I working on the simulation aiming for the understanding the BigBite acceptance in term of momentum and theta and phi. Currently working on the dipole only within the coil area (blue area in figure below).

The location of magnet and detector are known from the survey. The area where the dipole magnet is not so certain.

Simulation start with random momentum [0.2 to 1.2] GeV and angle theta and phi such that the dOmega = sin(theta)d(theta)d(phi) is uniform.

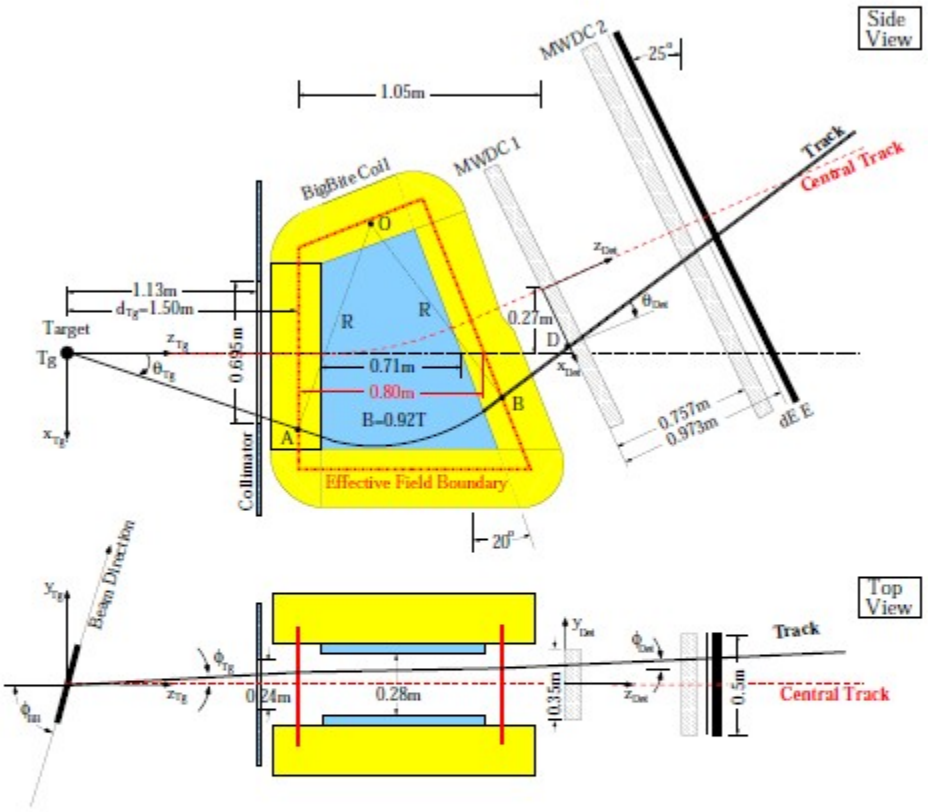
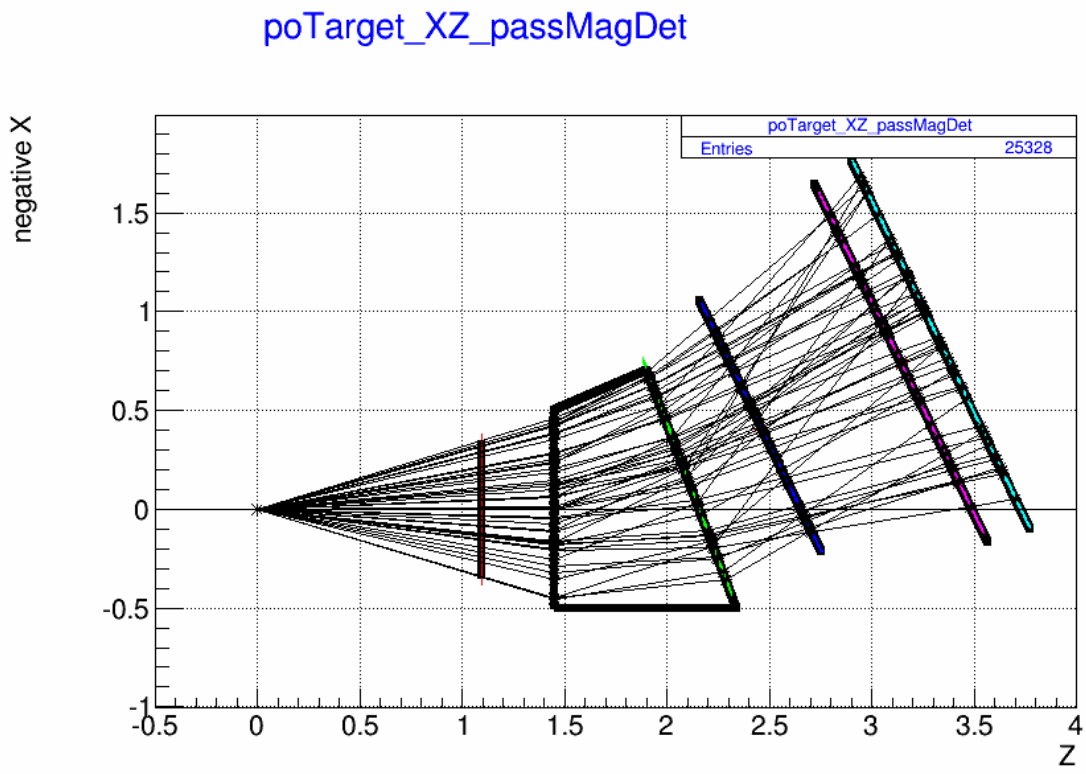


Figure 4: The schematic of the dispersive (top) and non-dispersive (bottom) planes of the BigBite spectrometer. Small angular deflections in the non-dispersive plane occur if the particle trajectory is not perpendicular to the effective field boundary [2, 19, 20]. At the entrance to the magnet, they are at most 18 mrad (close to the acceptance boundaries in the dispersive direction). At the exit field boundary, the effect acts in the opposite sense and partially cancels the deflection at the entrance.

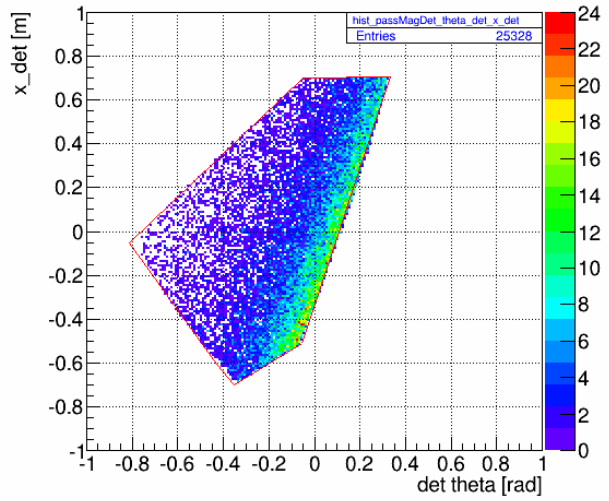
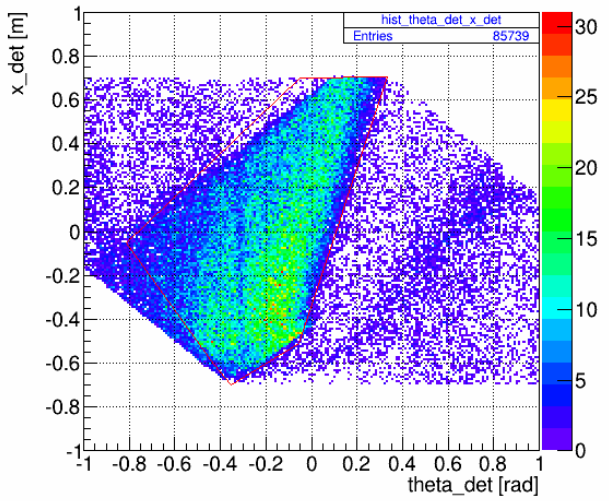
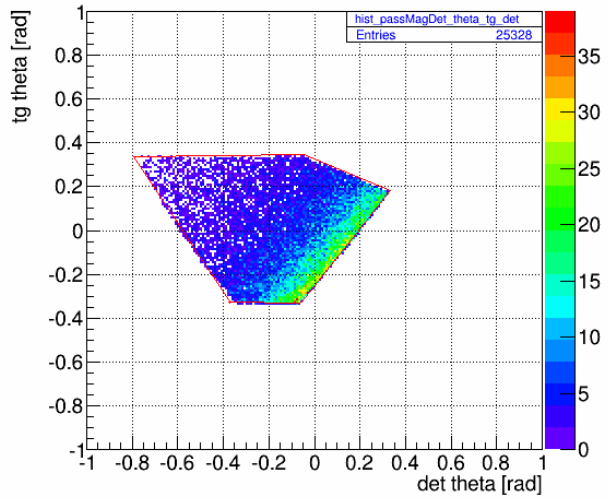
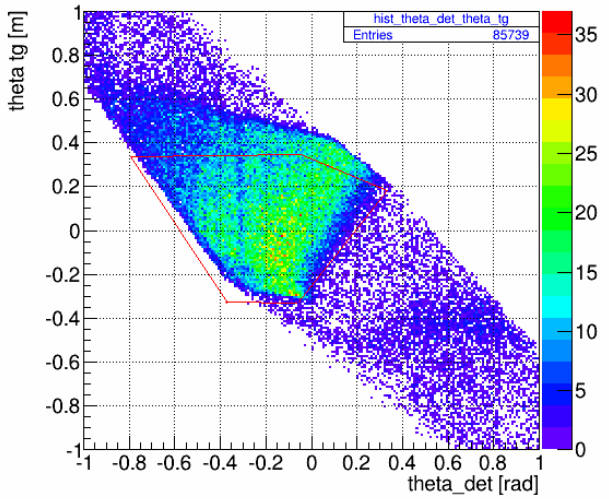


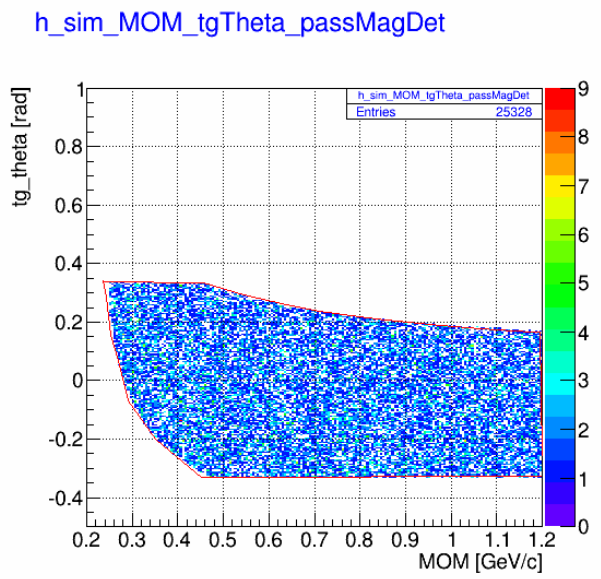
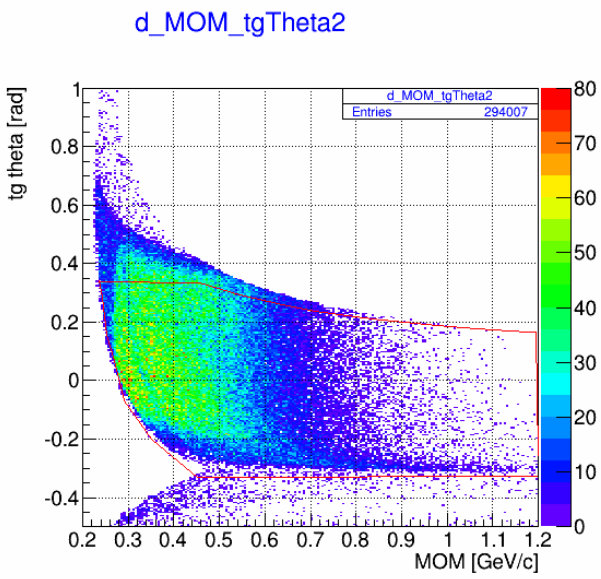
Simulation data in XZ plane. The line connecting the sample set of tracking.

Let the target at (x,z) = (0,0)
We clearly know the location of the Collimator (first bold black line)
at z = 1.095 m and x = [-0.3475, 0.3475] m

The front of the active area and the active distance can be adjust.
In this case we set it at exactly the same as the coil of the Magnetic
at z = 1.4485 m. with The active distance from front to back (horizontally) is 0.71 m.
(or at 1.4035 m with active distance = 0.8m)

The location of MWDC1, MWDC2, and TP are known.
All at angle 25 deg (or 25.5 deg from survey)
MWDC1 center at (x,z) = (-0.4199, 2.4587) m
MWDC2 is 0.757 m from MWDC1
TP is 0.973 from MWDC1

Confine data from simulation	Data with overlay of the expected polygon cut
hist_passMagDet_theta_det_x_det 	hist_theta_det_x_det 
hist_passMagDet_theta_tg_det 	hist_theta_det_theta_tg 

Confine data from simulation	Data with overlay of the expected polygon cut
	

Comparing the simulation to data, we have some mis-match in the reconstruction at the target.

From elastic, it is clear that what expect from q are different from the reconstruction both theta and |p|.