide simulation without approximation

Apply  $(\sigma, S, T, U)$  code/tables in Geant4 simulation

$A_{\text{exp}}$  : (goal  $< 0.5\%$ )

Target induced background : quantify by simulation

Instrumental and statistical uncertainties can be kept  $< 0.4\%$

