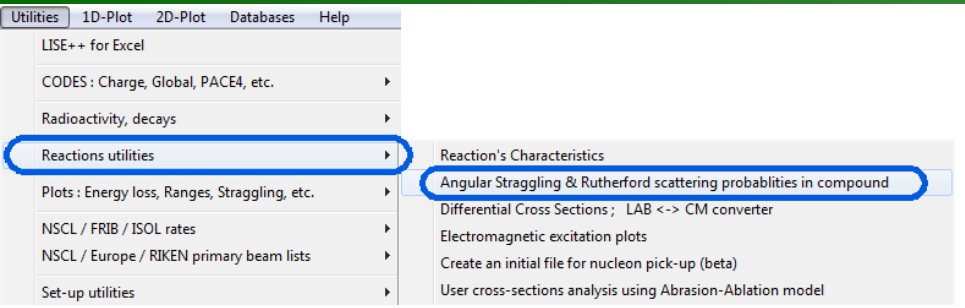
New utility: Rutherford scattering and Angular straggling in compound



These P=f(angle) and E=f(angle) functions will be used in the Monte Carlo mode for the primary beam transmission calculations

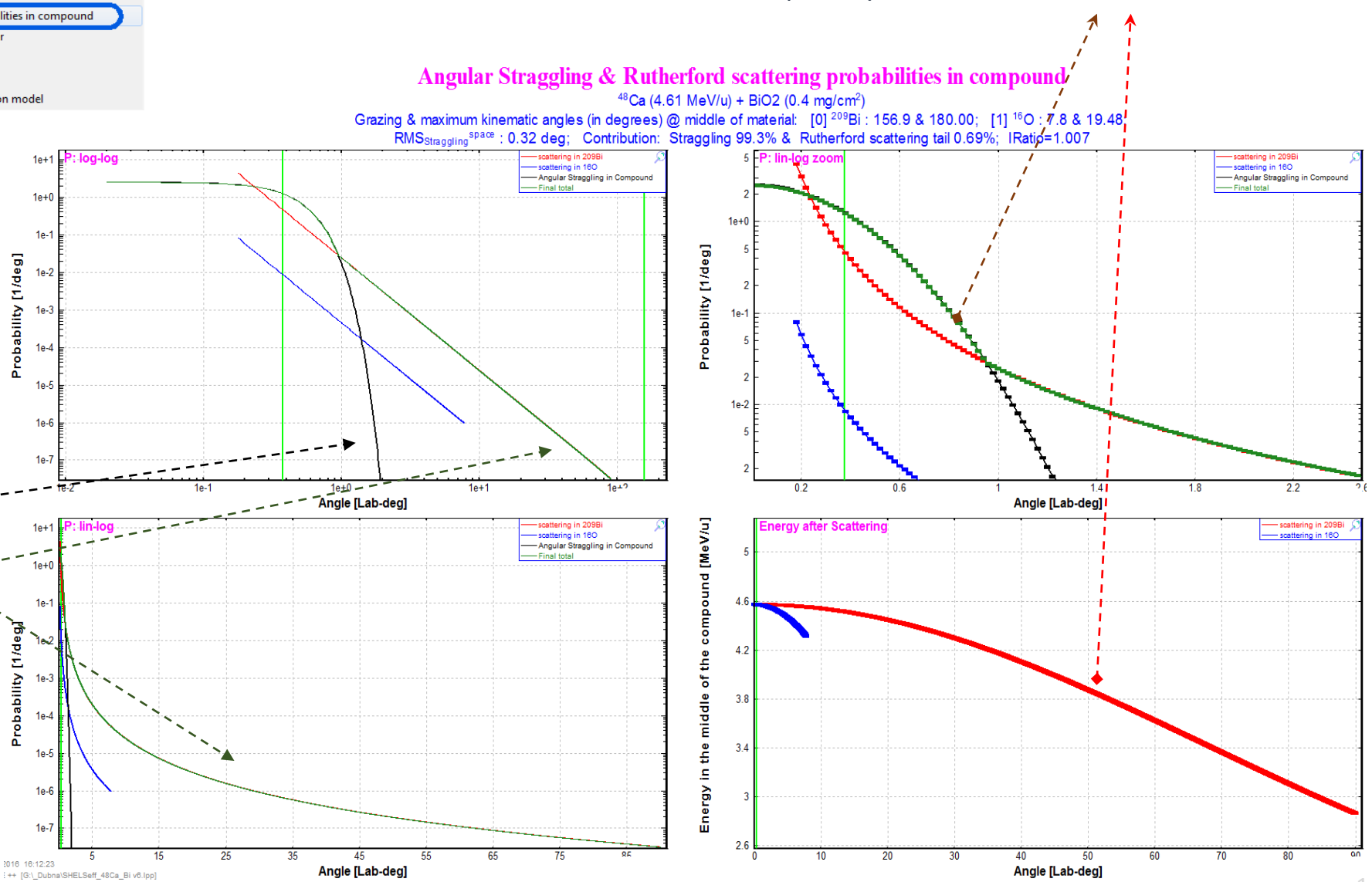
Angular straggling ≡ multiple scattering through small angles

How distinguish in Monte Carlo simulations ?

- Angular straggling (small angles)
- Rutherford scattering (large angles)

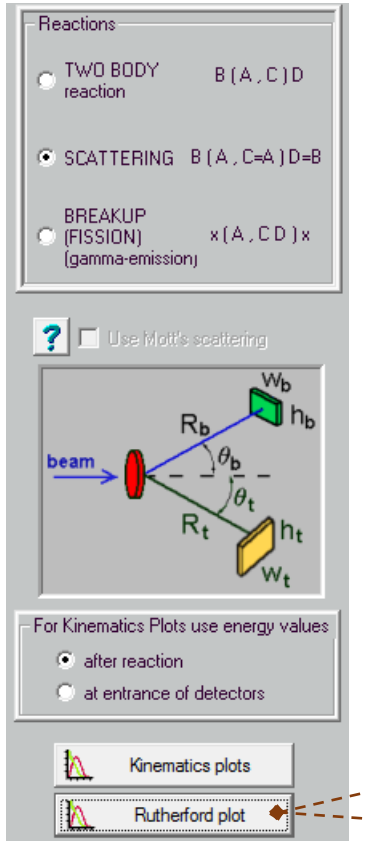
The nature is one for both processes.
It is necessary to have only one probability distribution for scattering process through a material segment.

Good benchmarks for angular straggling models!!
(Should be double crossing)



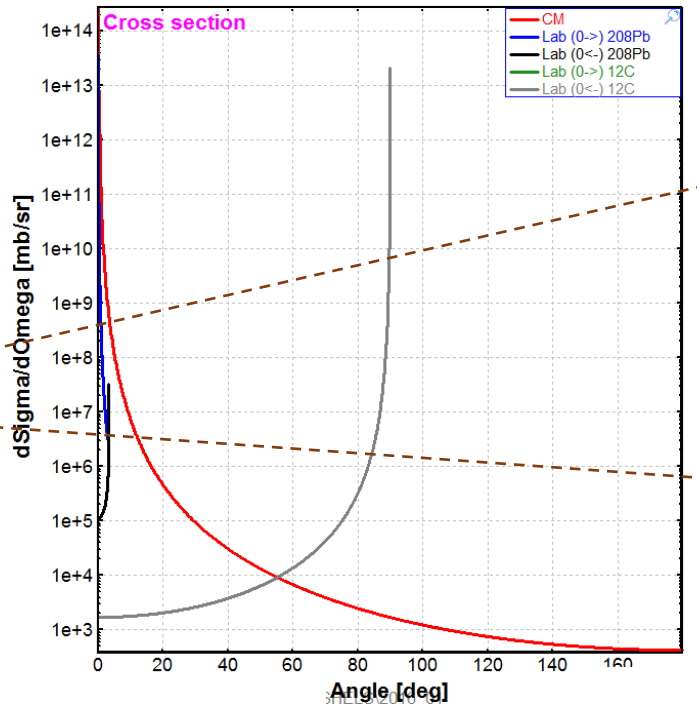
Update of Rutherford scattering in the Kinematics calculator

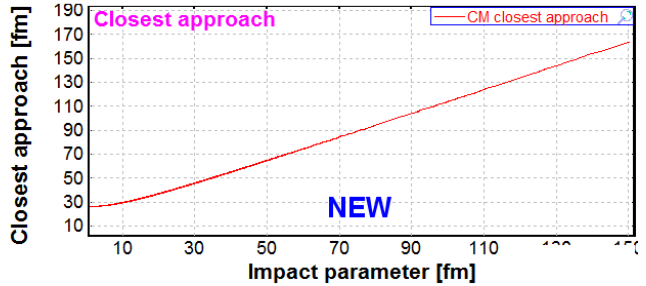
By product of Fusion reaction update and
“Rutherford scattering and Angular straggling” utility

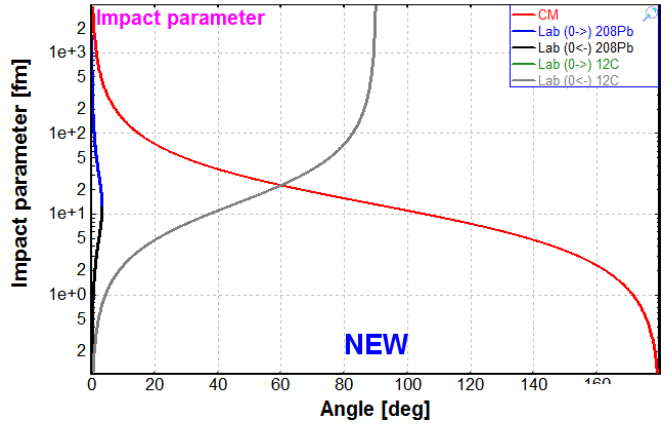


Rutherford scattering

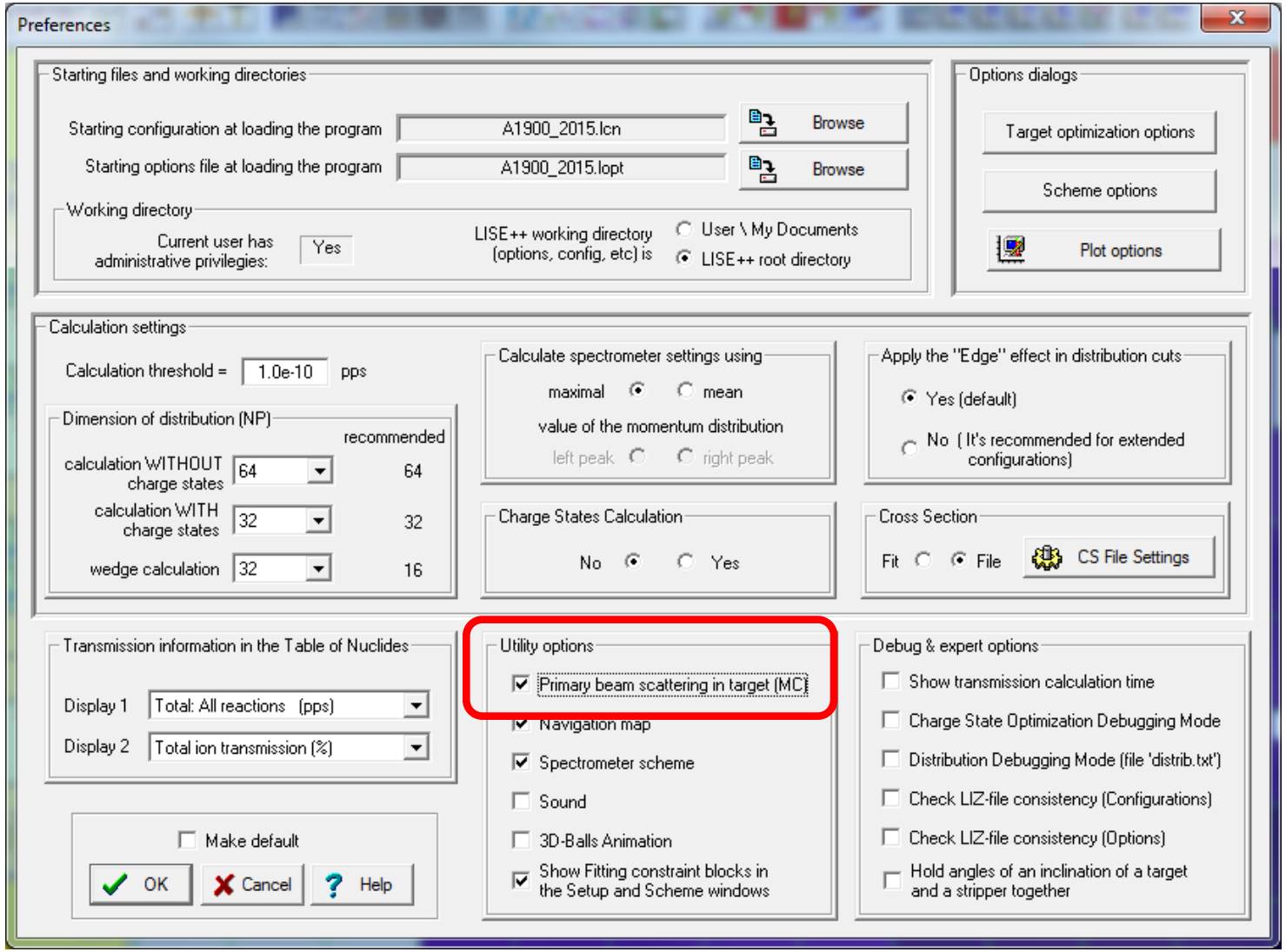
$^{208}Pb + {}^{12}C \Rightarrow {}^{208}Pb + {}^{12}C$ Projectile Energy at the reaction place: 2.39 MeV/u







Primary beam Rutherford scattering in target (only Monte Carlo mode)

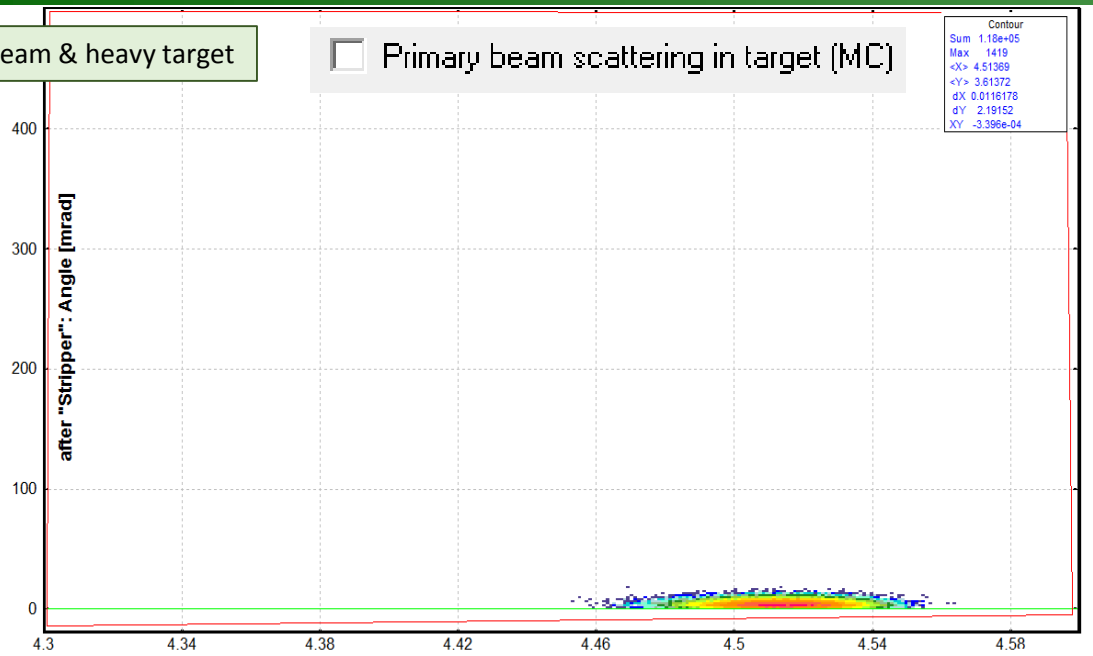


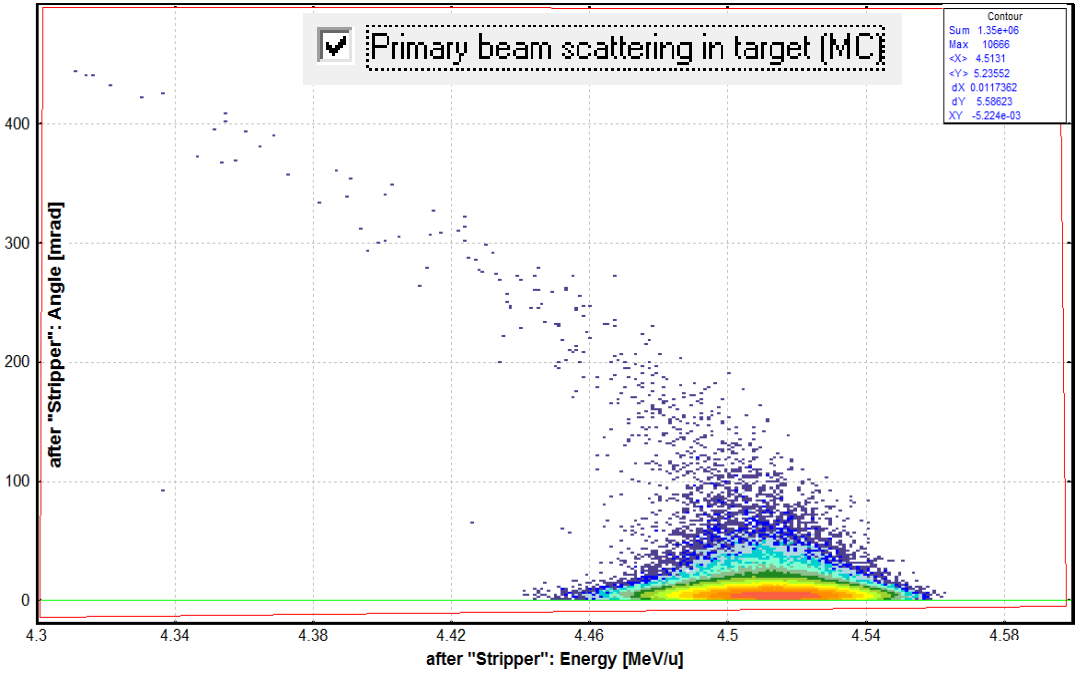
Rutherford scattering and Angular straggling

^{48}Ca (4.61 MeV/u) + Bi2O3 (0.39 mg/cm^2)

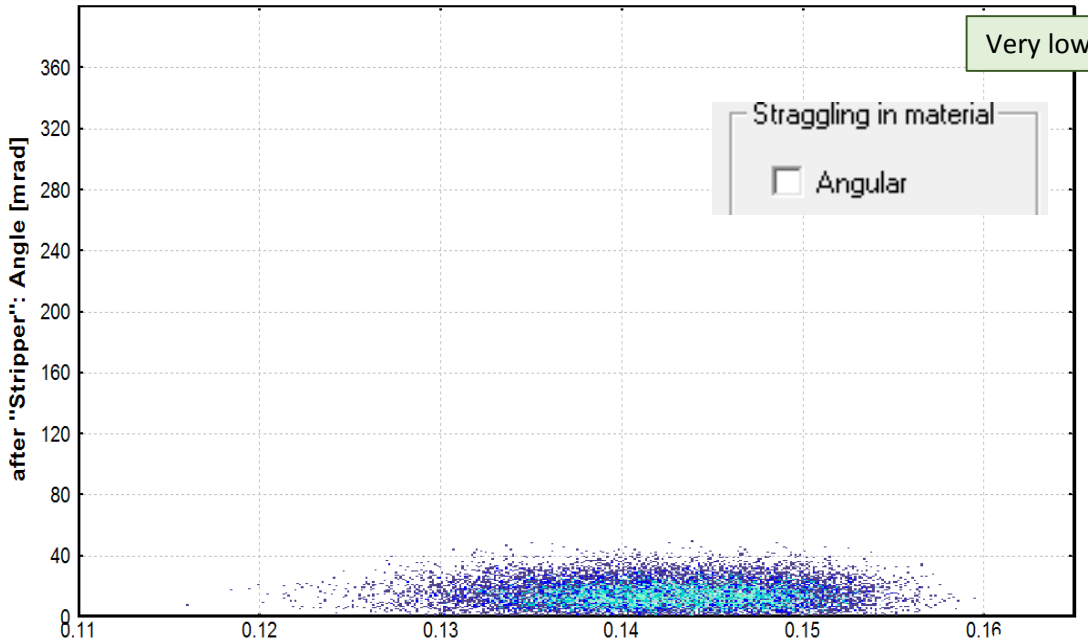
Light beam & heavy target

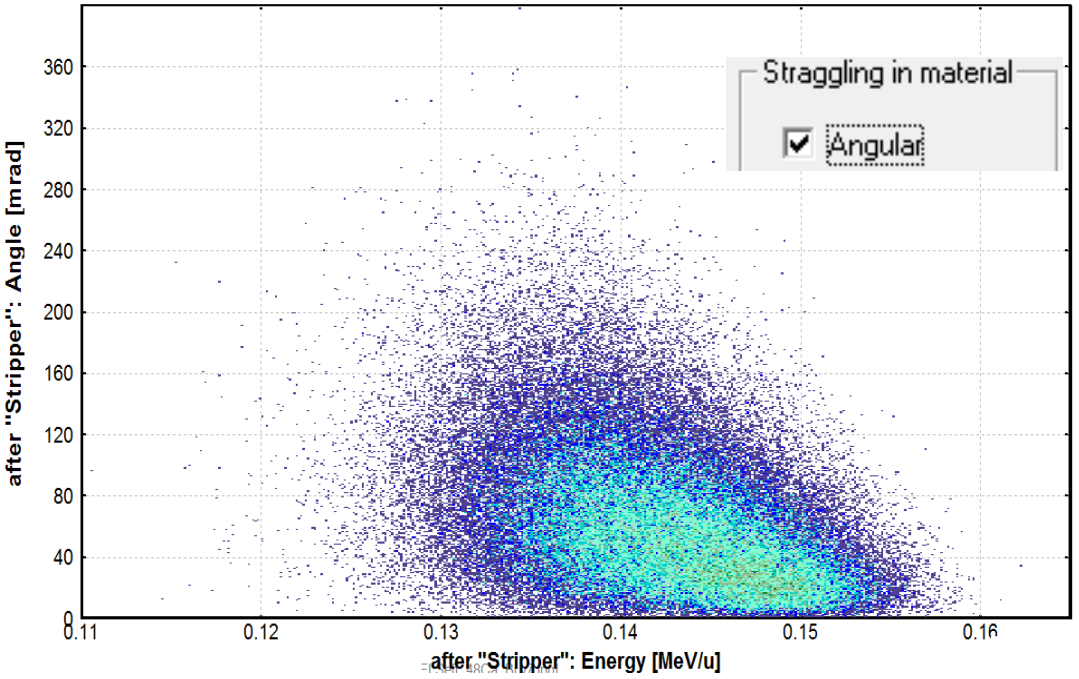
Primary beam (^{48}Ca)





Very low energy





Setting ions (^{255}Lr^{***+})

Primary beam scattering in recoil separators