Progres of Task 3 : Estimation of secondary particles contribution in the yields of (anti)protons and deuterons

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Objetives

- Born in A+A collision primary particles interact inside MPD detector material producing secondaries.
- Some of them can be rejected by track selection criteria, some – cannot!
- One must estimate contribution of secondaries in selected samples of (anti)protons and deuterons.

With DCA

```
66      // DCA: Distance of Closest Approach perpendicular and along Z axis
67      float GetDCAX() const { return fDCAX; }
68      float GetDCAY() const { return fDCAY; }
69      float GetDCAZ() const { return fDCAZ; }
```

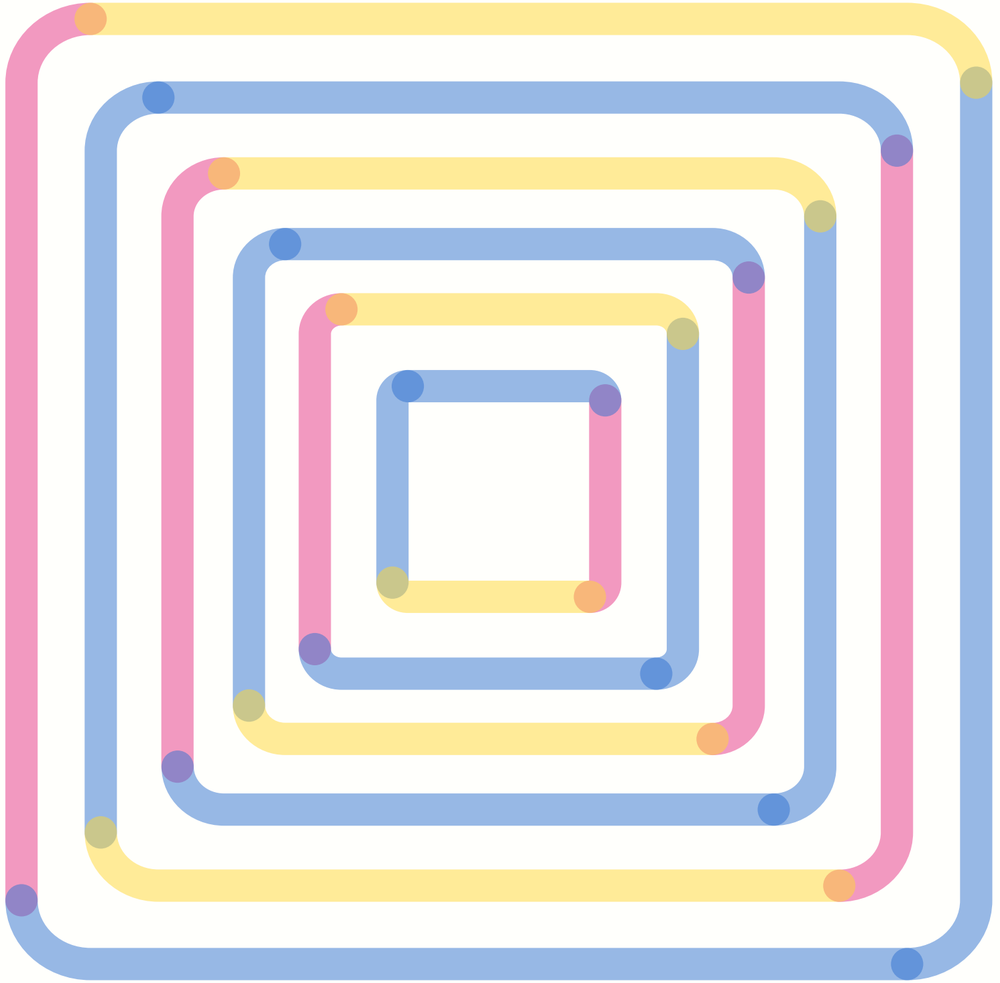
I make the histogrmas with DCA, & I used this datas.
Where DCA : Distance of Closest Approach perpendicular and along Z axis

Data with the generator PHQMD, the Hipernucleos data in the request Bi+Bi Sqrt(s)=9.2AGeV
100,000 events

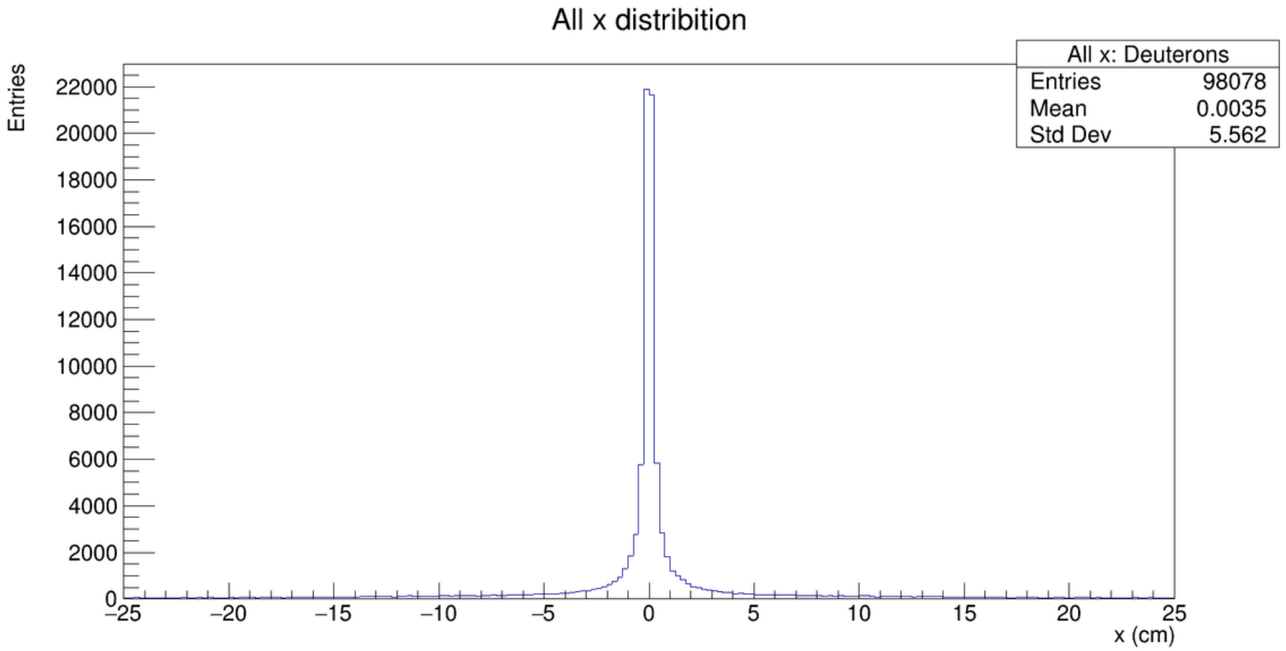
Data with the generator BOX
100,000 events

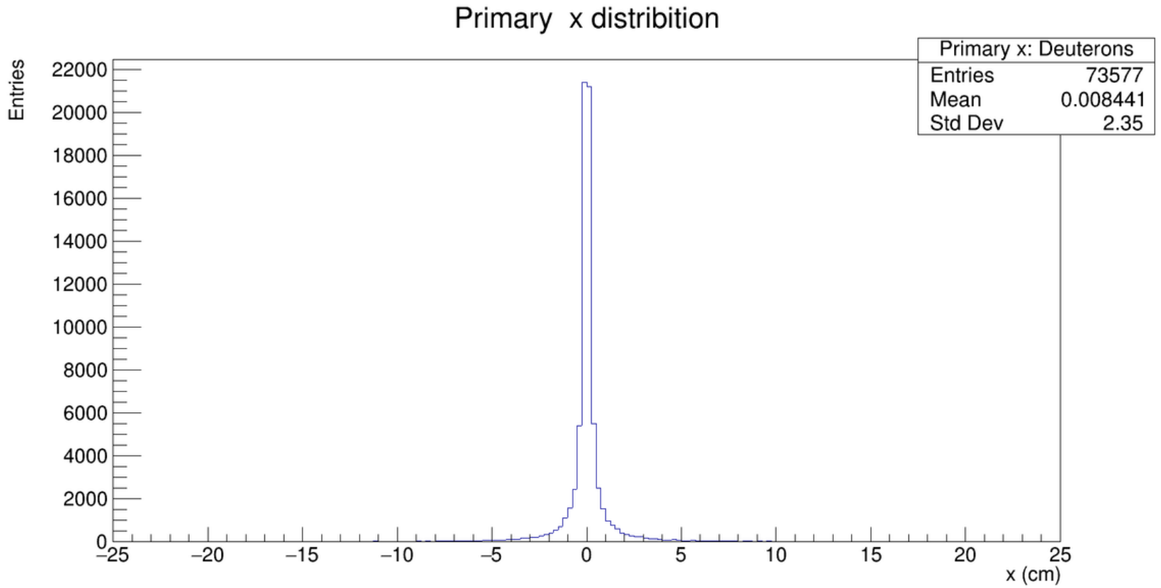
Data with the generator PHQMD, the Hipernucleos data in the request Bi+Bi Sqrt(s)=9.2AGeV

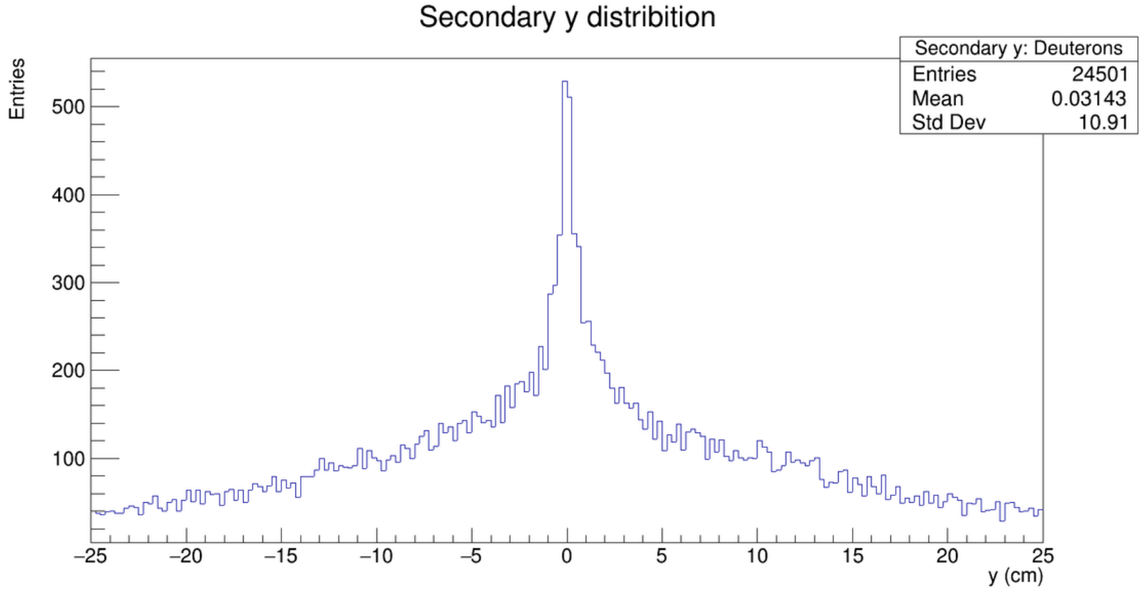
100,000 events



Deuterons on the axis-x while function of DCAX



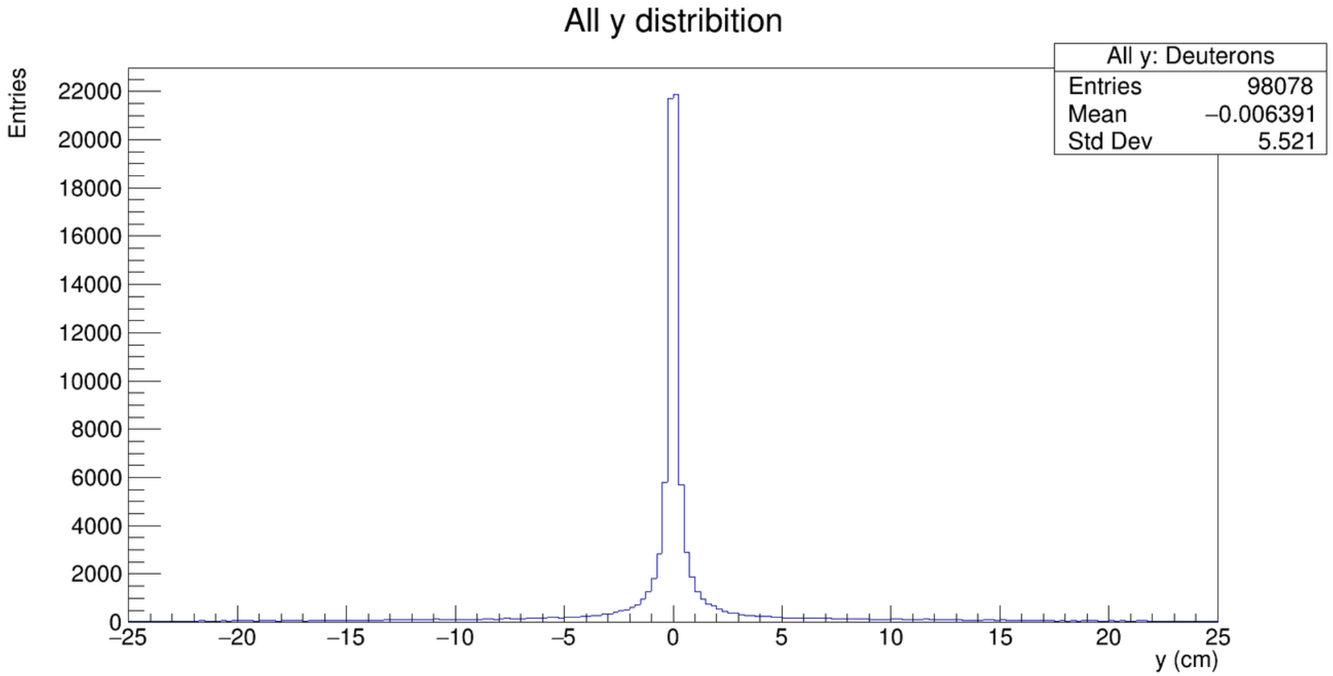


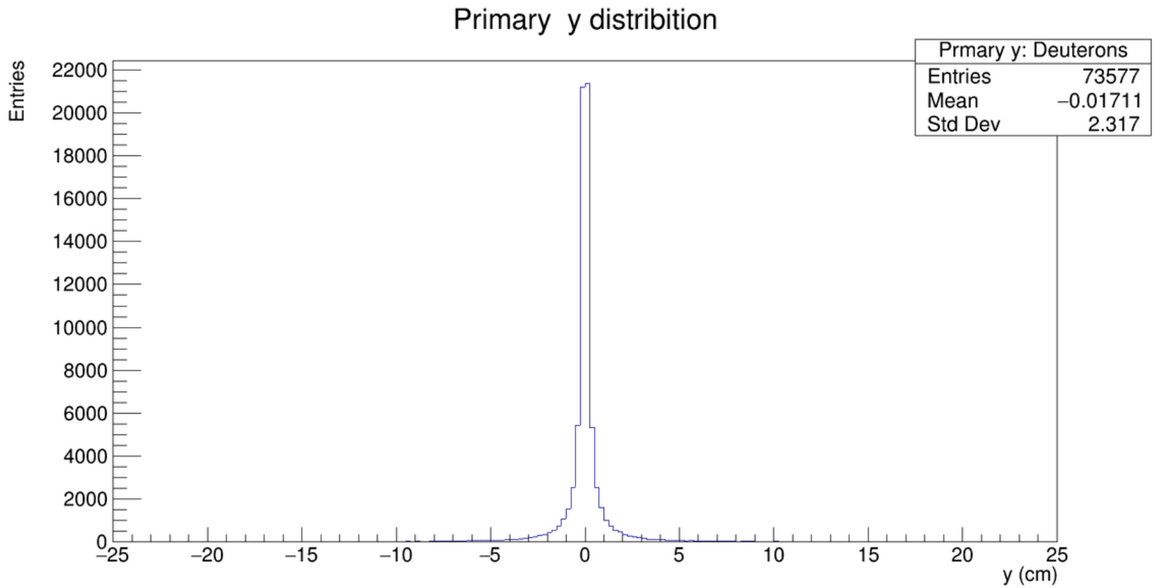


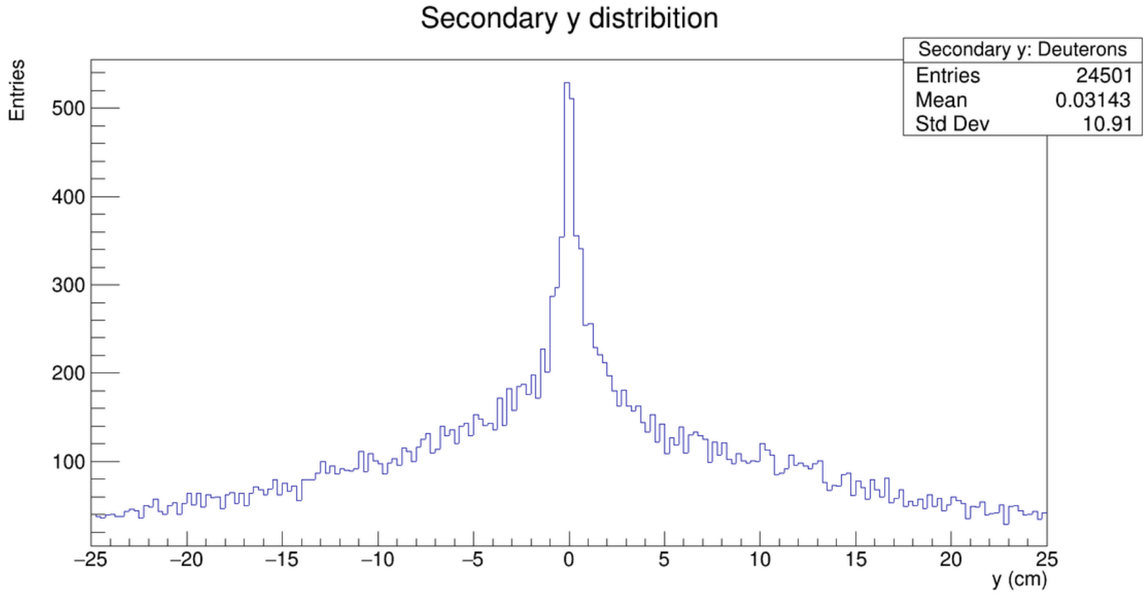
Percentage Deuterons

All	100__%	98 078
Primary	75.02__%	73 577
Secondary	24.98__%	24 501

Deuterons on the axis-y while function of DCAY







Percentage Deuterons

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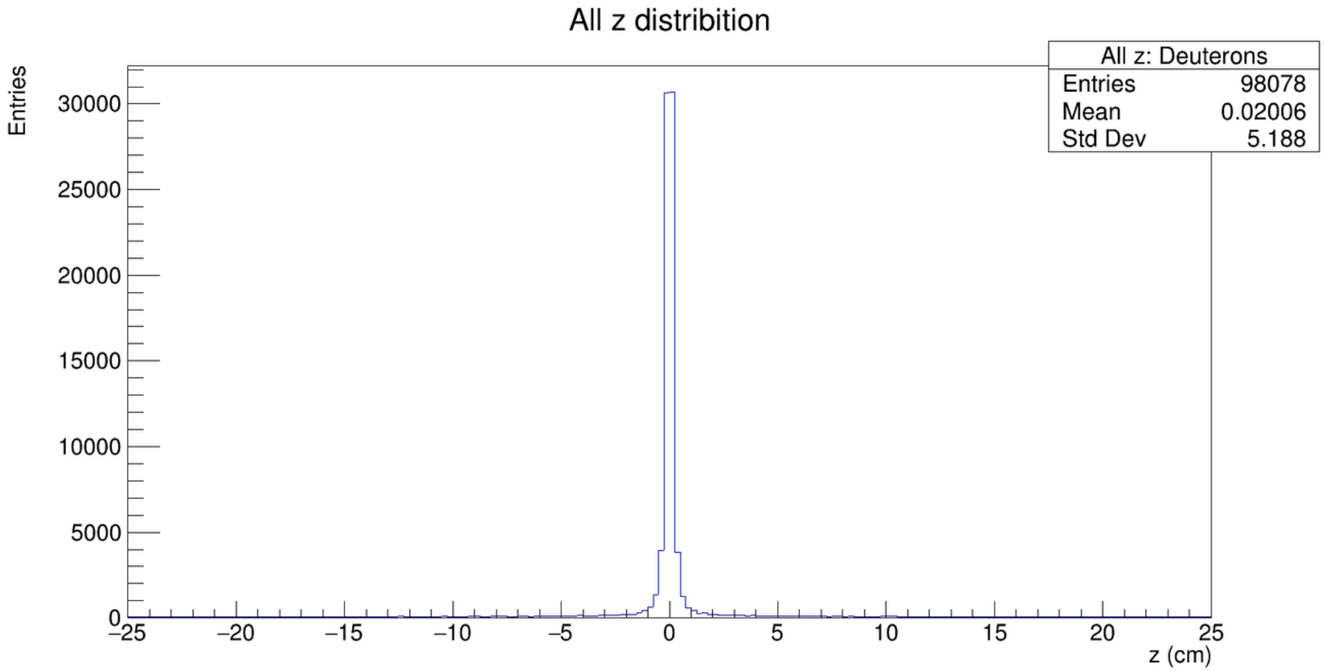
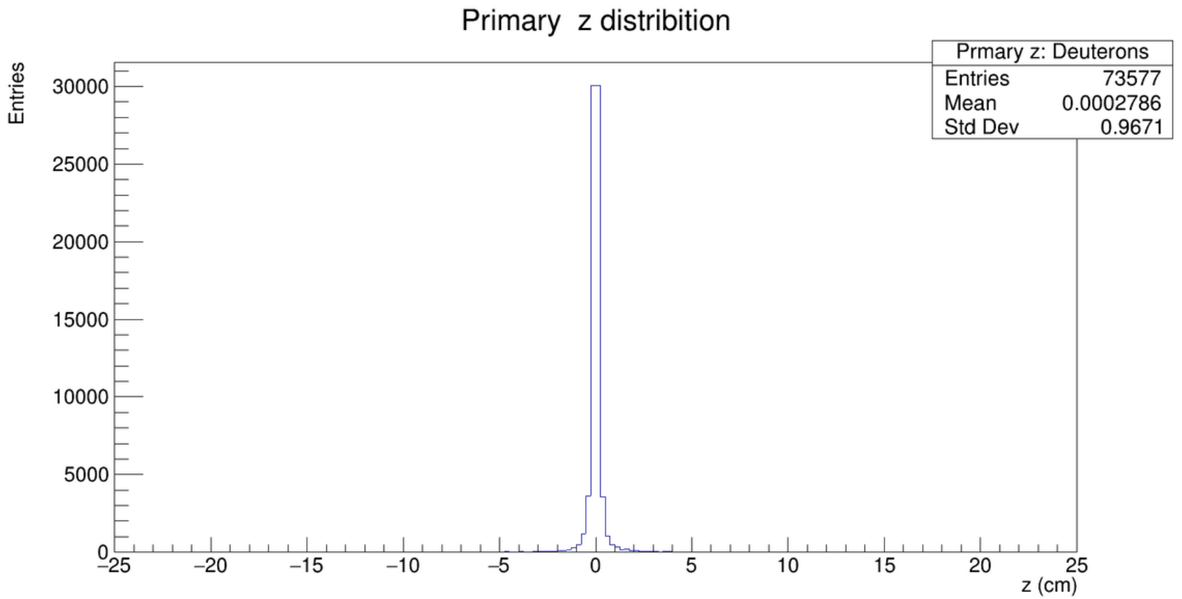
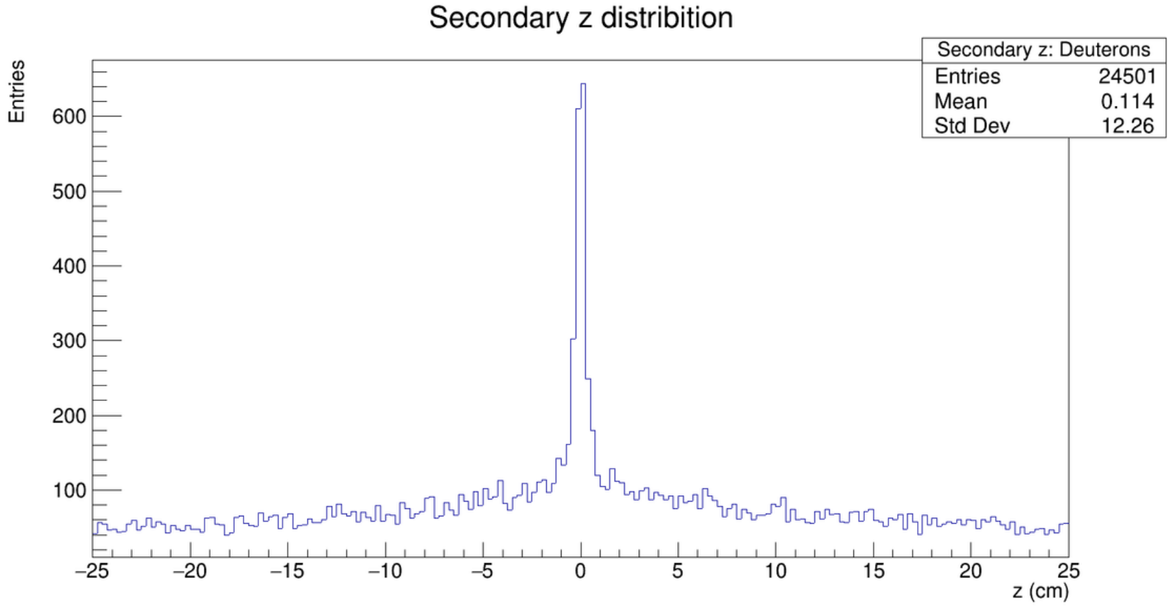
Deuterons on the axis-z while function of DCAZ







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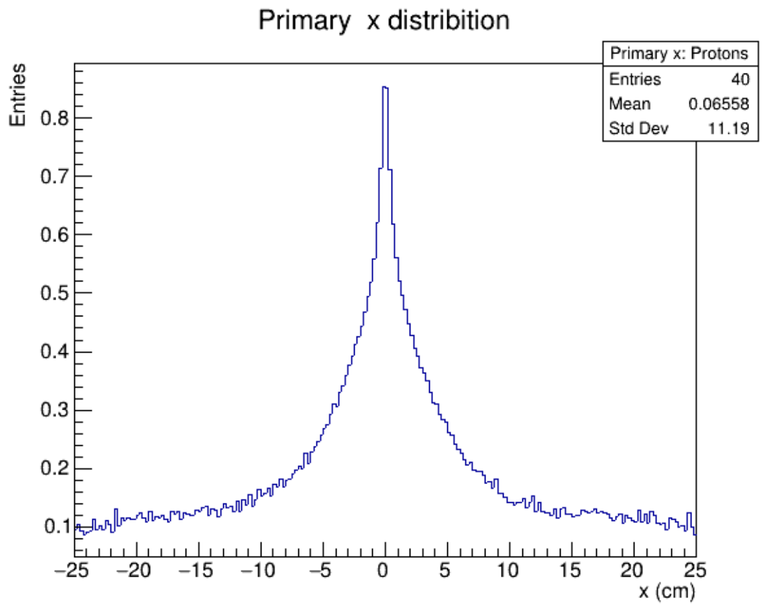
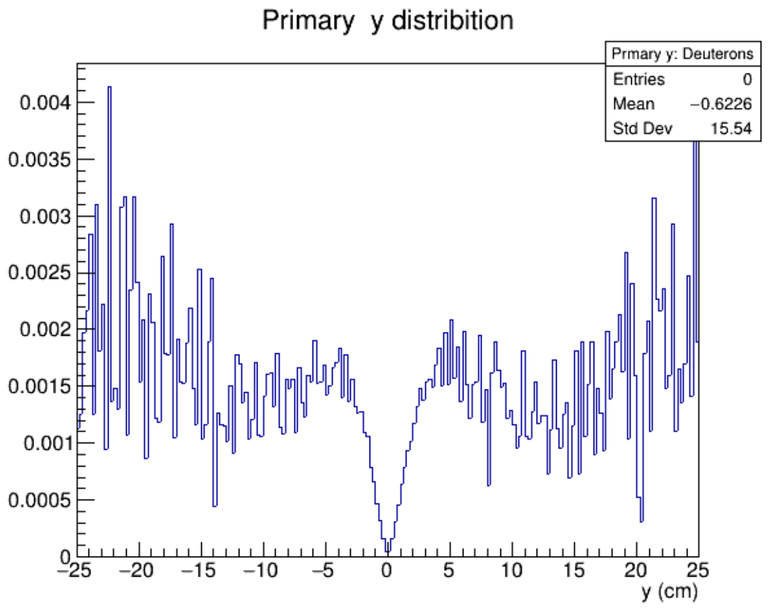
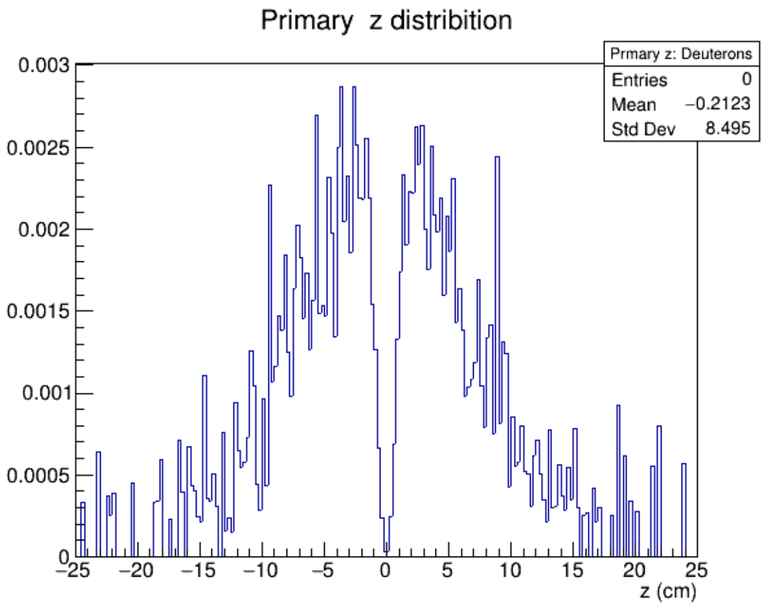
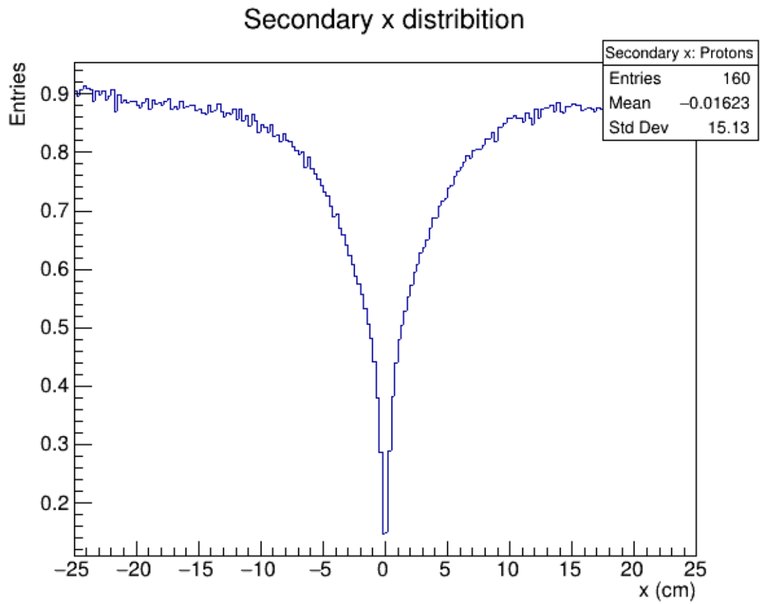
Ratios of primary particles between all particles on the three directions

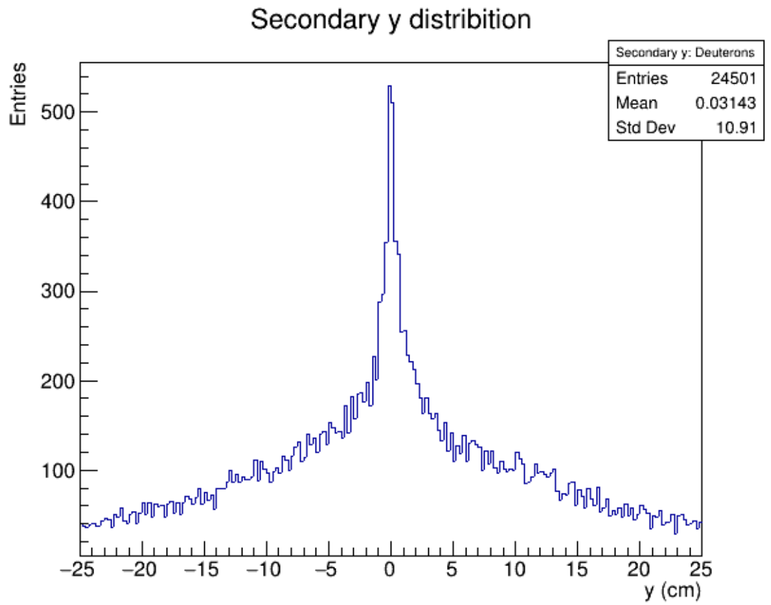


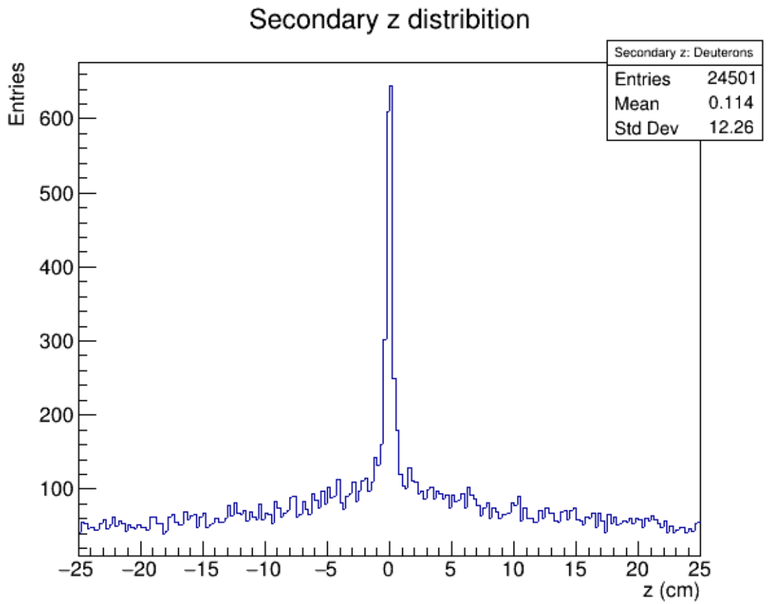




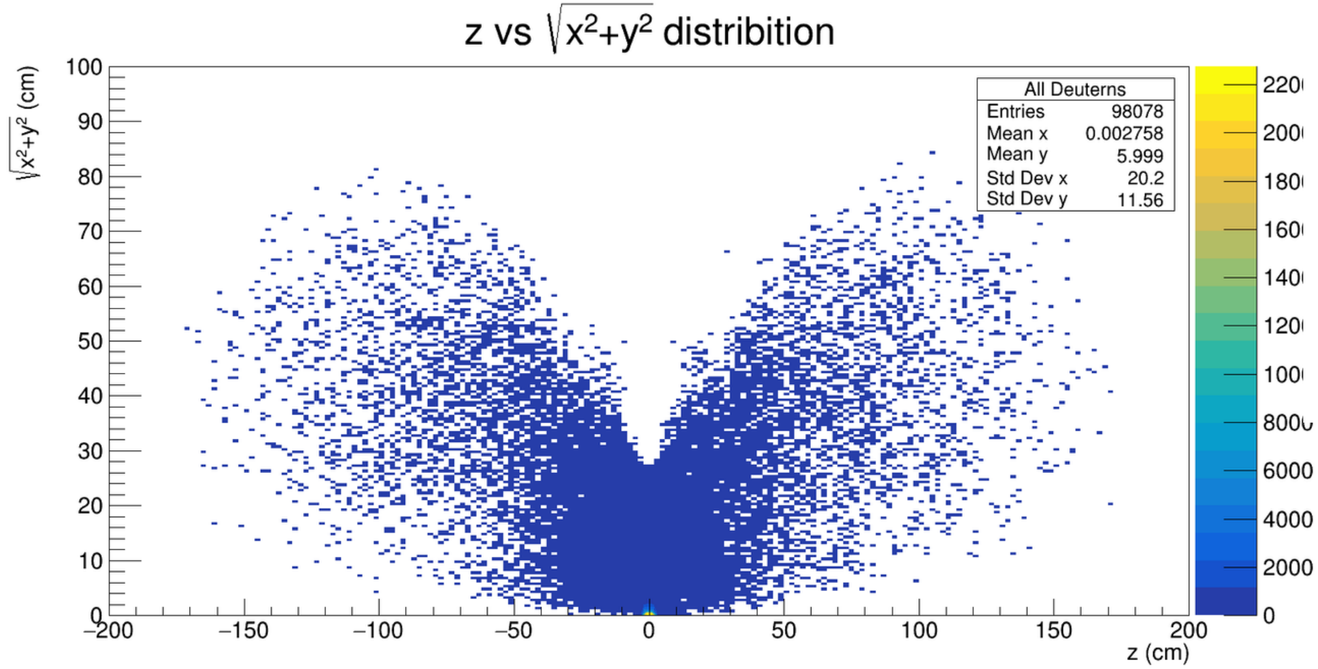
Ratios of secondary particles between all particles on the three directions

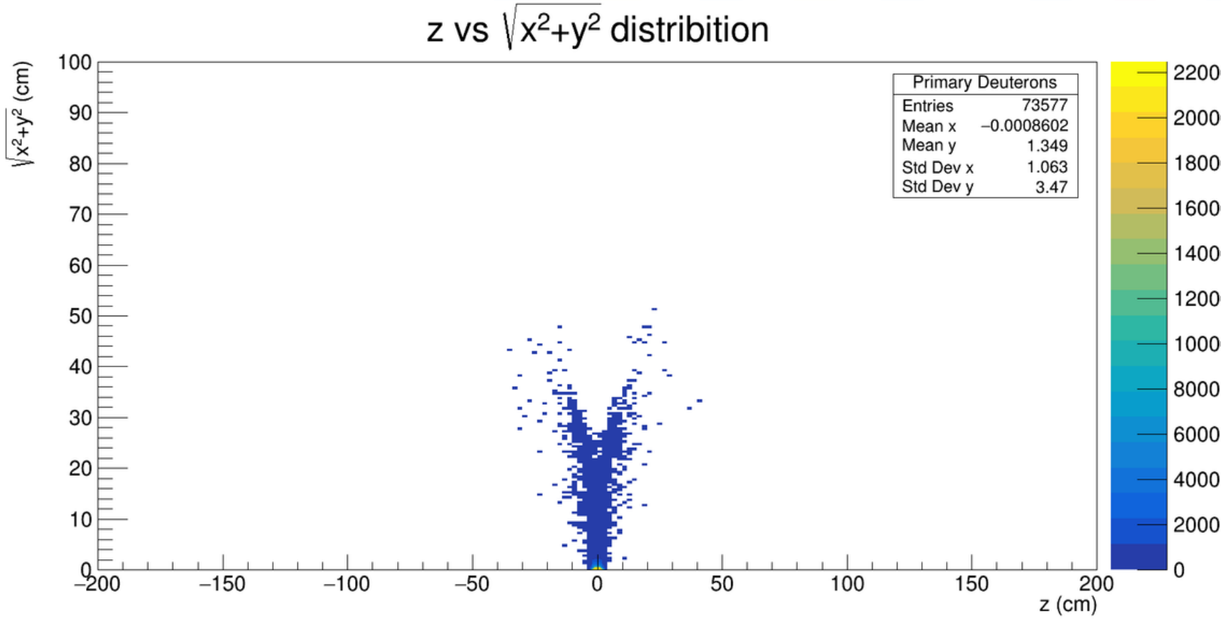


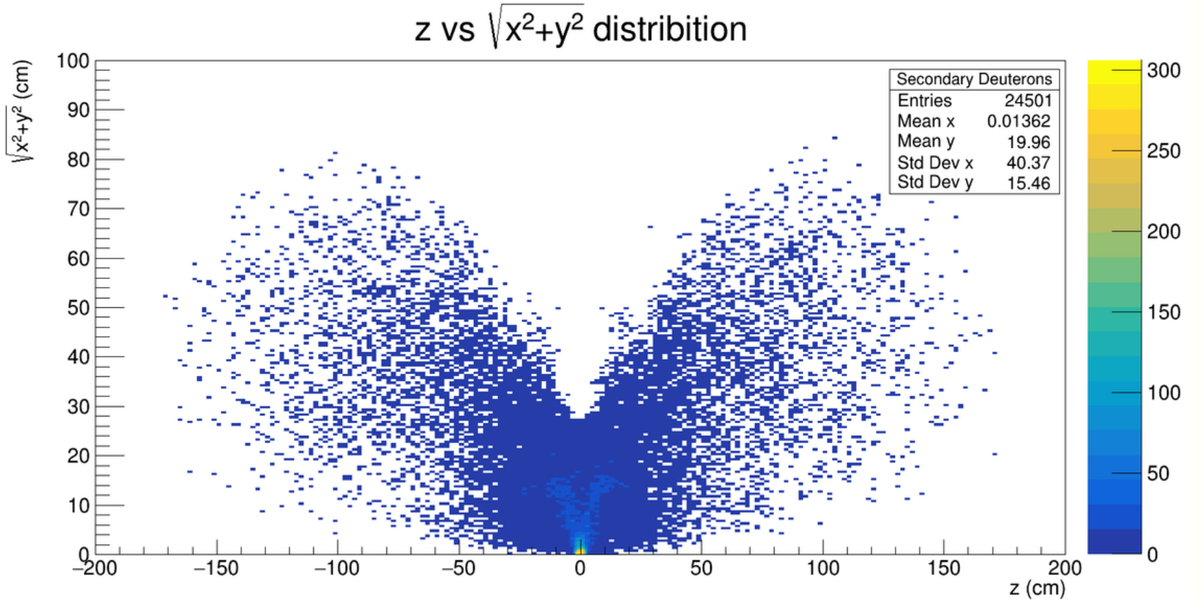




Distribution of Deuterons en z vs radius while function of DCA







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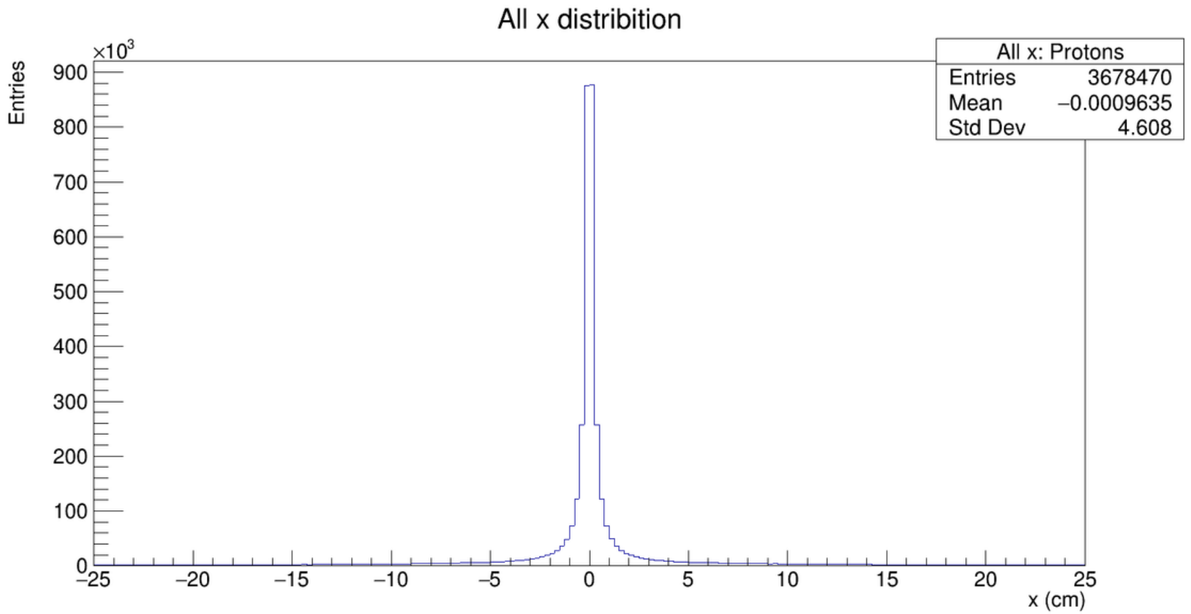
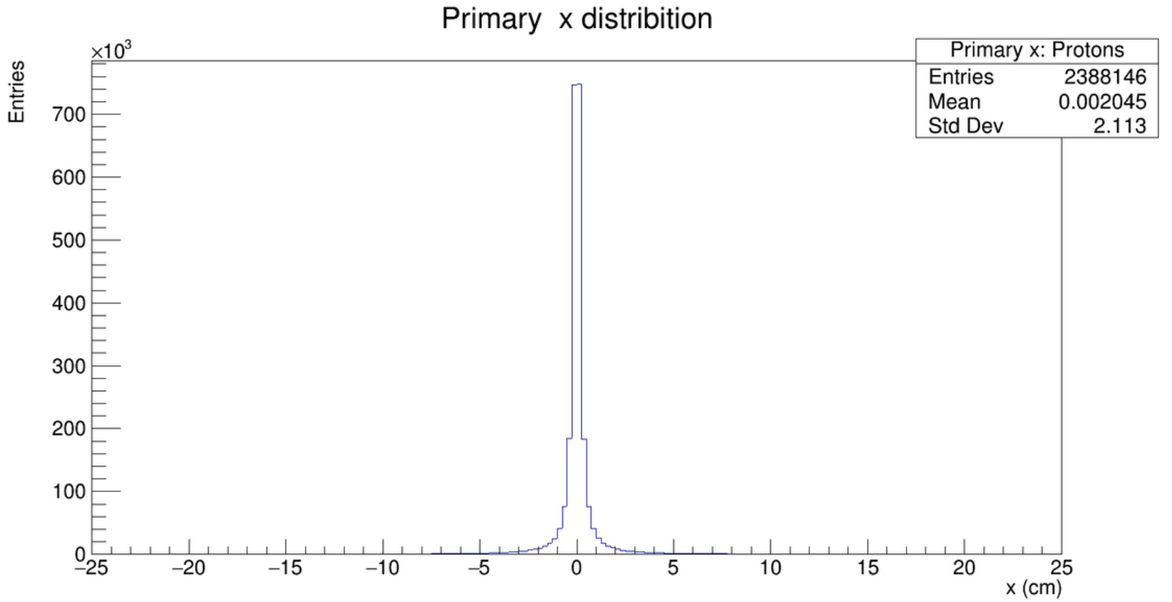
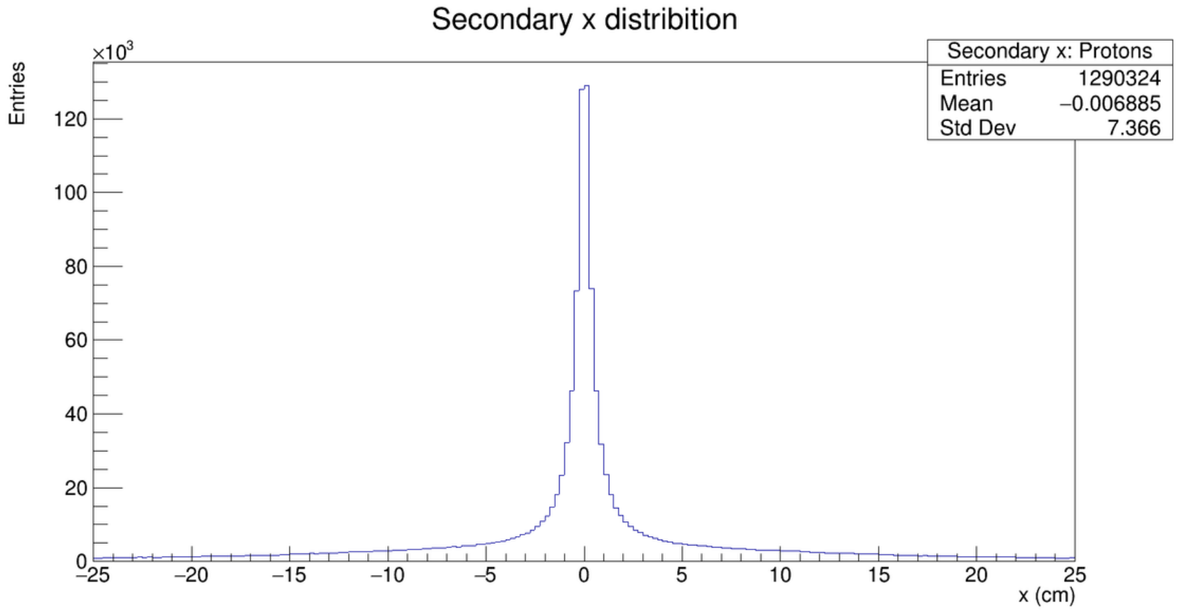
Protons on the axis-x while function of DCAX



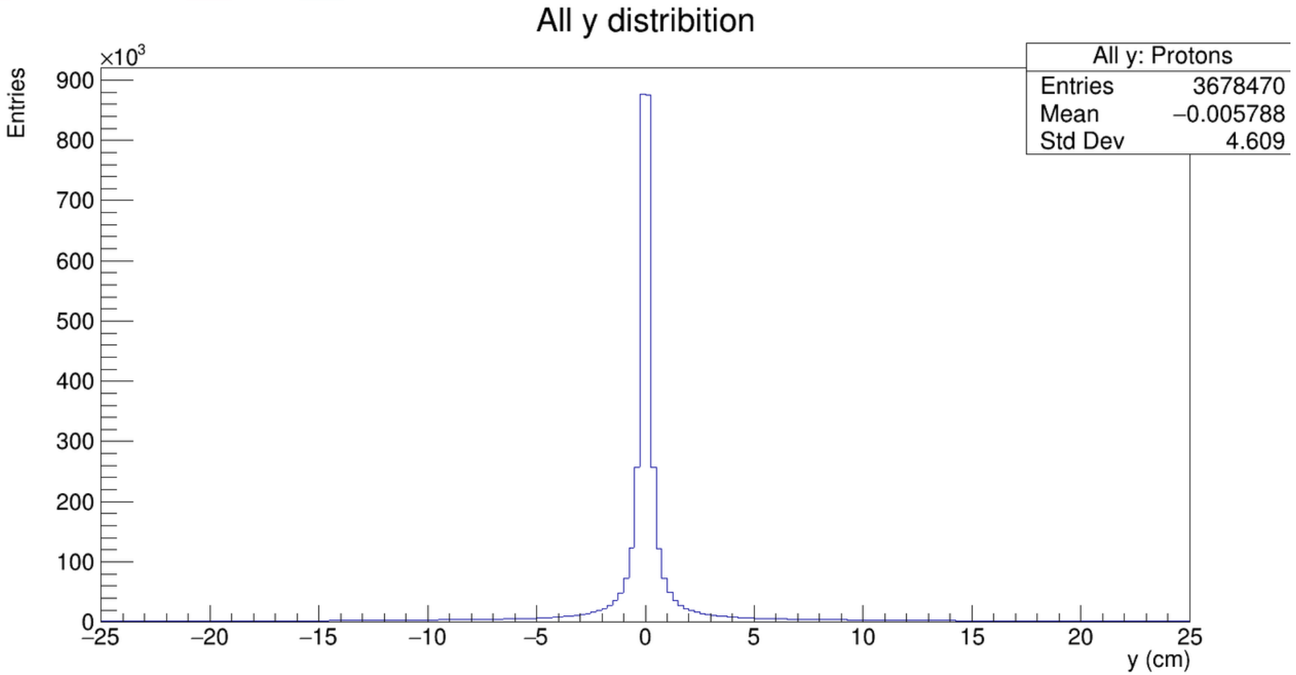


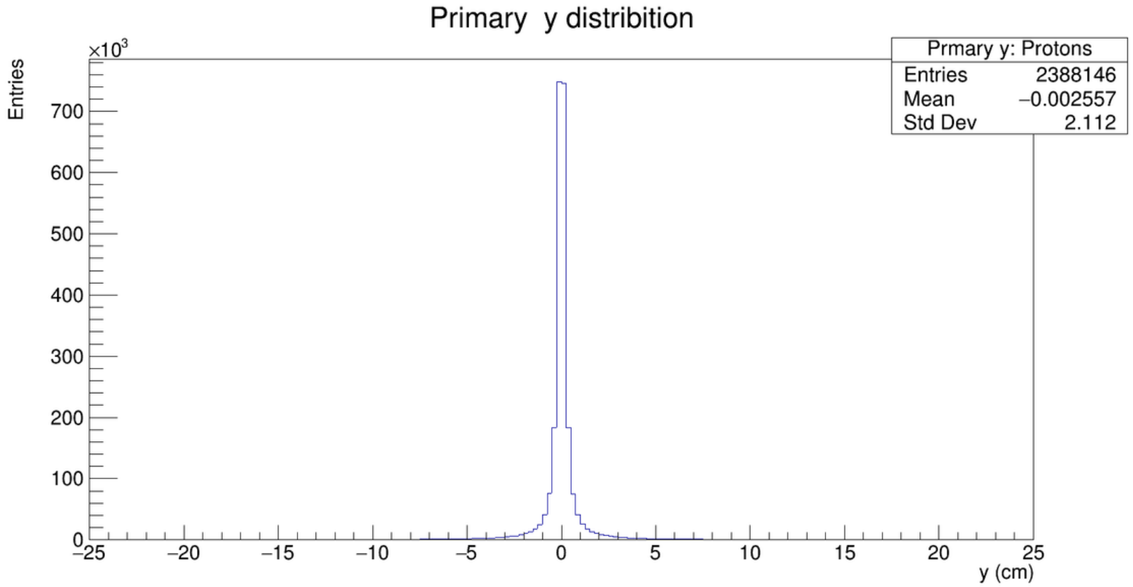


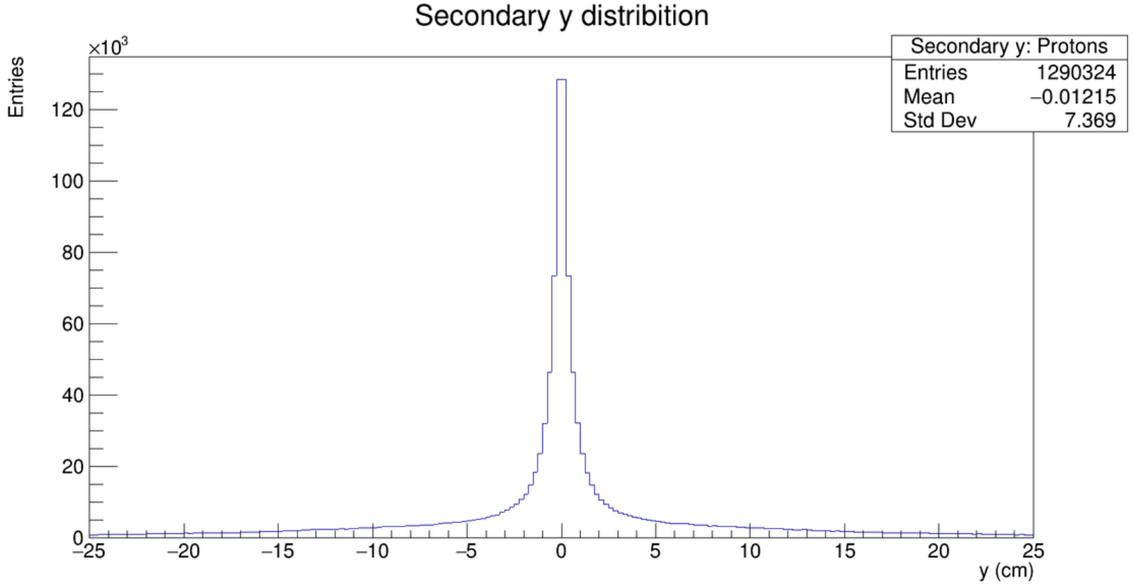
Percentage Deuterons

All	100__%	3 678 470
Primary	64.92__%	2 388 146
Secondary	35.08__%	1 290 324

Protons on the axis-y while function of DCAY







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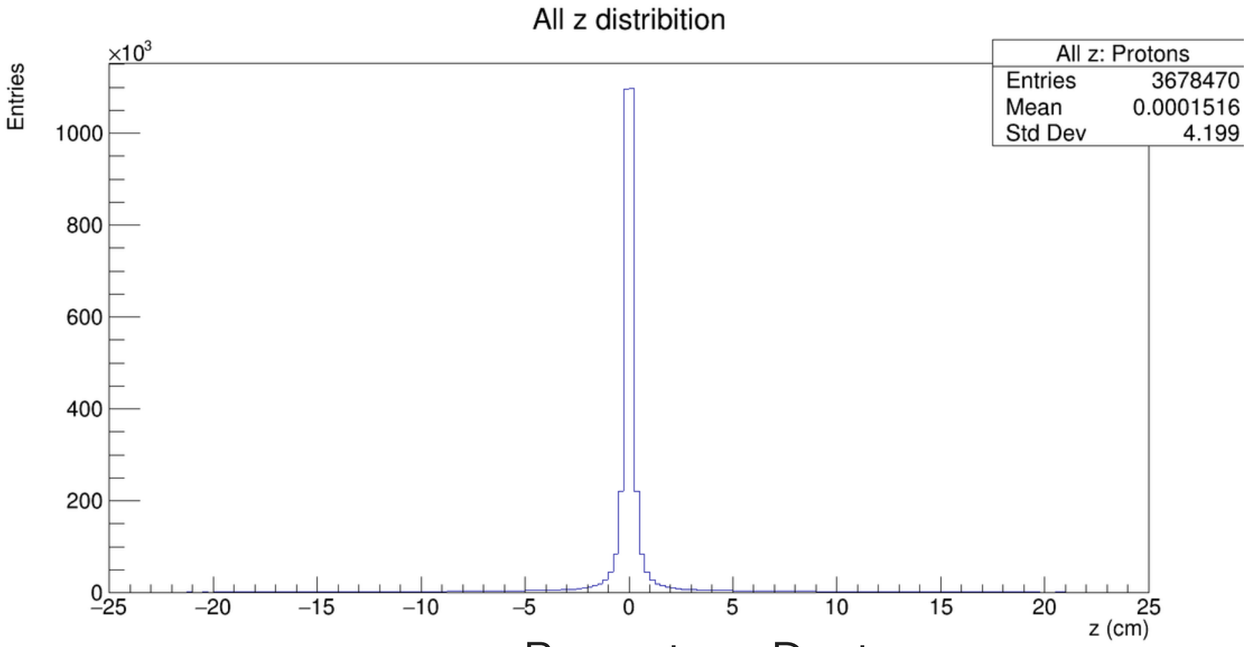
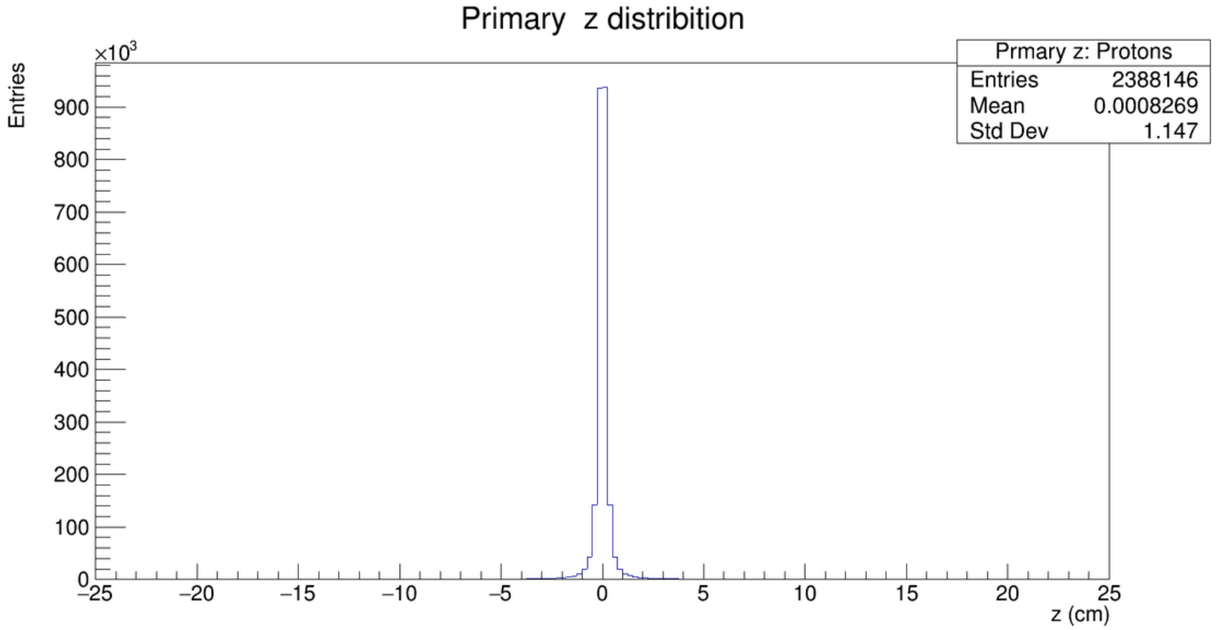
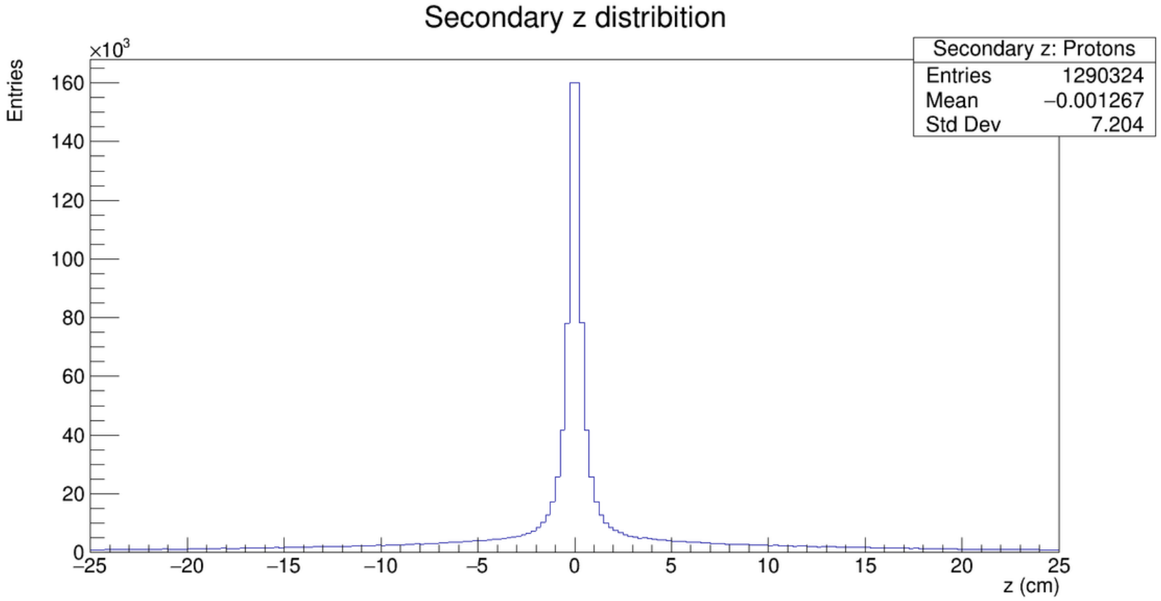
Protons on the axis-z while function of DCAZ







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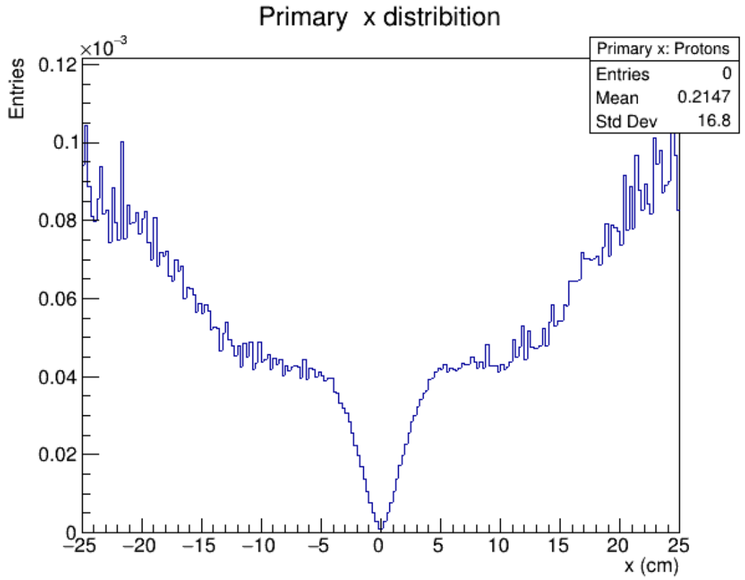
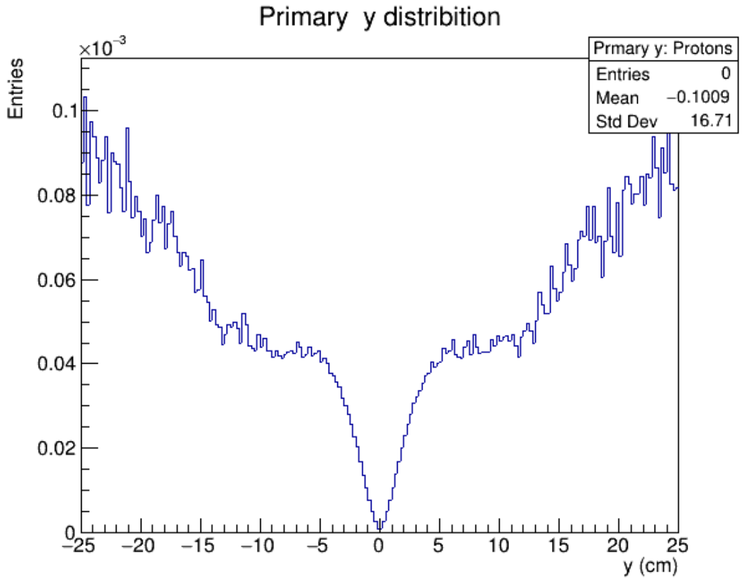
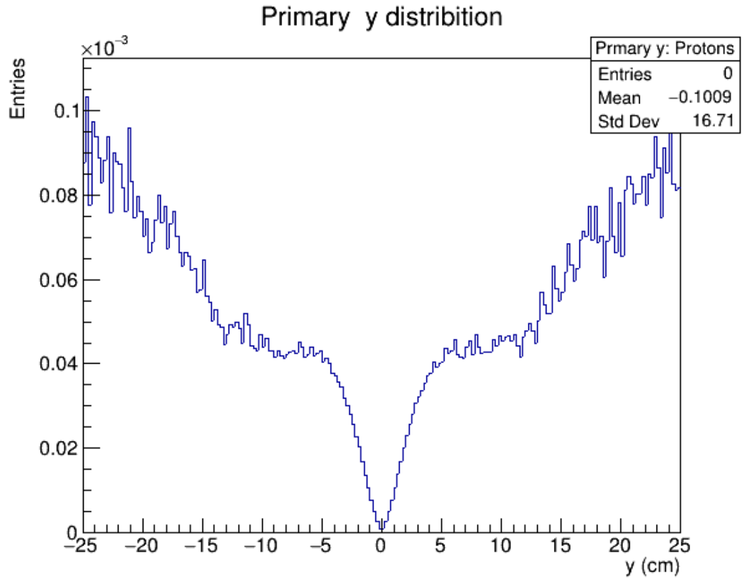
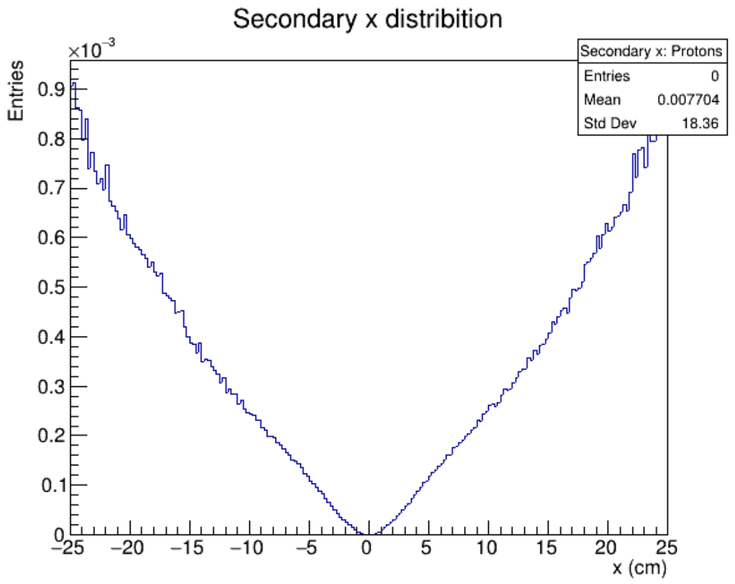
Ratios of primary particles between all particles on the three directions

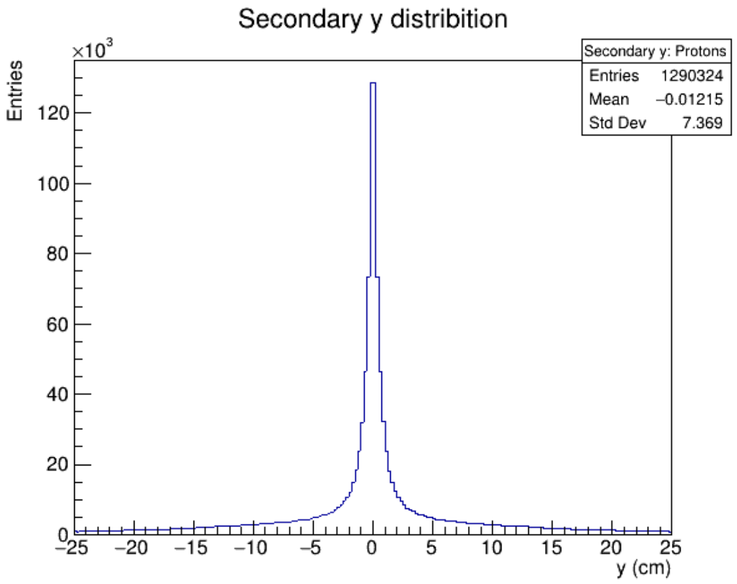


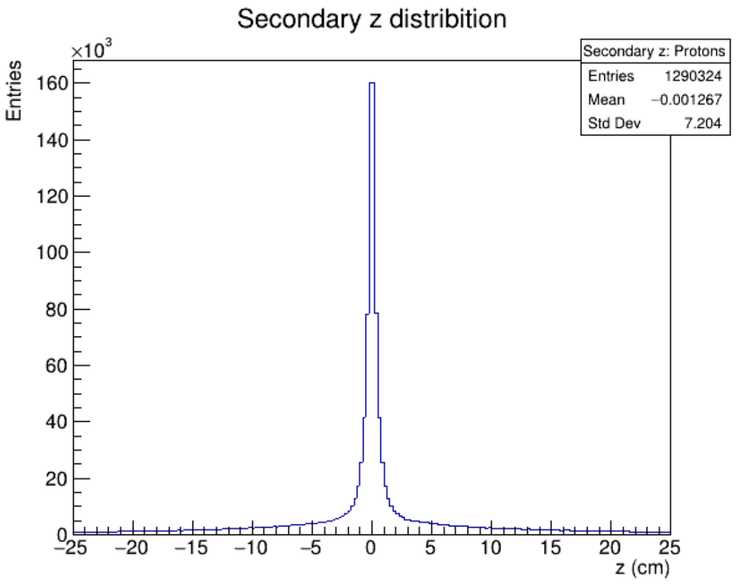




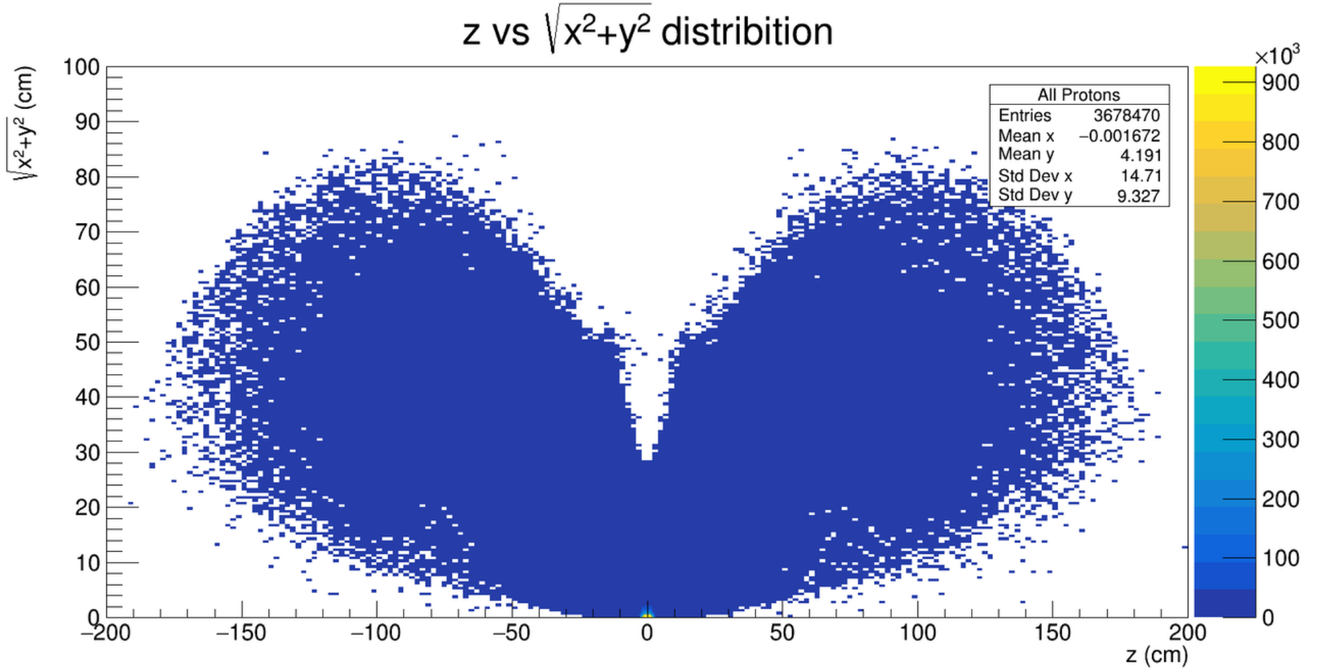
Ratios of secondary particles between all particles on the three directions

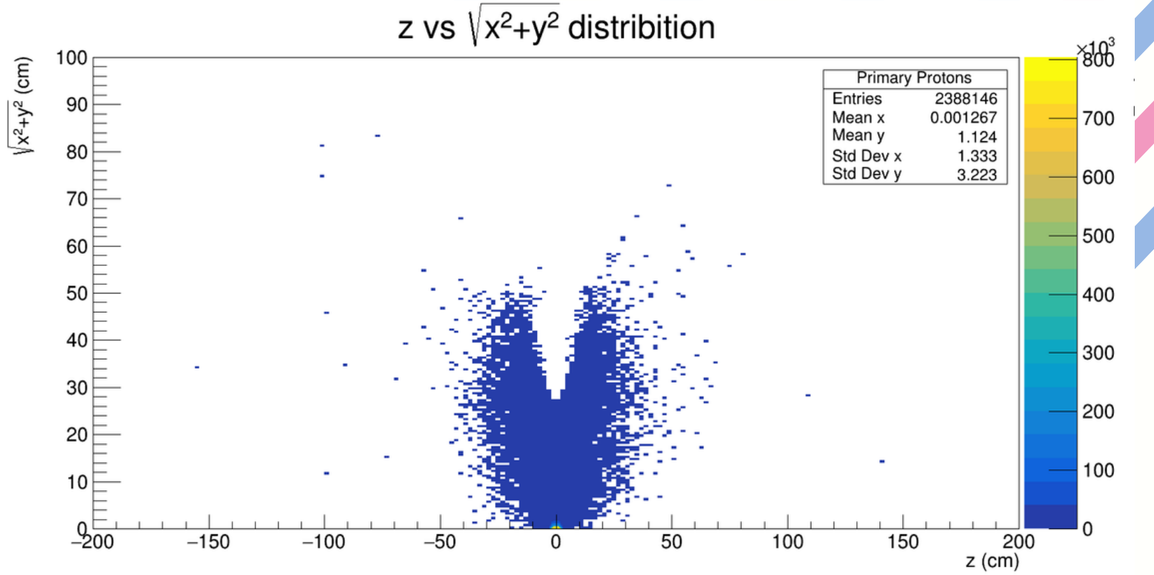


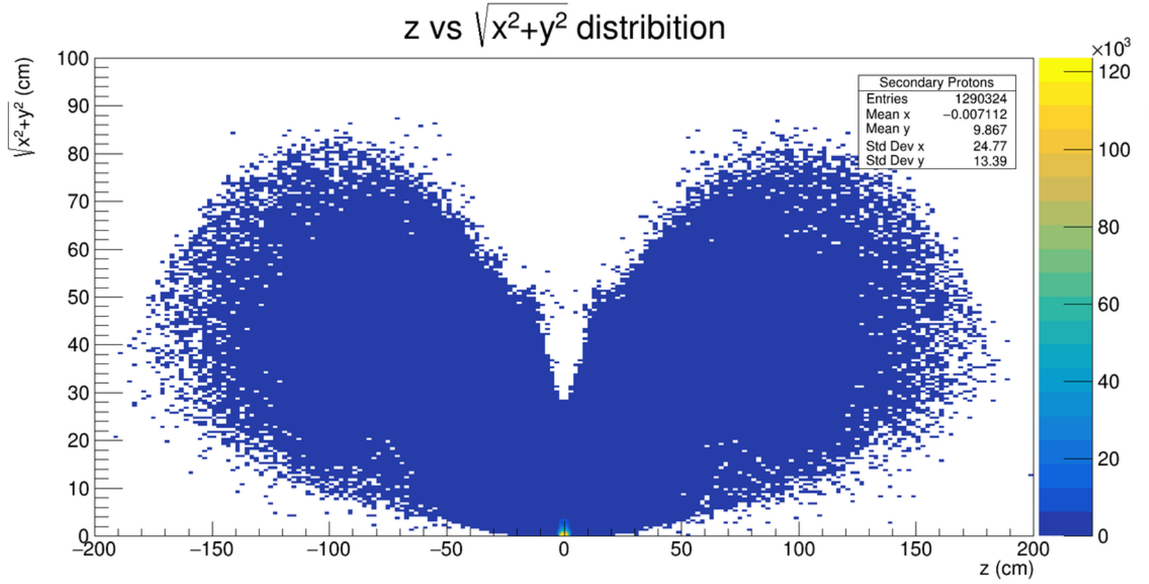




Distribution of Protons en z vs radius while function of DCA







Percentage Deuterons

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Primary	64.92__%	2 388 146
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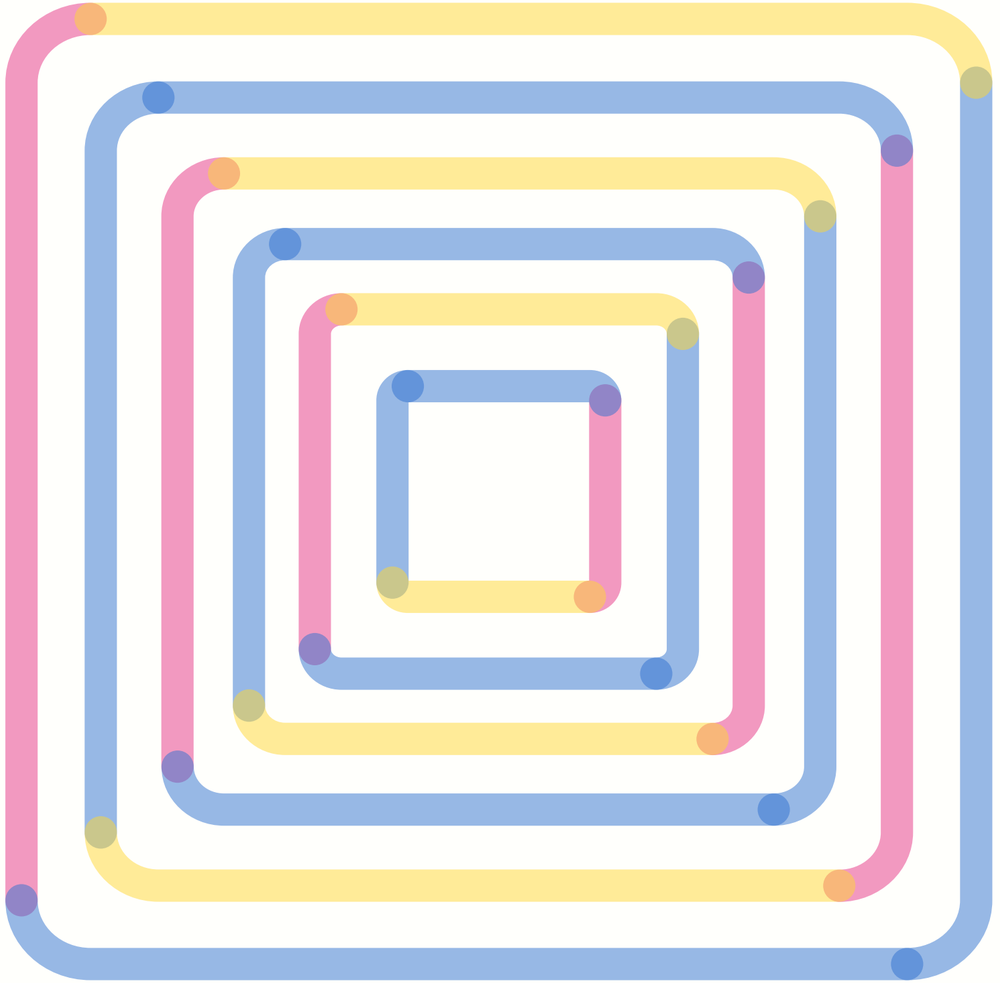
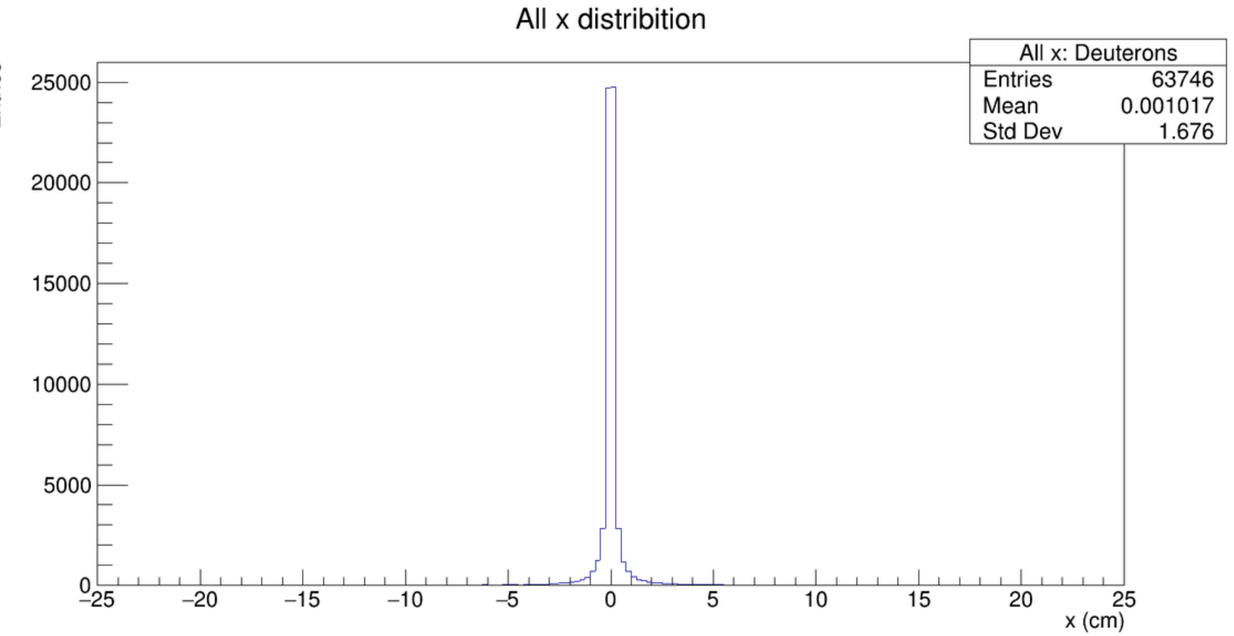
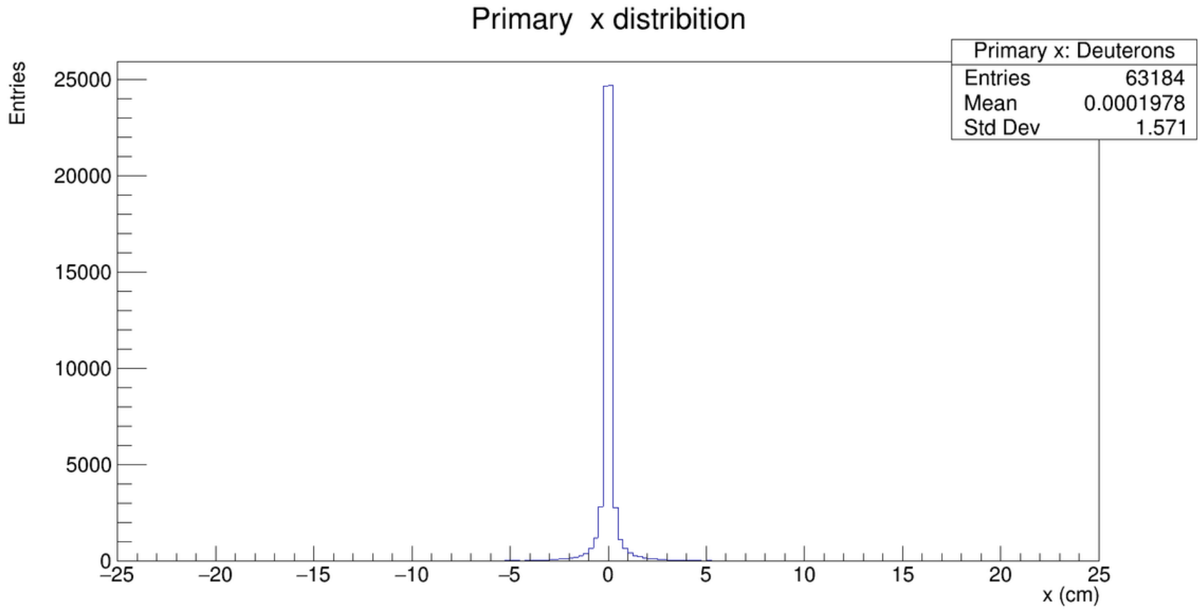
Data with the generator BOX

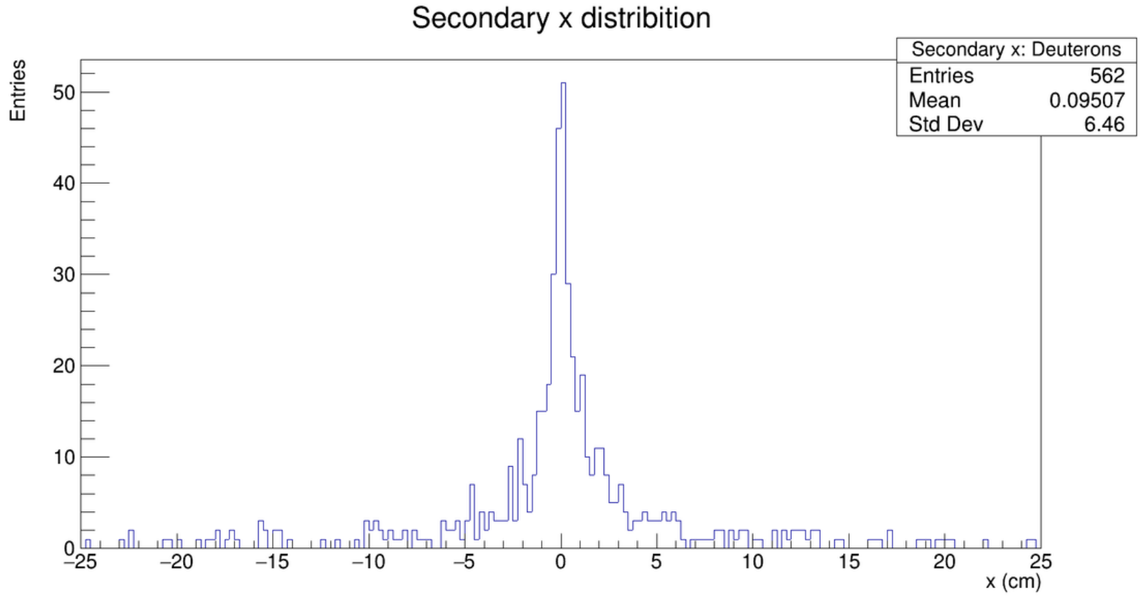
100,000 events



Deuterons on the axis-x while function of DCAX



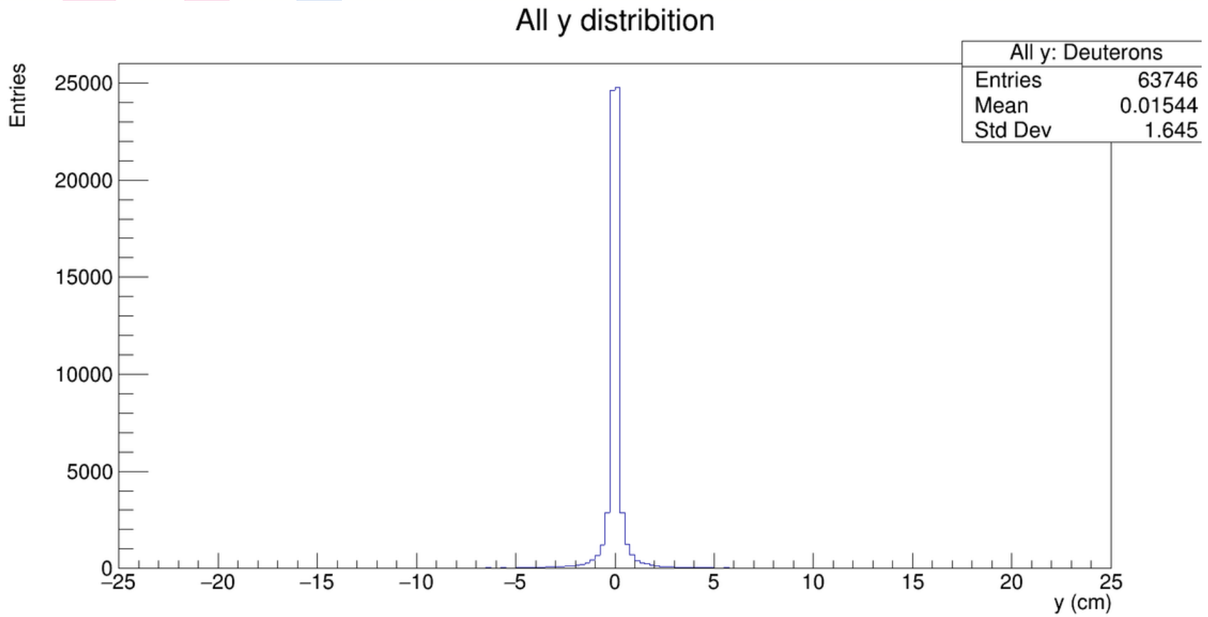


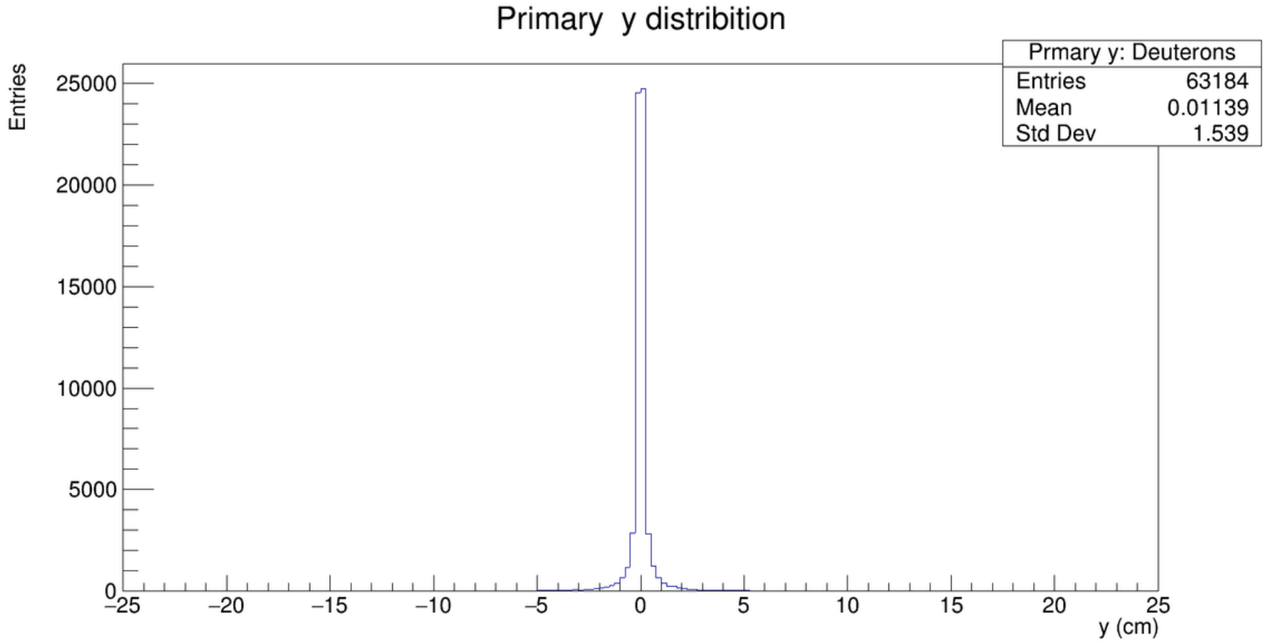


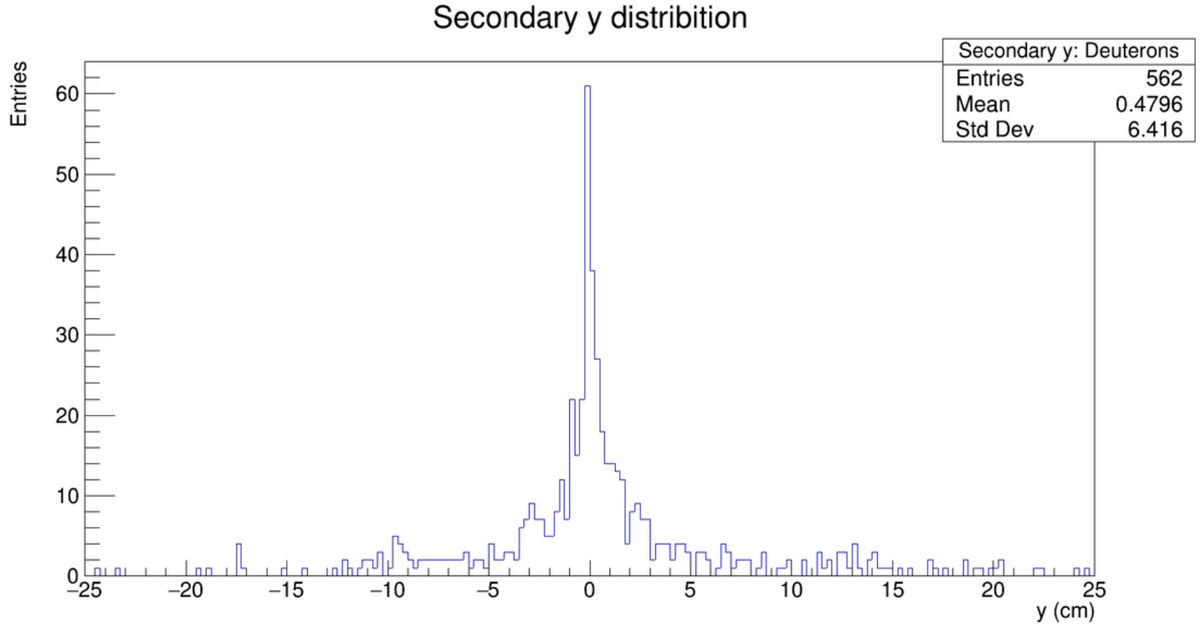
Percentage Deuterons

All	100__%	63 746
Primary	99.12__%	63 184
Secondary	0.88__%	562

Deuterons on the axis-y while function of DCAY







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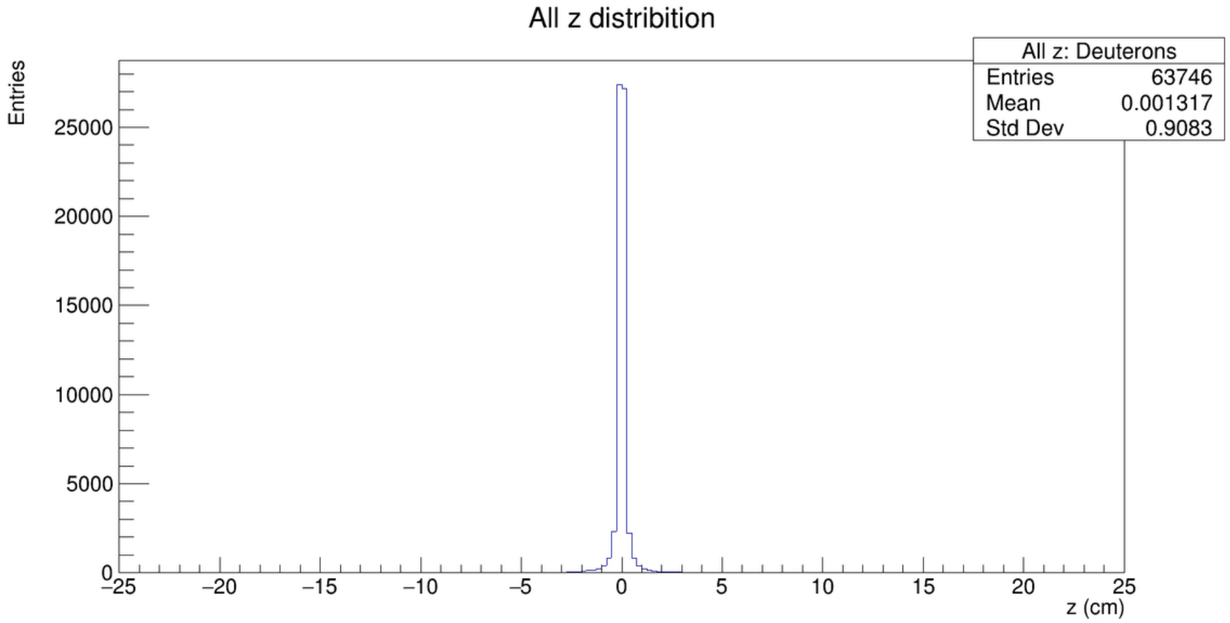
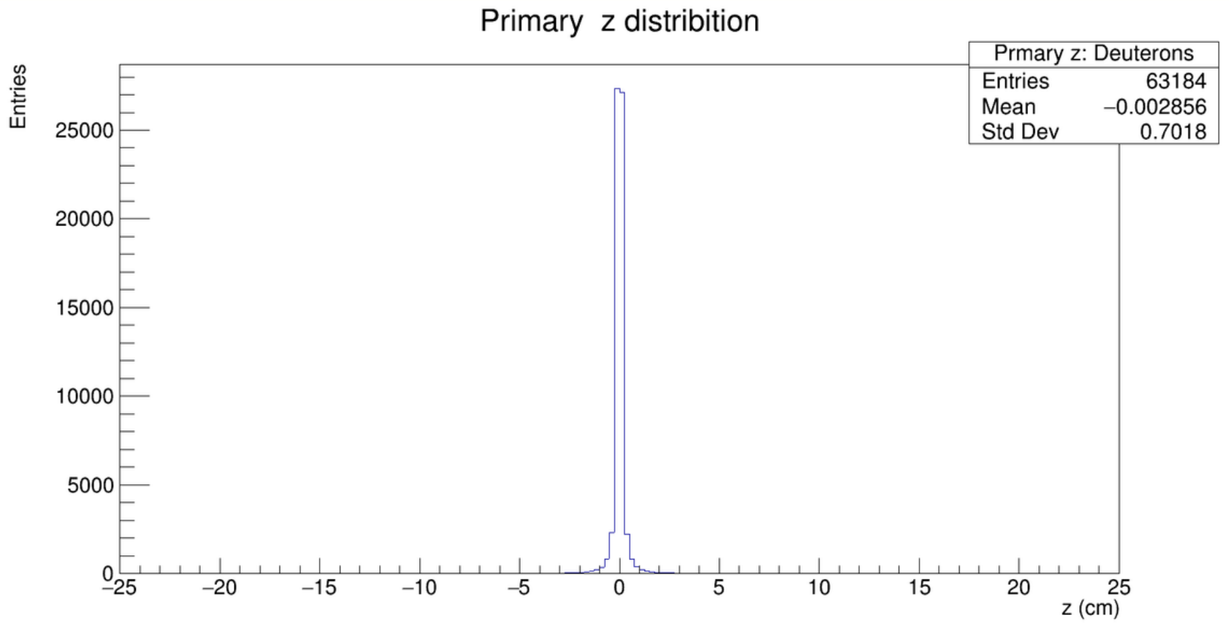
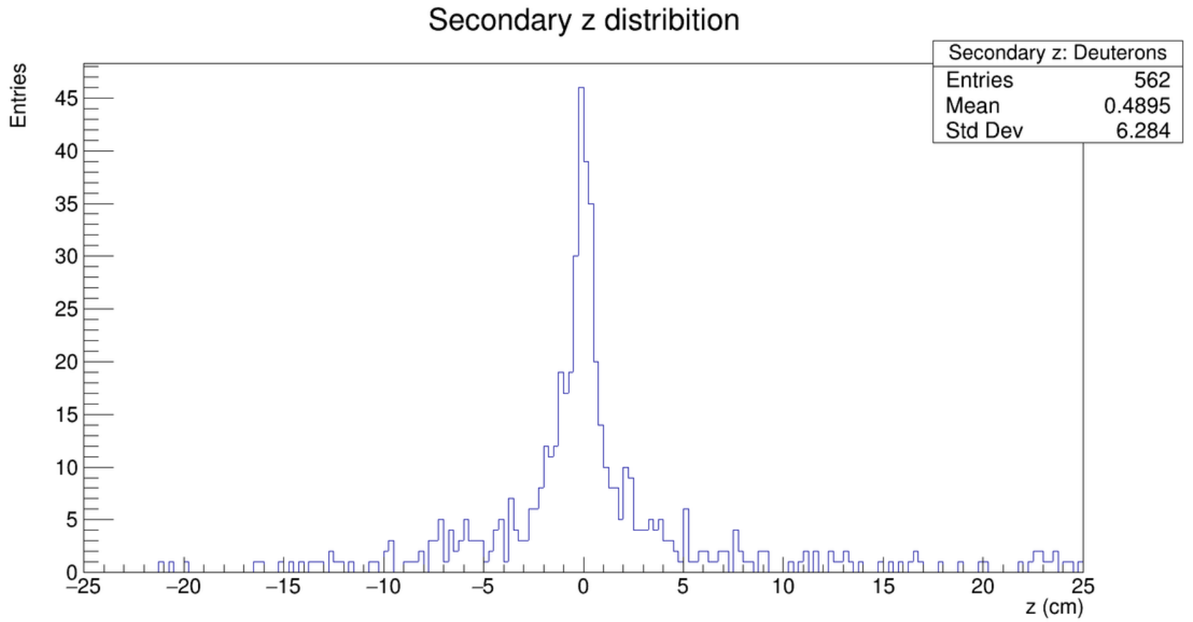
Deuterons on the axis-z while function of DCAZ







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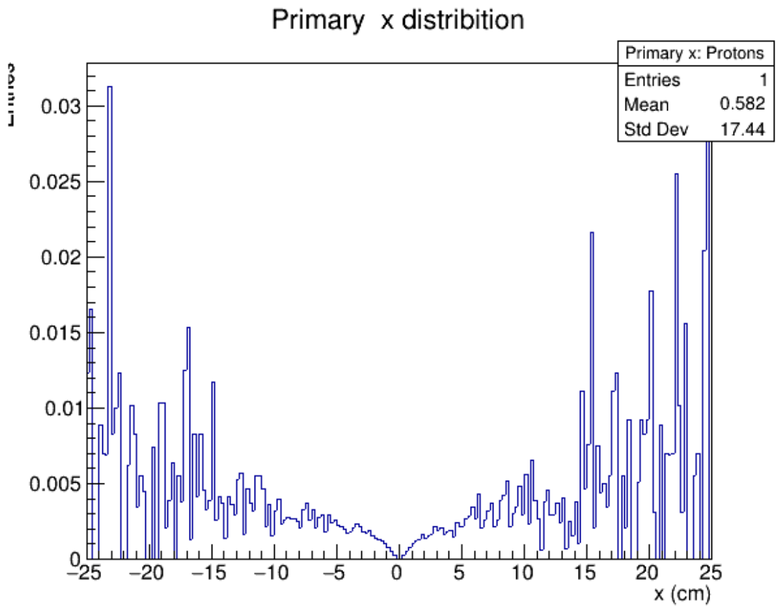
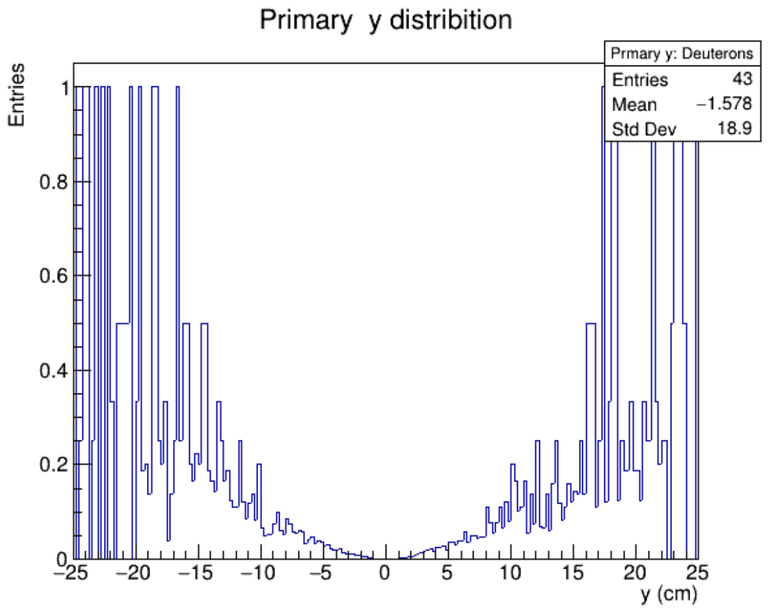
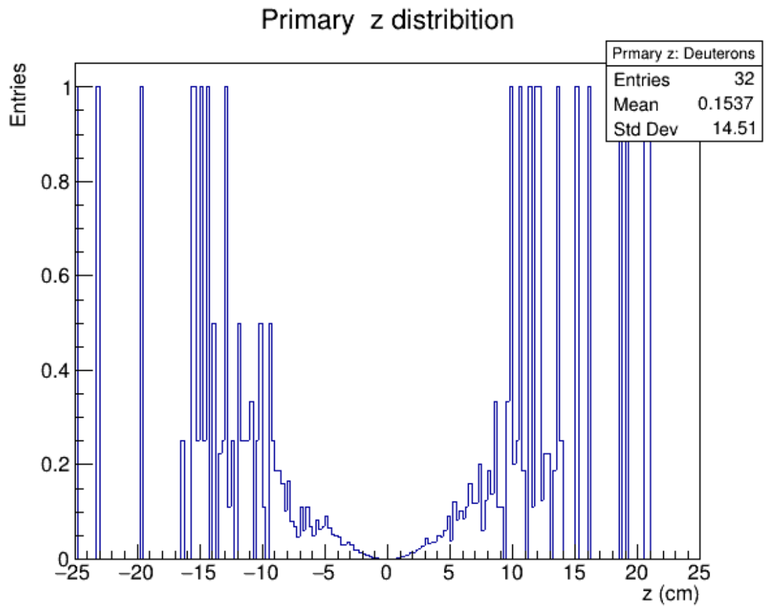
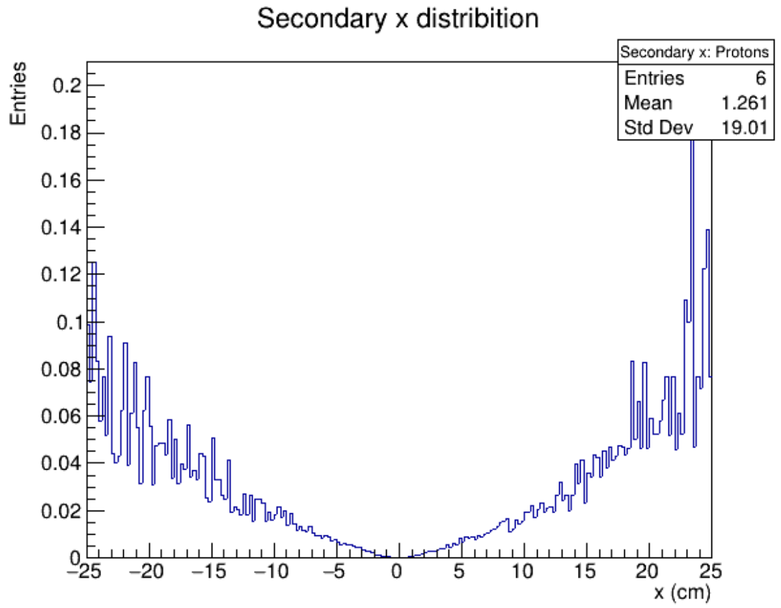
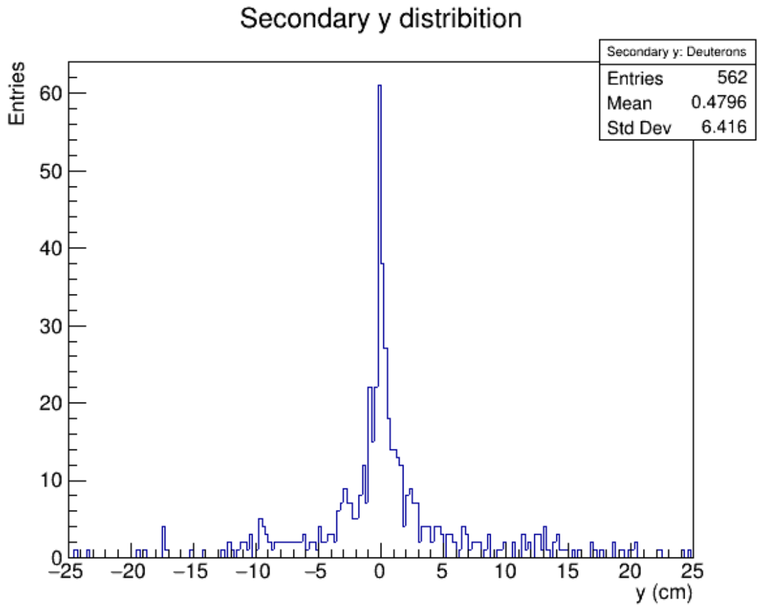


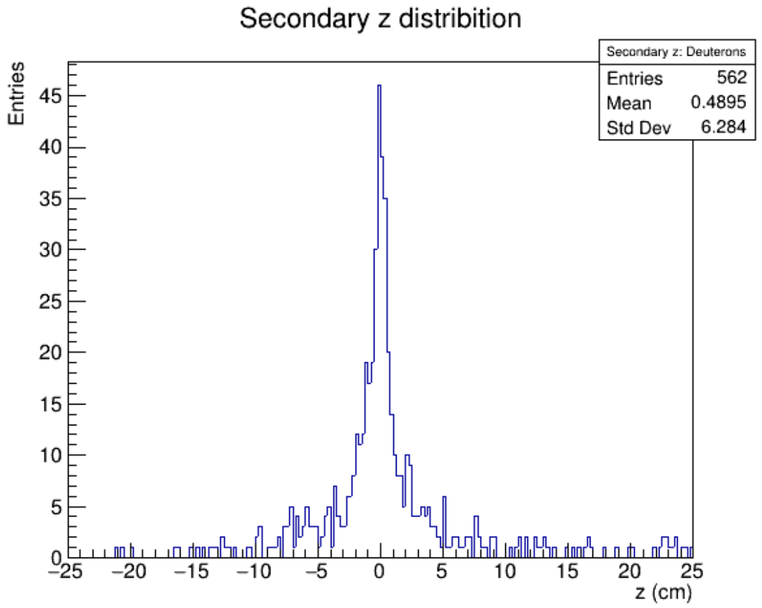




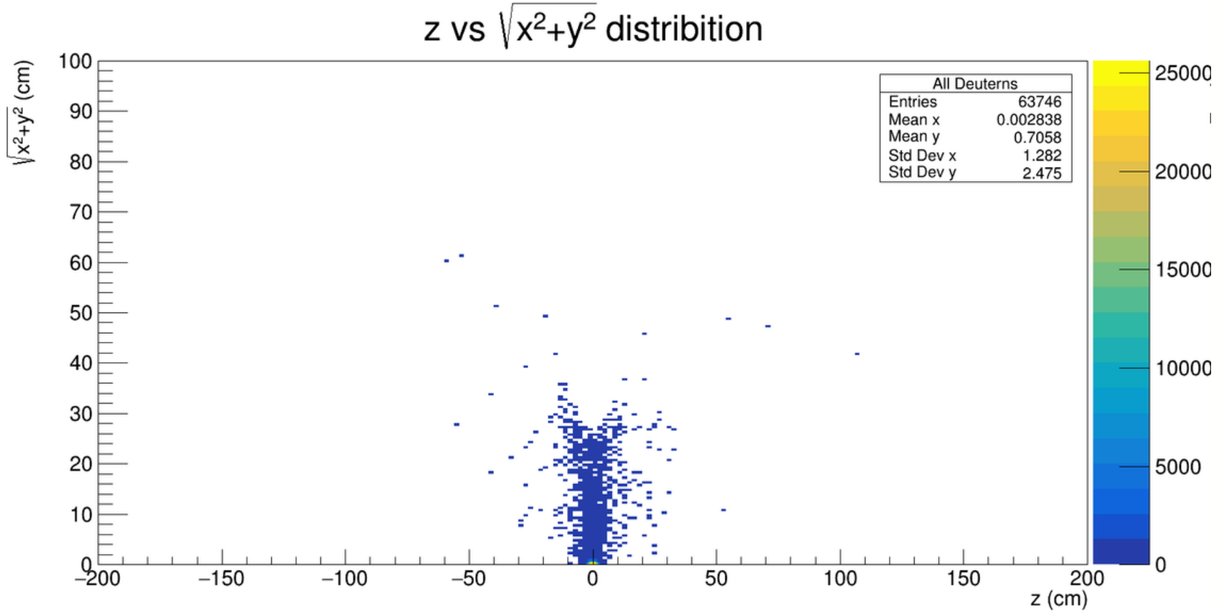
Ratios of secondary particles between all particles on the three directions

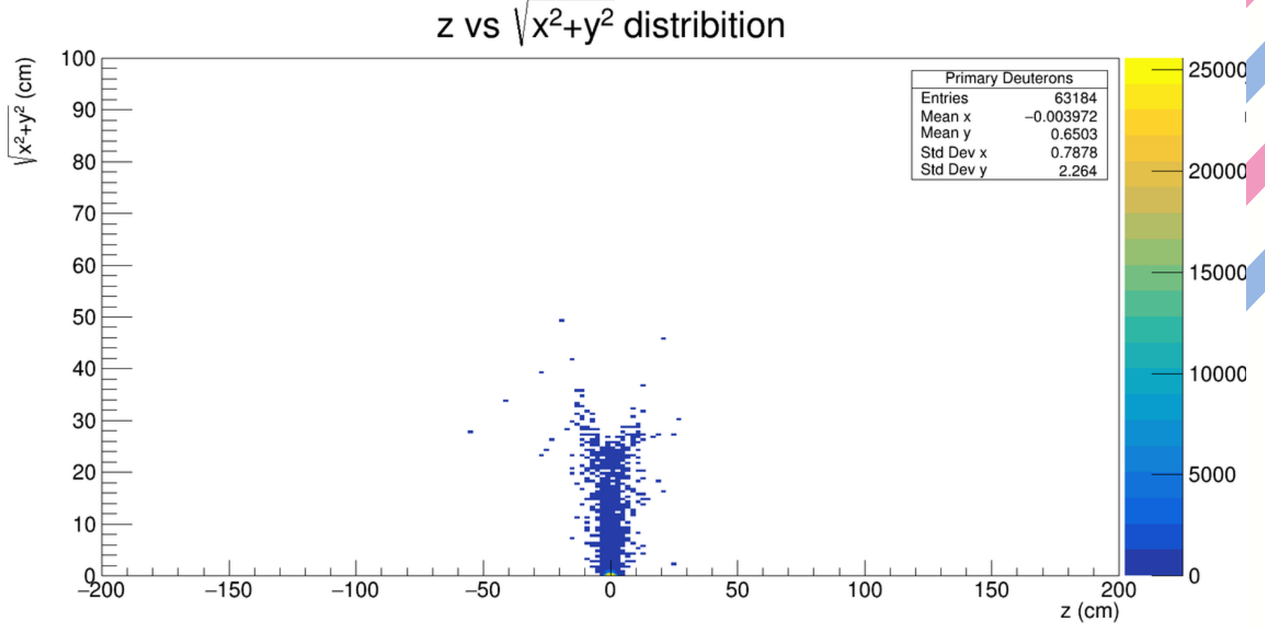


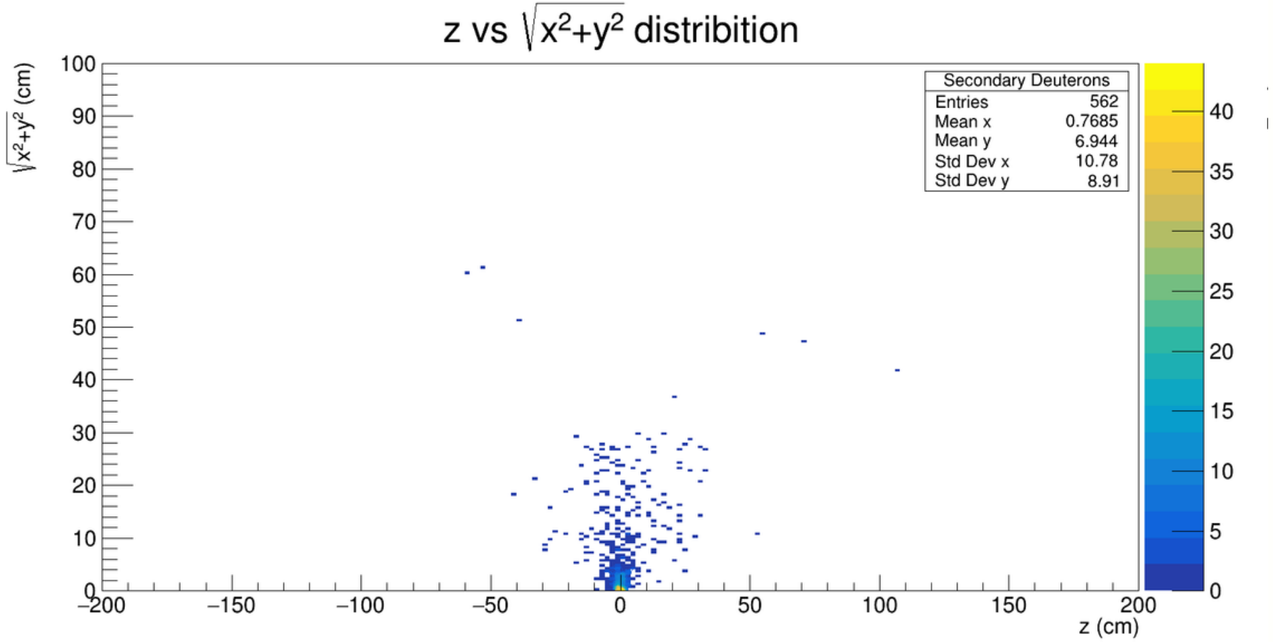




Distribution of Deuterons en z vs radius while function of DCA

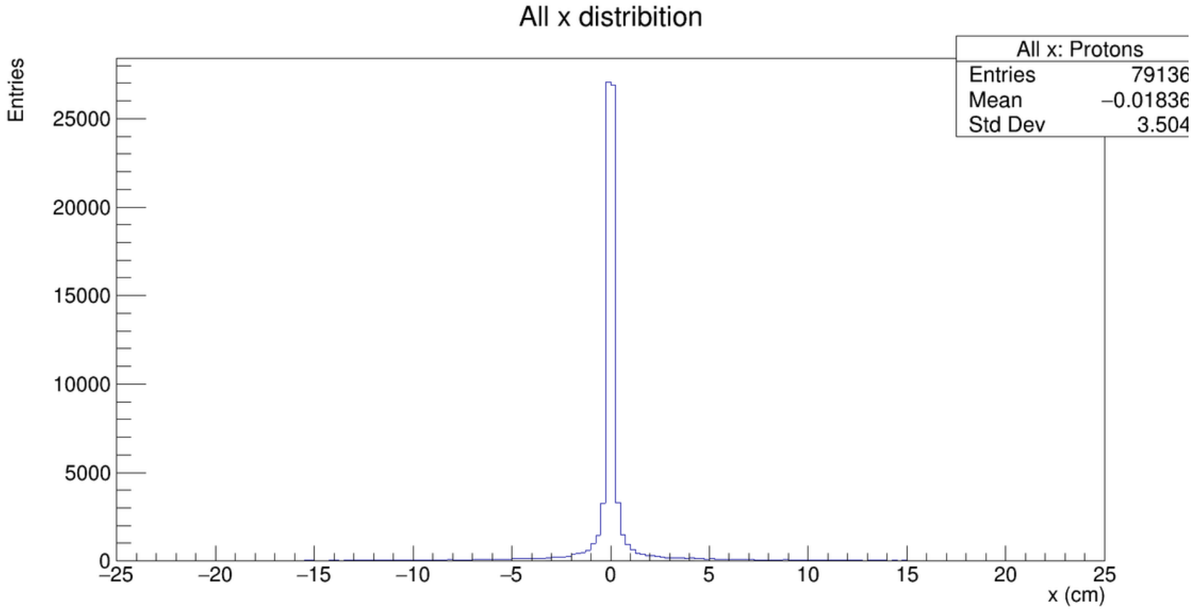


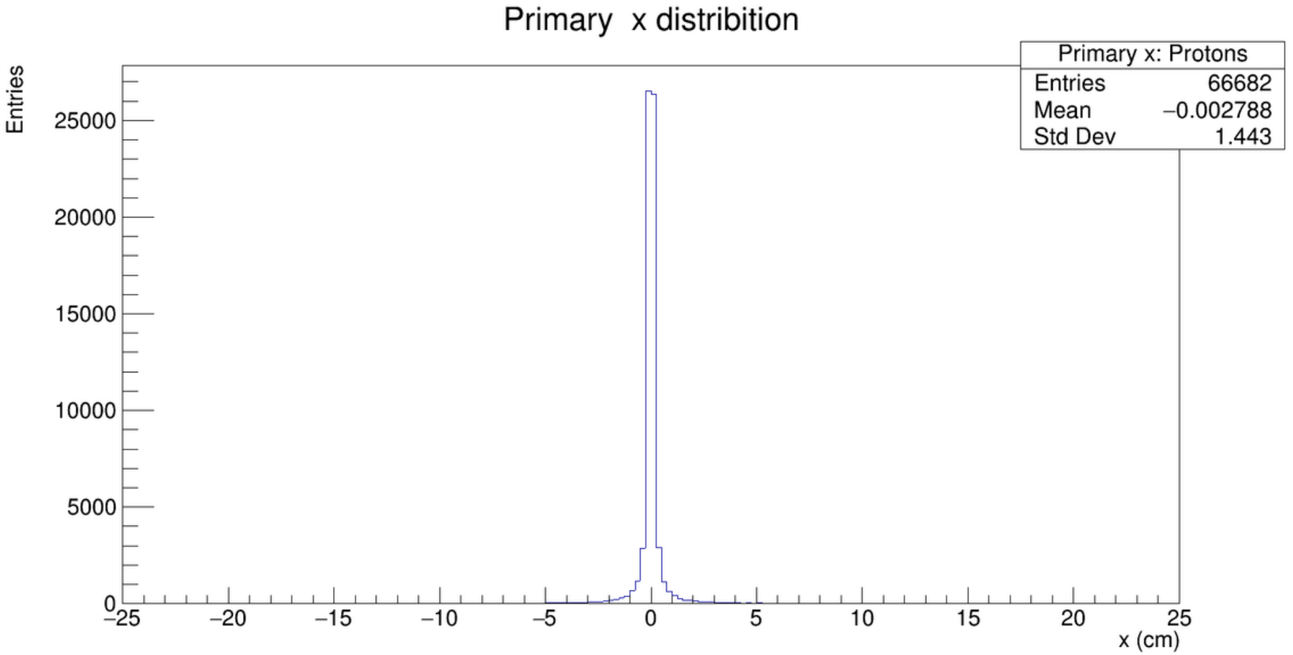


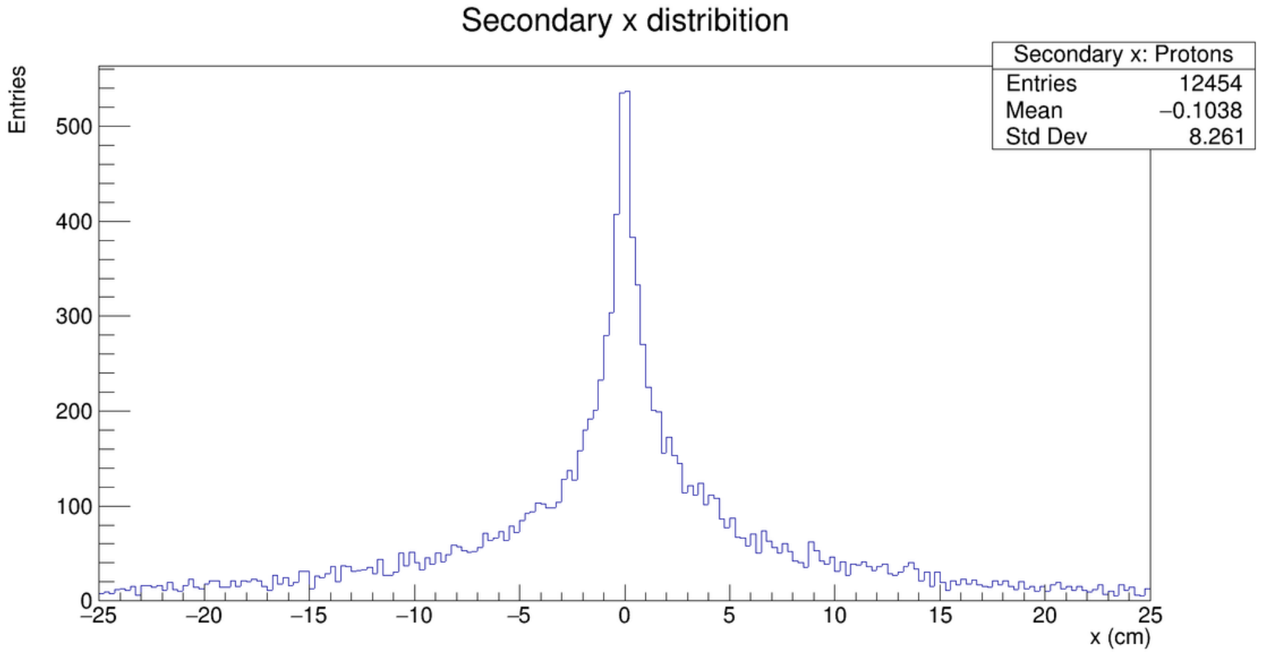


Percentage Deuterons		
All	100__%	63 746
Primary	99.12__%	63 184
Secondary	0.88__%	562

Protons on the axis-x while function of DCAX



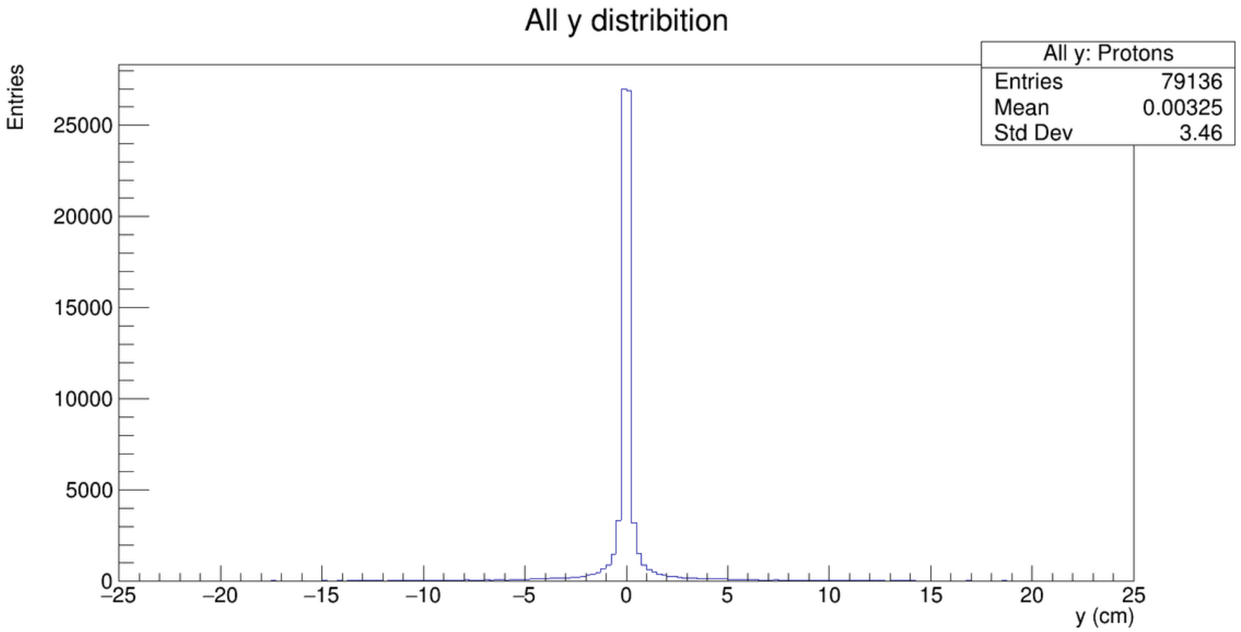


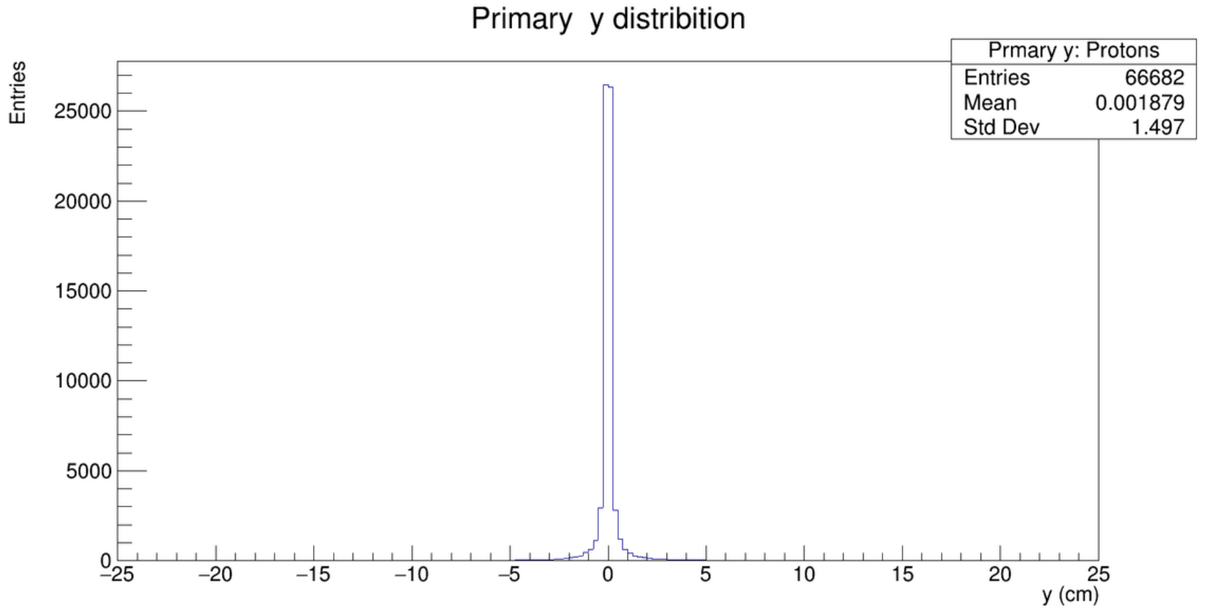


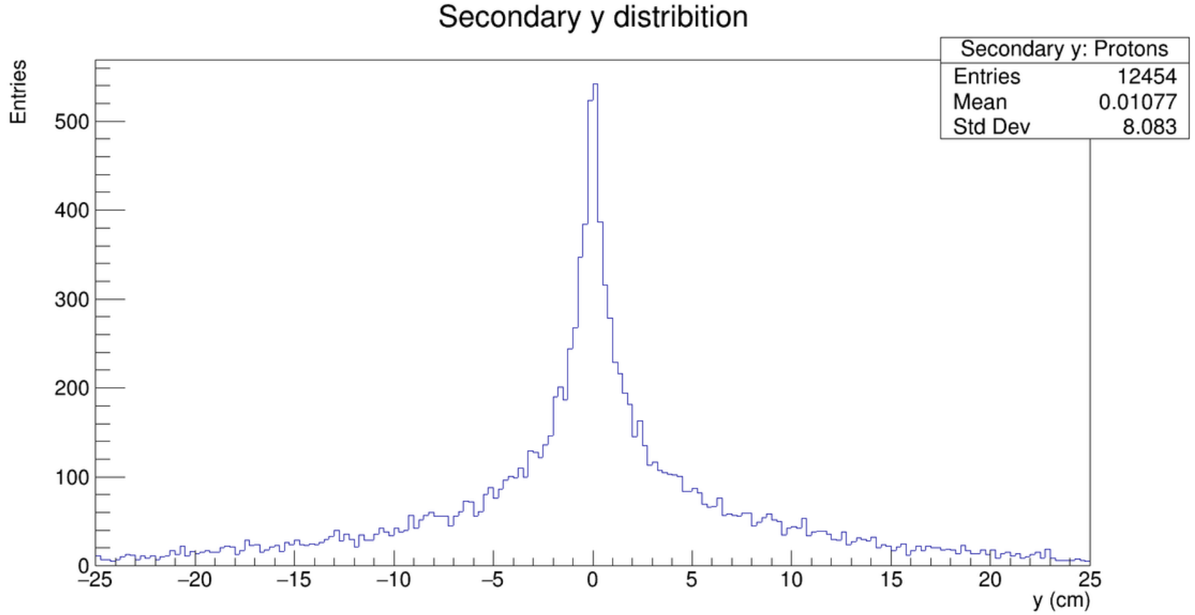
Percentage Deuterons

	All	100__%	79 136
	Primary	84.26__%	66 682
	Secondary	15.74__%	12 454

Protons on the axis-y while function of DCAY



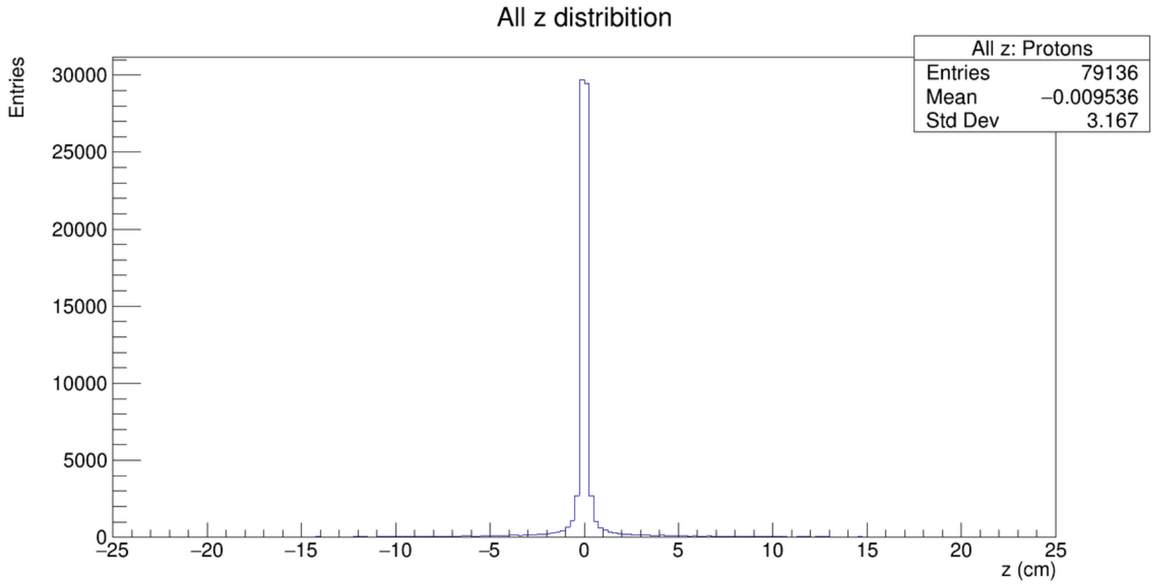


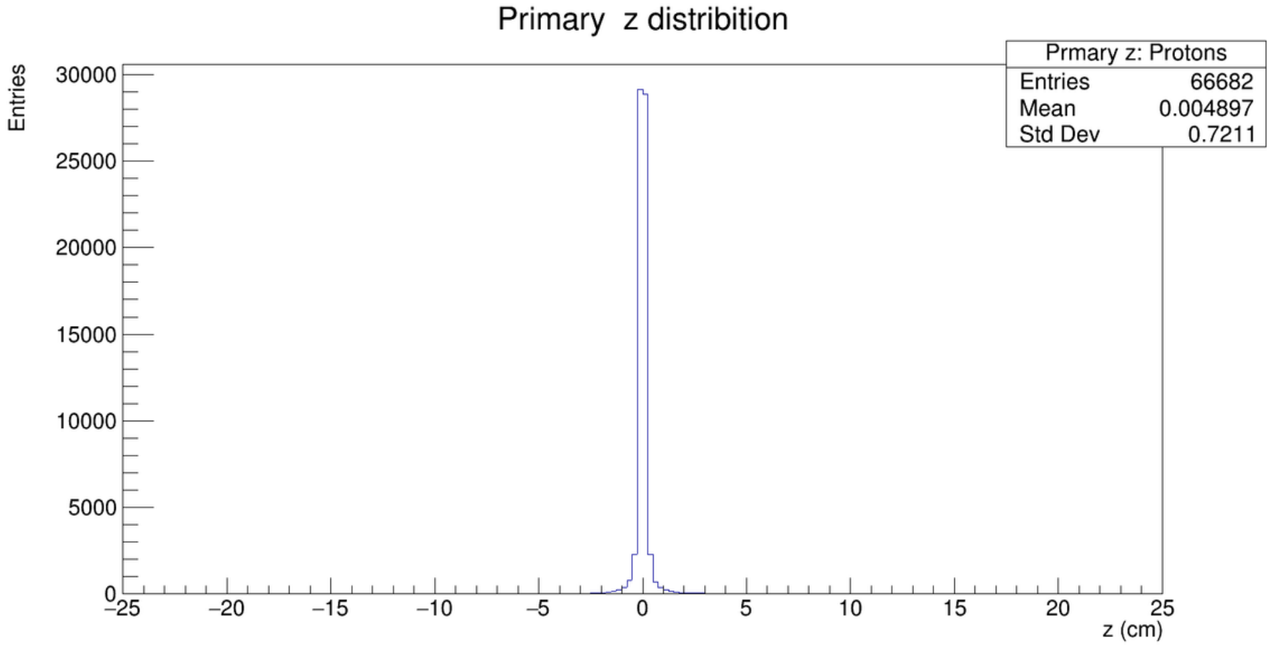


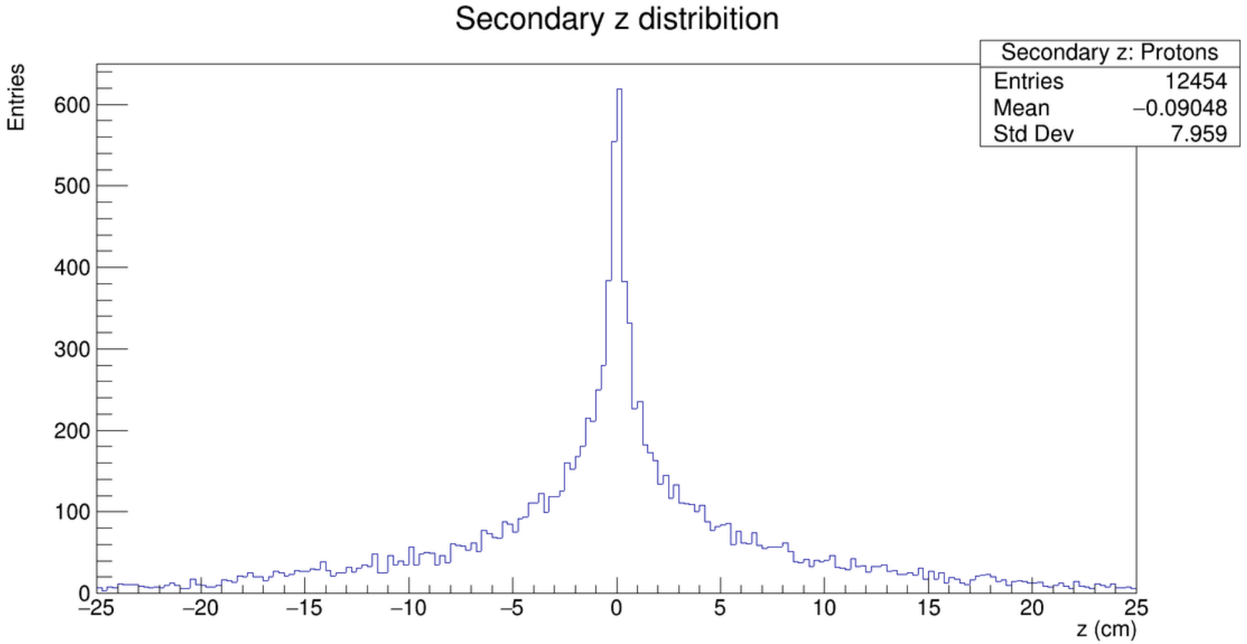
Percentage Deuterons

All	100__%	79 136
Primary	84.26__%	66 682
Secondary	15.74__%	12 454

Protons on the axis-z while function of DCAZ



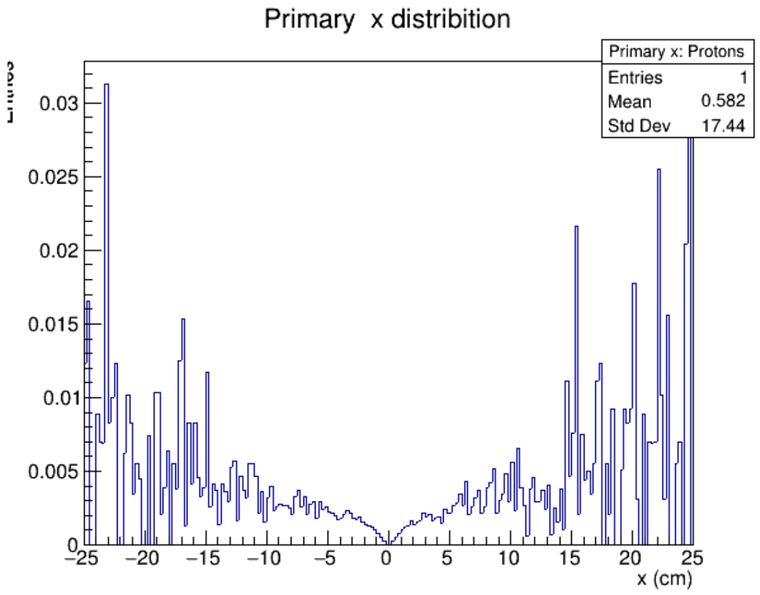


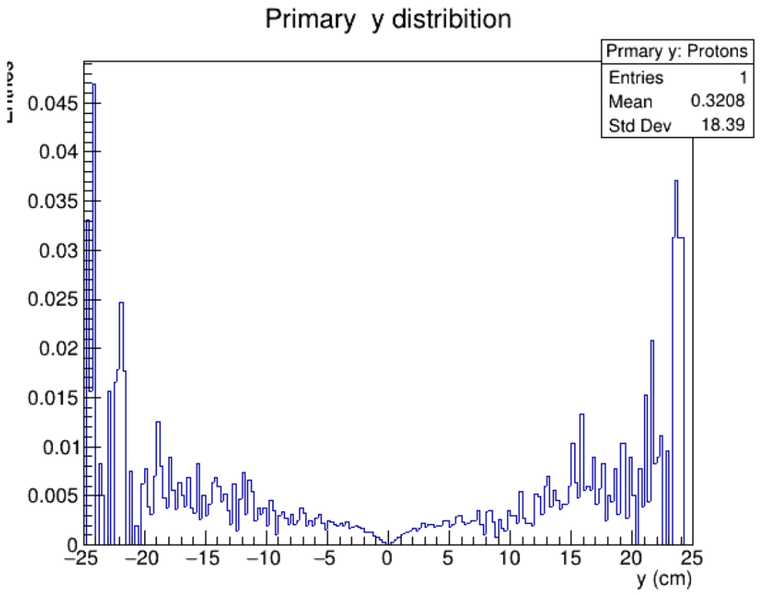


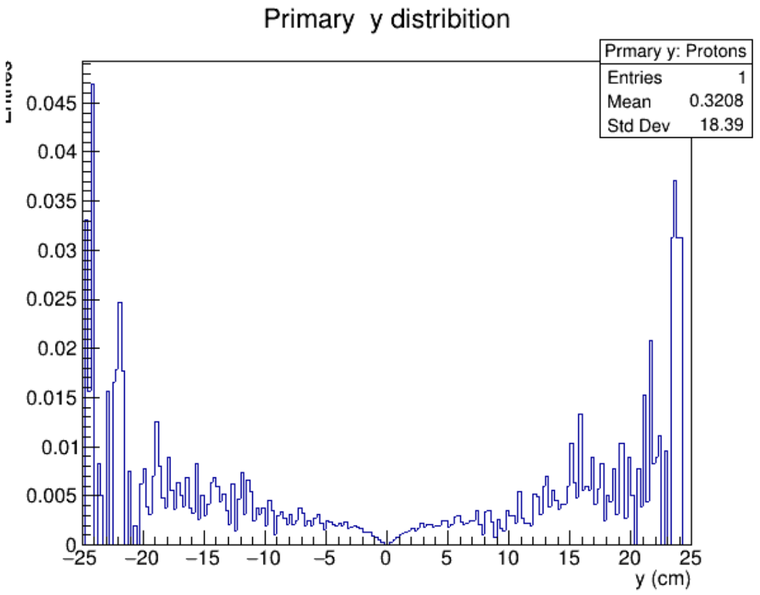
Percentage Deuterons

All	100__%	79 136
Primary	84.26__%	66 682
Secondary	15.74__%	12 454

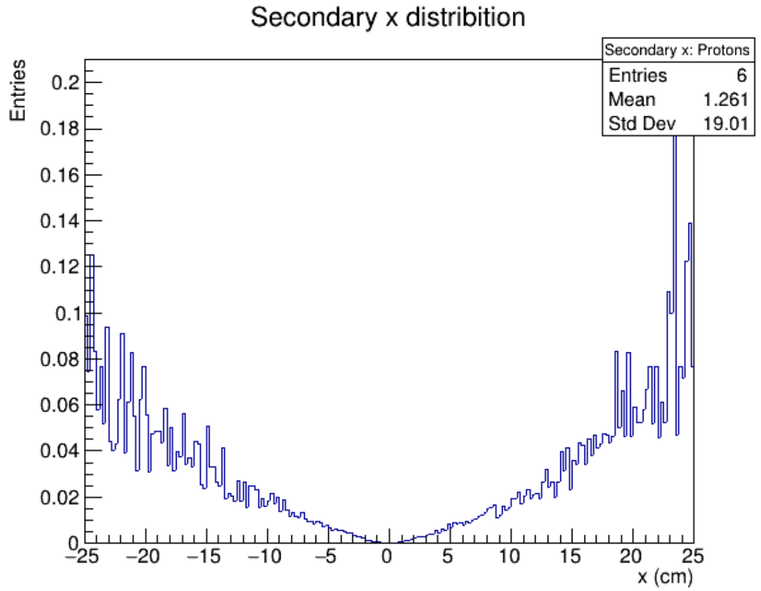
Ratios of primary particles between all particles on the three directions

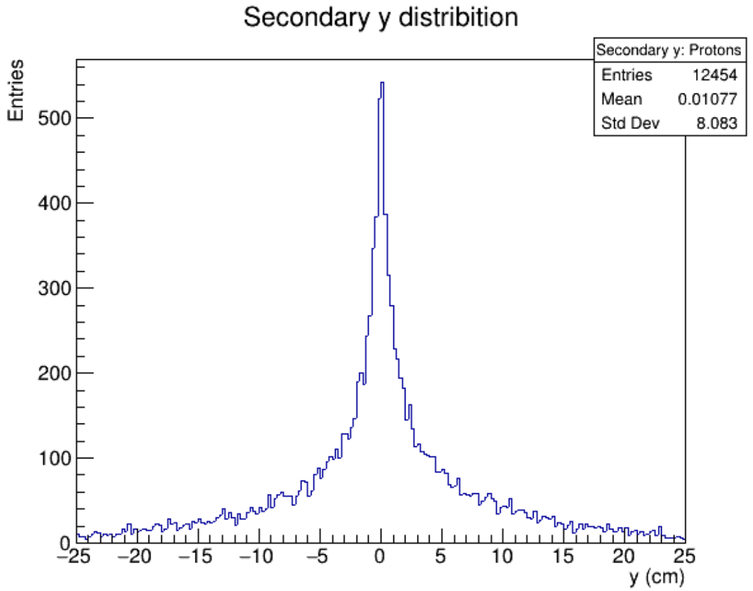


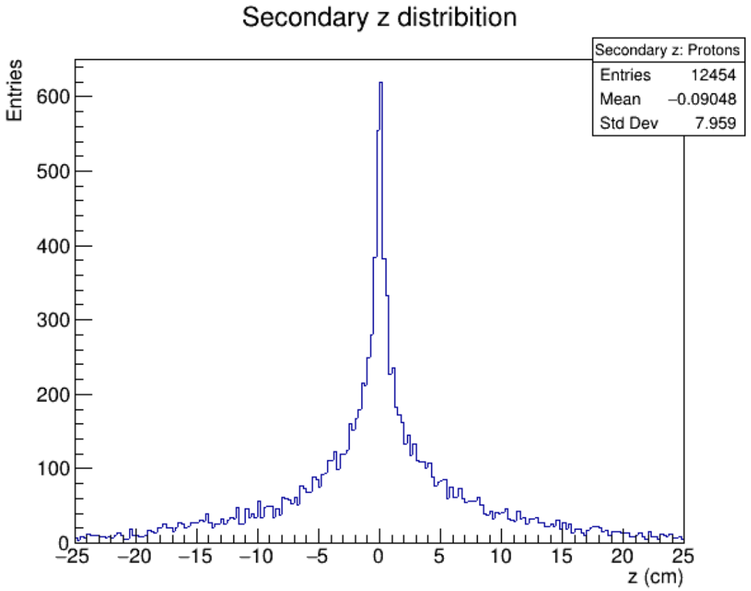




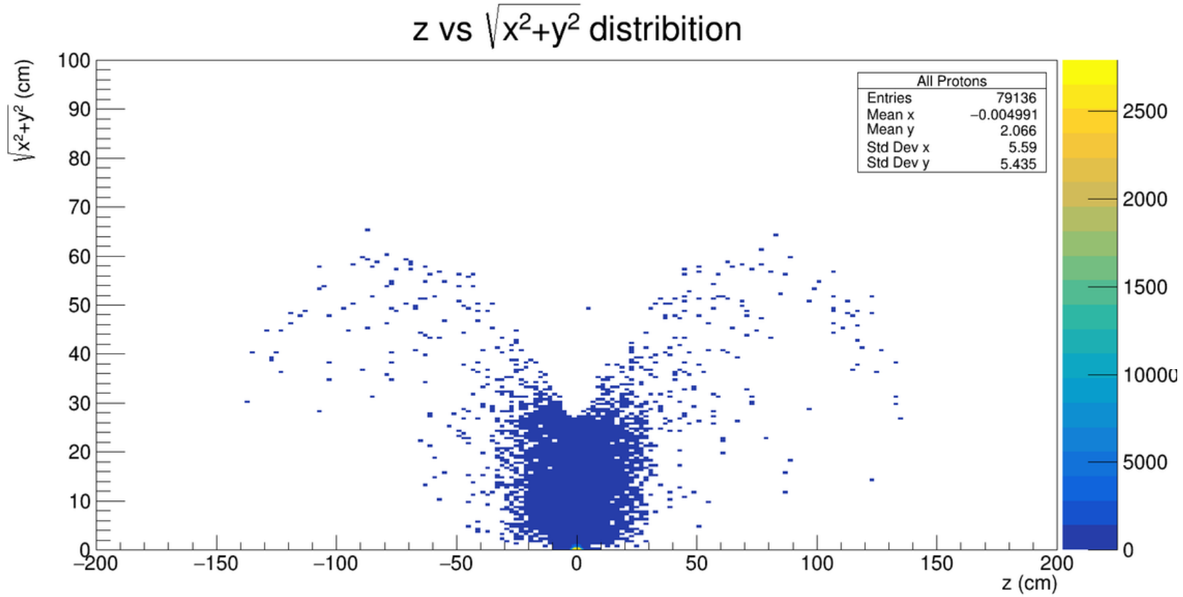
Ratios of secondary particles between all particles on the three directions

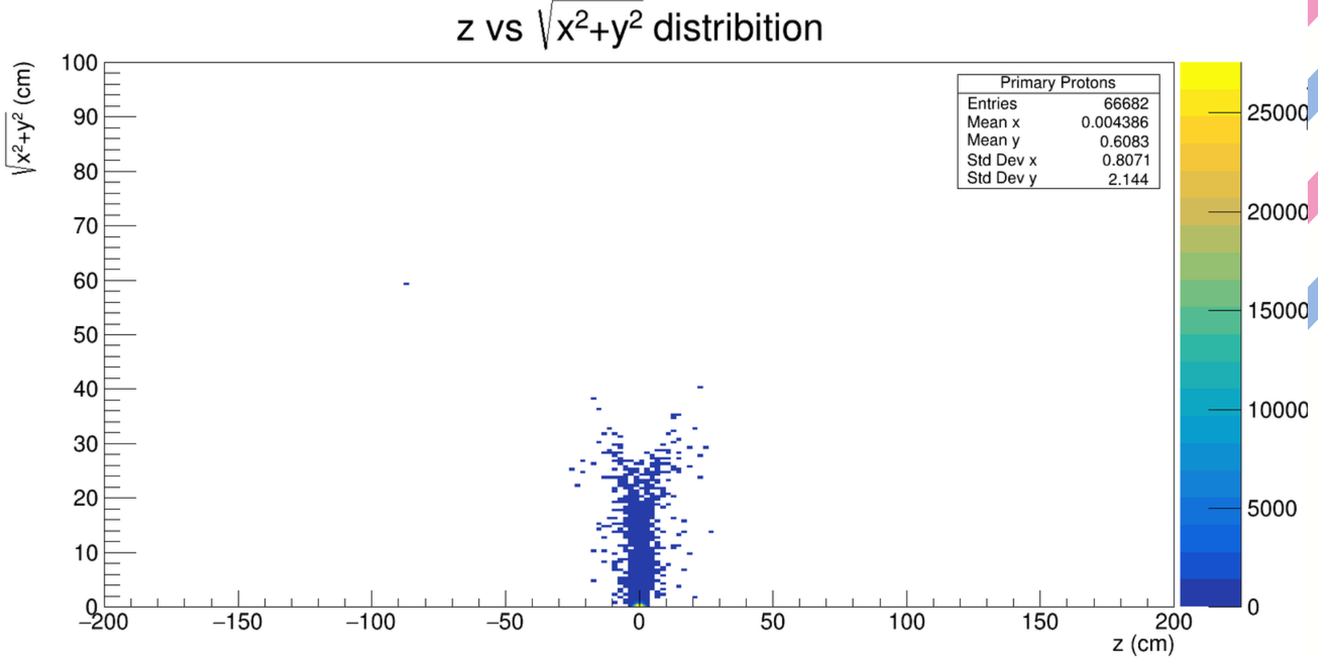


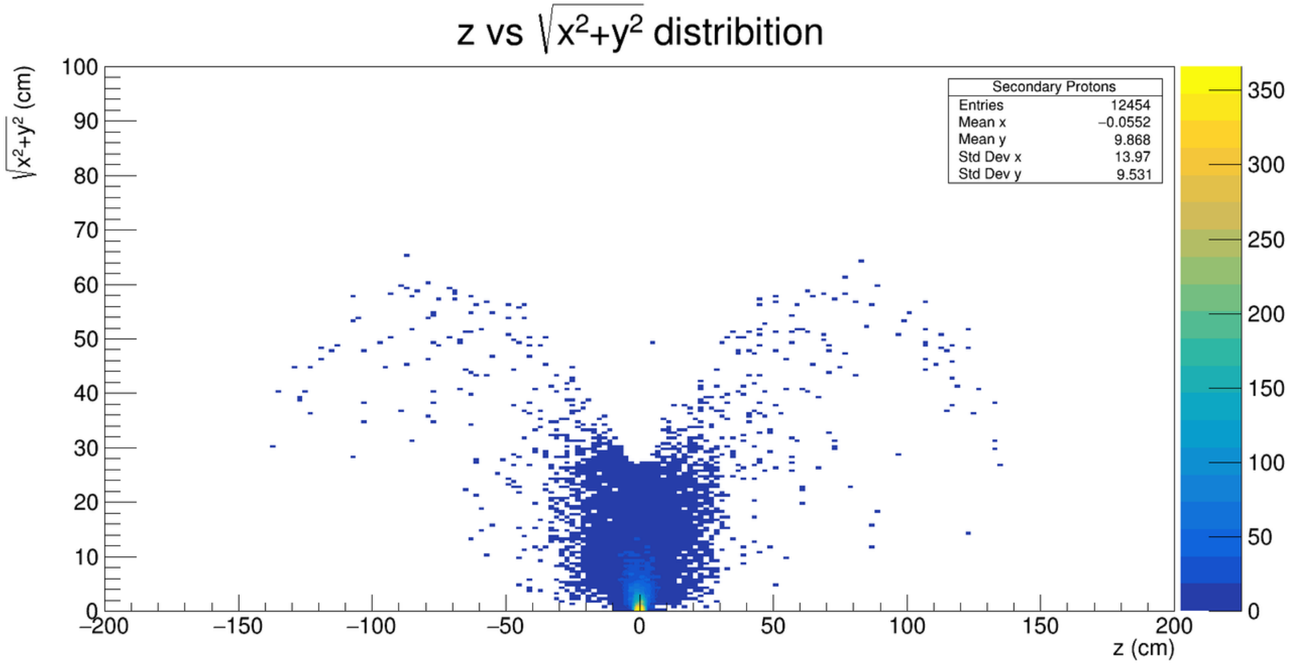




Distribution of Protons en z vs radius while function of DCA







Percentage Deuterons		
All	100__%	79 136
Primary	84.26__%	66 682
Secondary	15.74__%	12 454

With DCAGlobal

```
70      float GetDCAGlobalX() const { return fDCAGlobalX; }
71      float GetDCAGlobalY() const { return fDCAGlobalY; }
72      float GetDCAGlobalZ() const { return fDCAGlobalZ; }
```

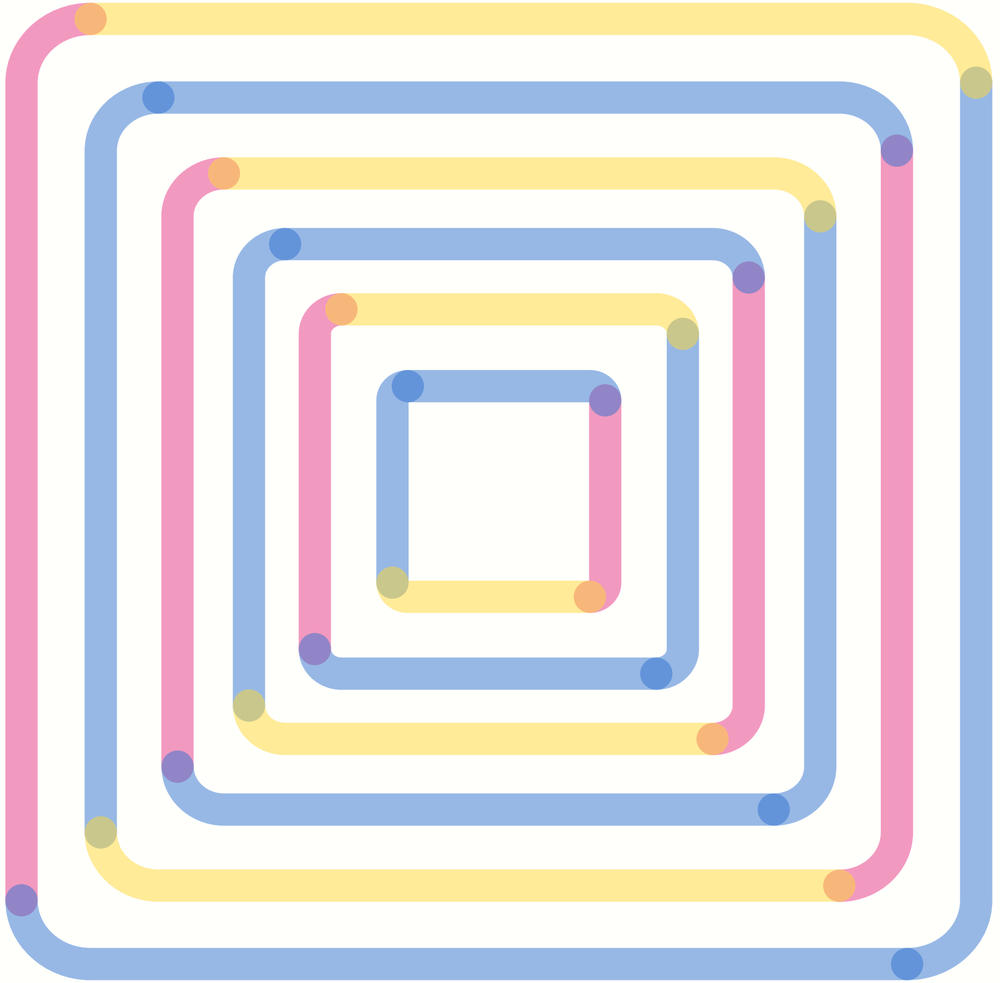
I make the histogrmas with DCAGlobal, & I used this datas

Data with the generator PHQMD, the Hipernucleos data in the request Bi+Bi Sqrt(s)=9.2AGeV
100,000 events

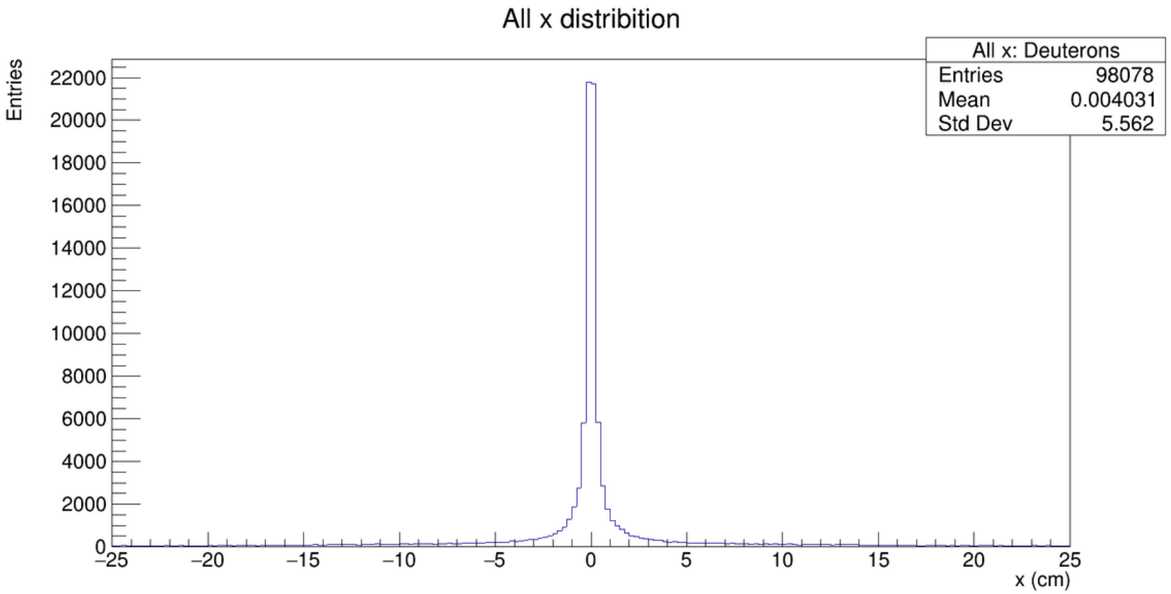
Data with the generator BOX
100,000 events

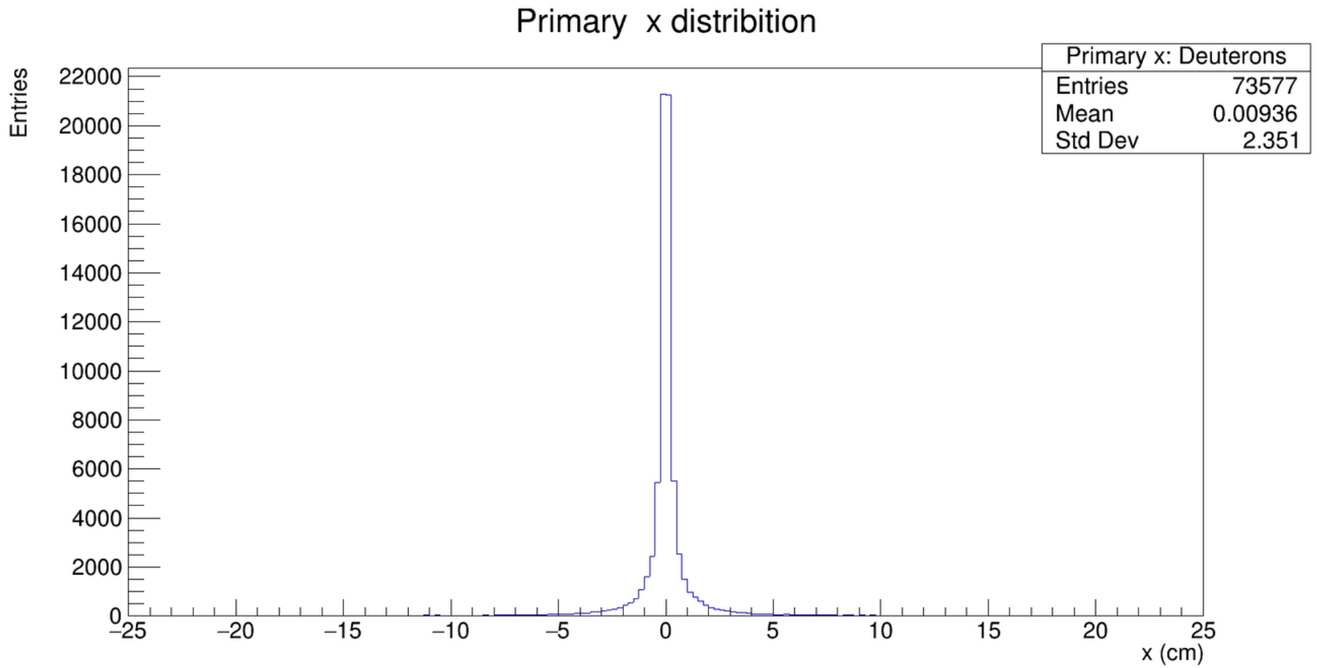
Data with the generator PHQMD, the Hipernucleos data in the request Bi+Bi Sqrt(s)=9.2AGeV

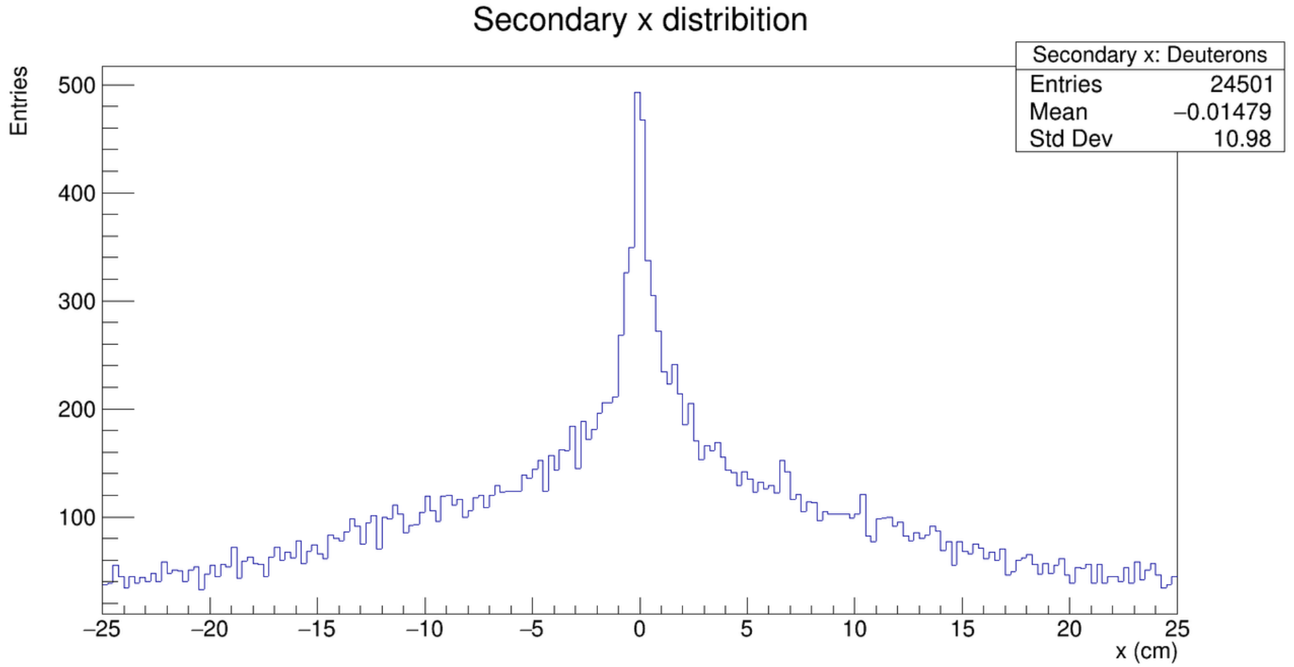
100,000 events



Deuterons on the axis-x while function of DCAGlobalX



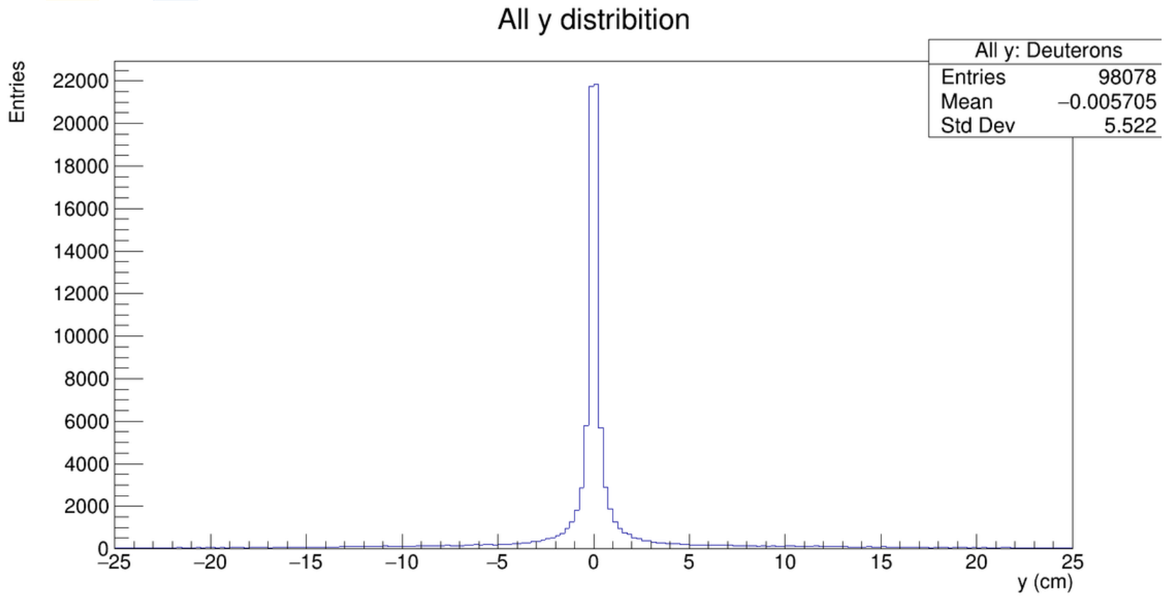


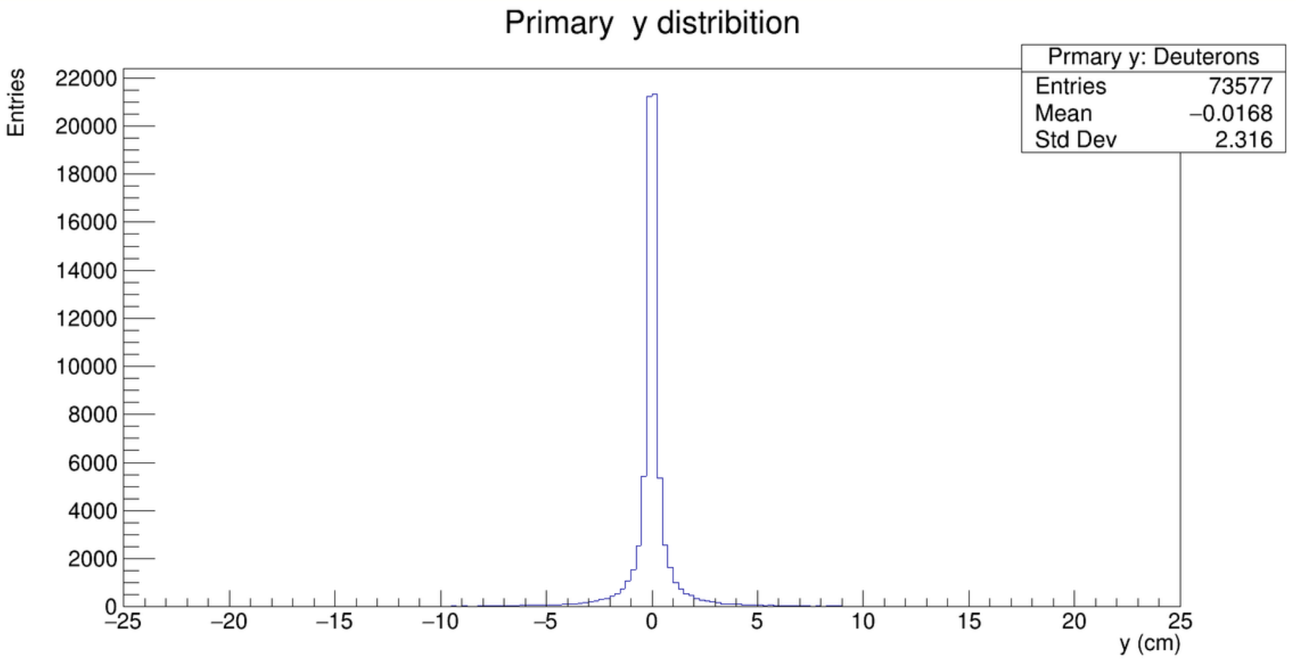


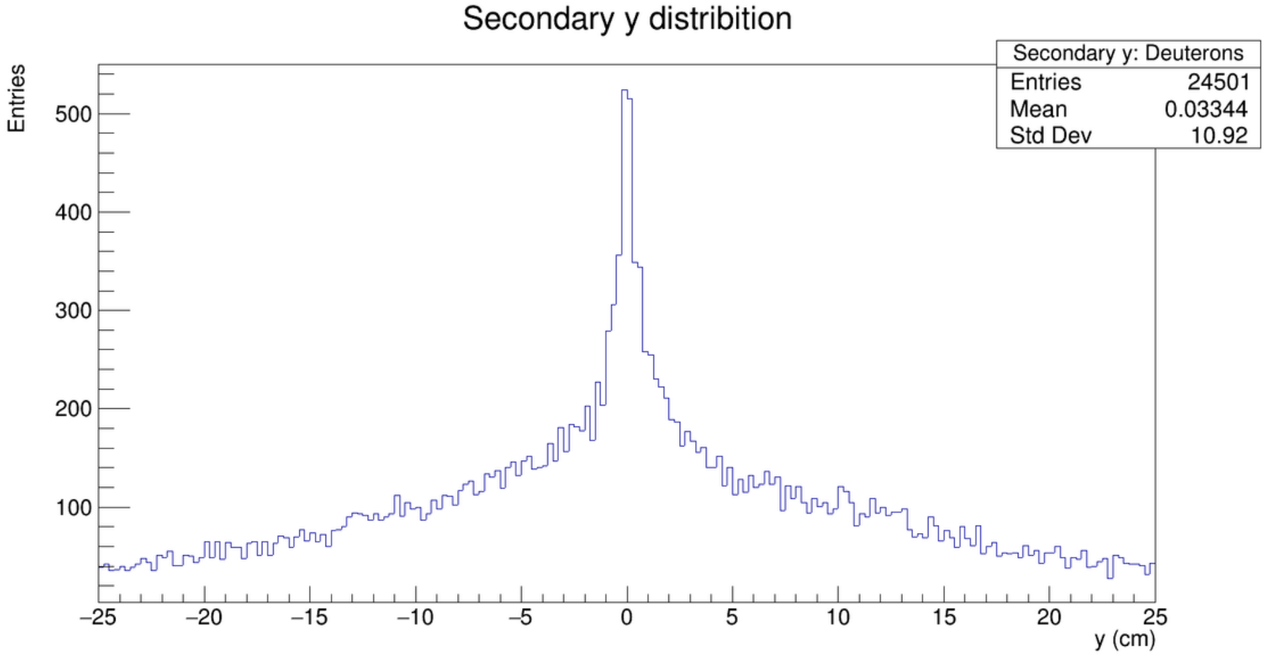
Percentage Deuterons

All	100__%	98 078
Primary	75.02__%	73 577
Secondary	24.98__%	24 501

Deuterons on the axis-y while function of DCAGlobalY



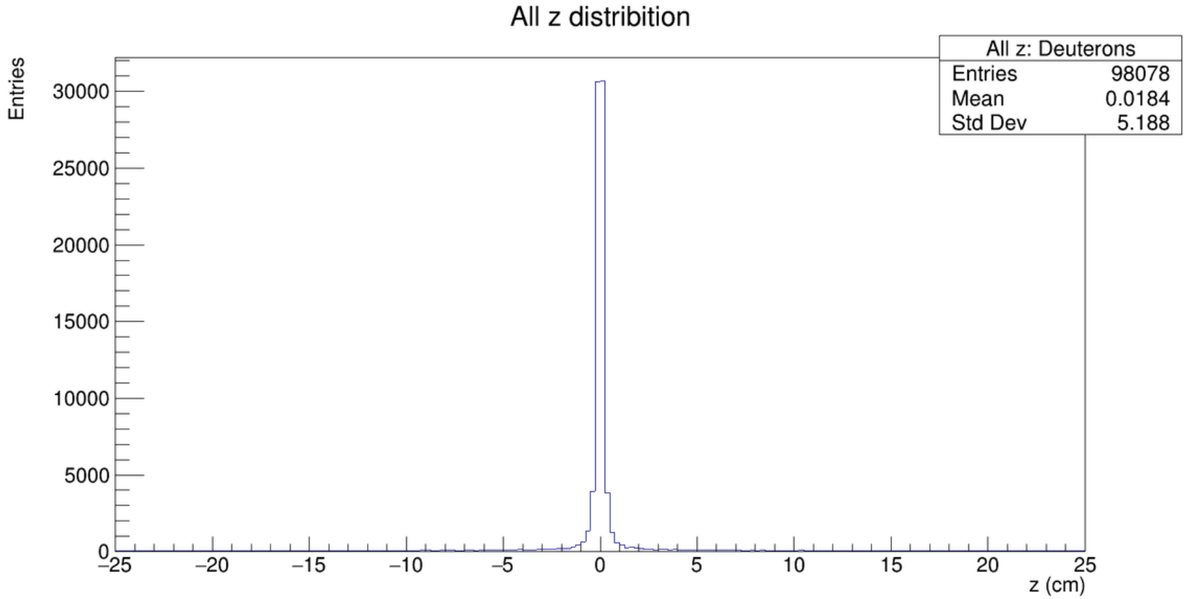




Percentage Deuterons

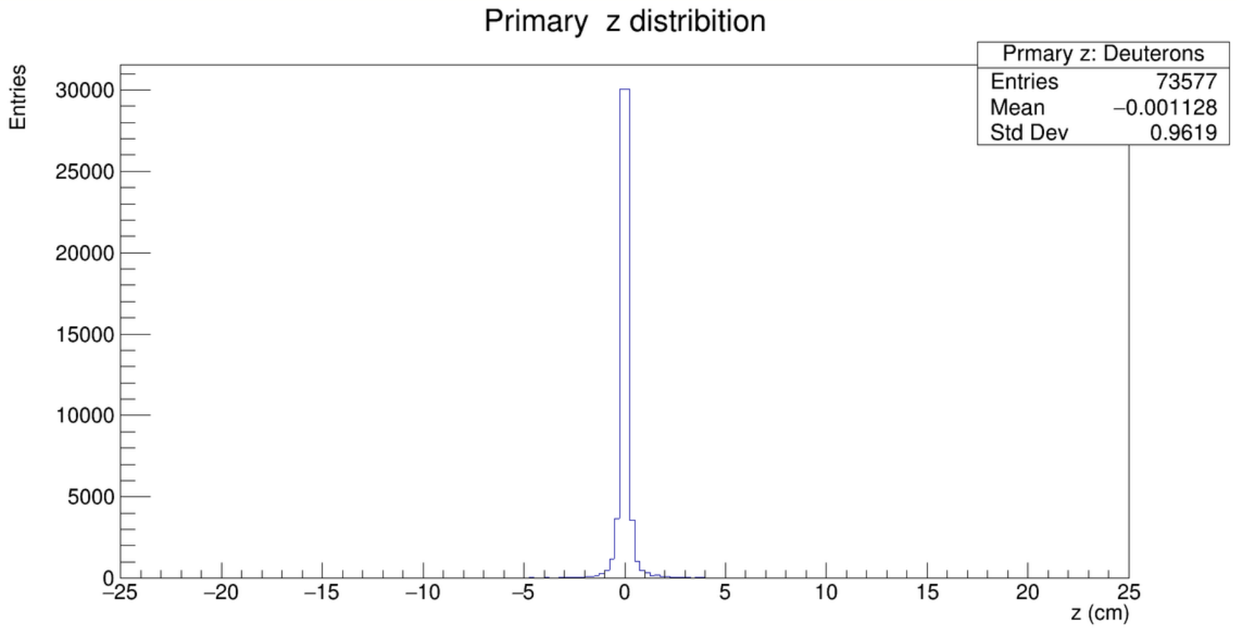
All	100__%	98 078
Primary	75.02__%	73 577
Secondary	24.98__%	24 501

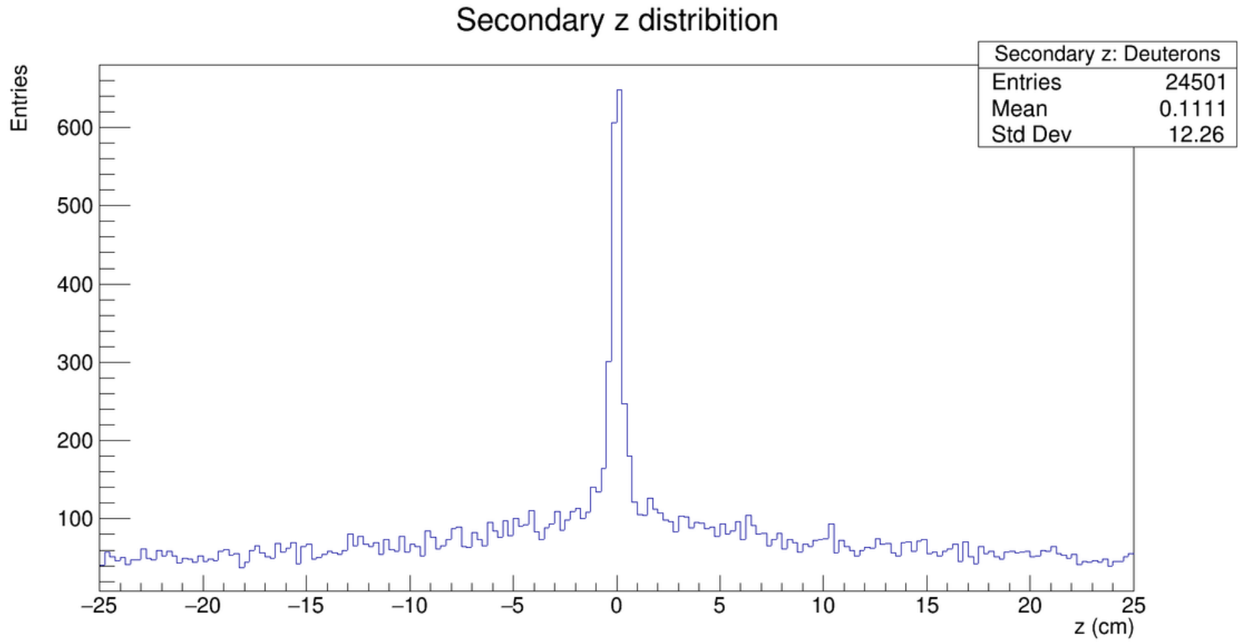
Deuterons on the axis-z while function of DCAGlobalZ



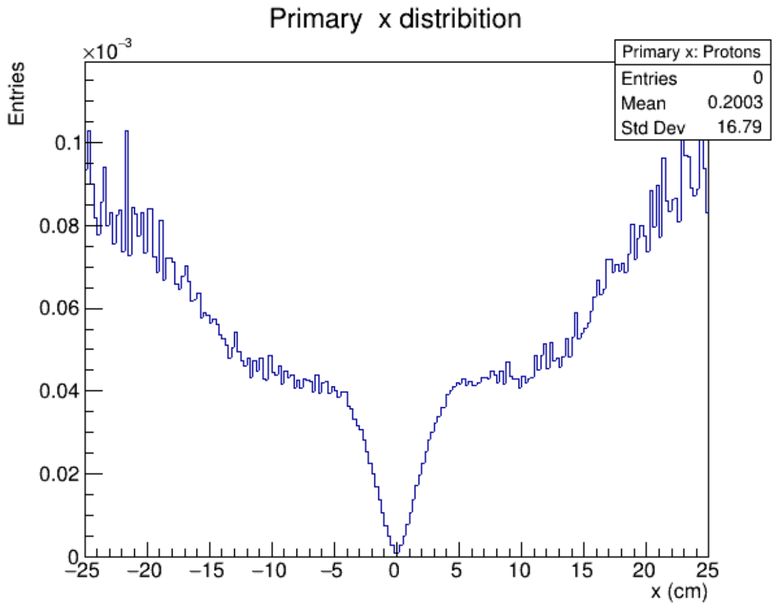
Percentage Deuterons

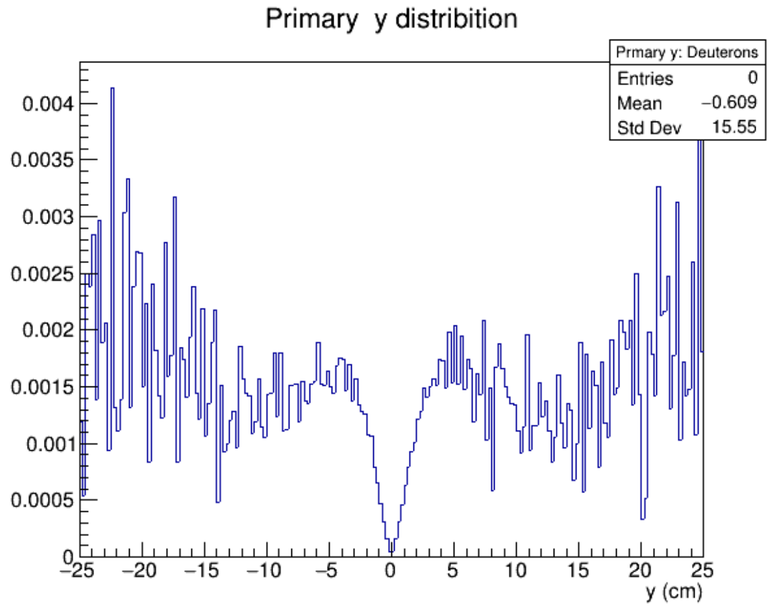
All	100__%	98 078
Primary	75.02__%	73 577
Secondary	24.98__%	24 501

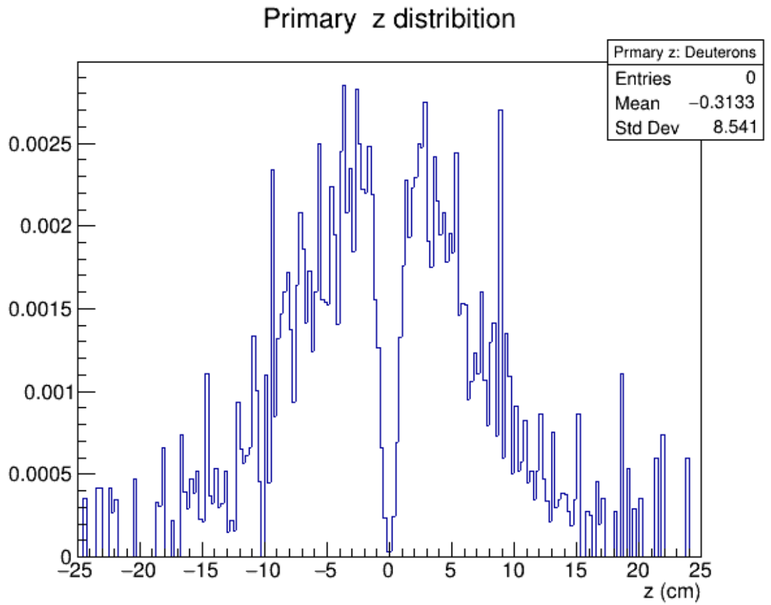




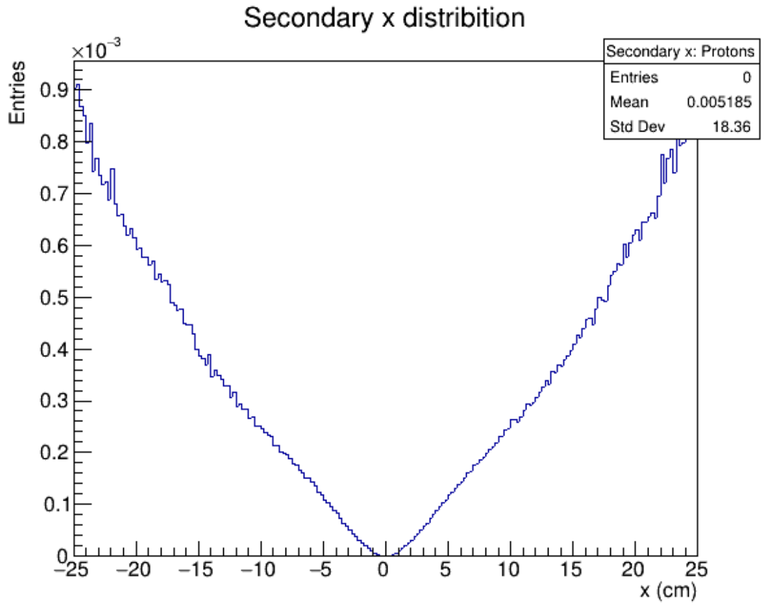
Ratios of primary particles between all particles on the three directions

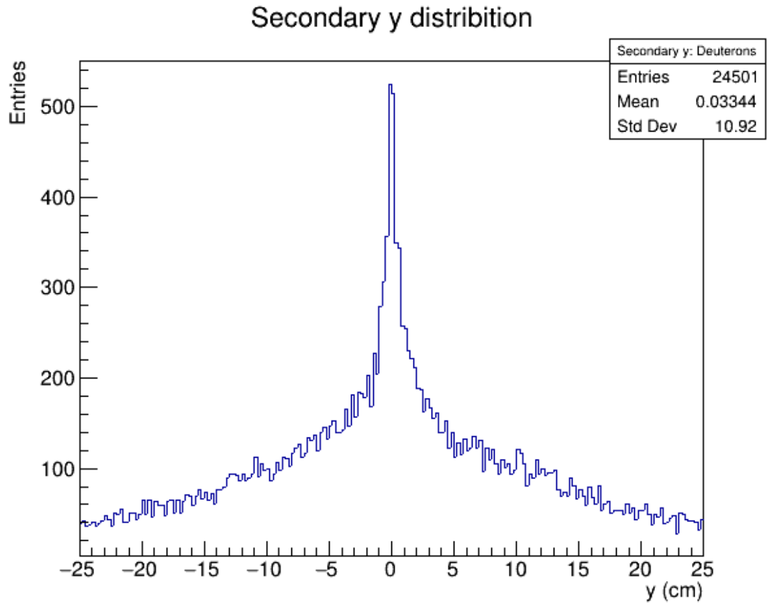


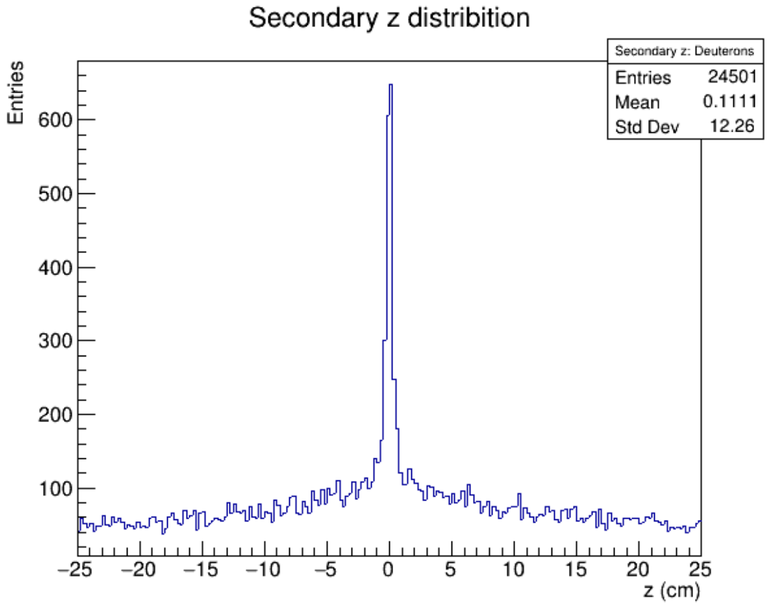




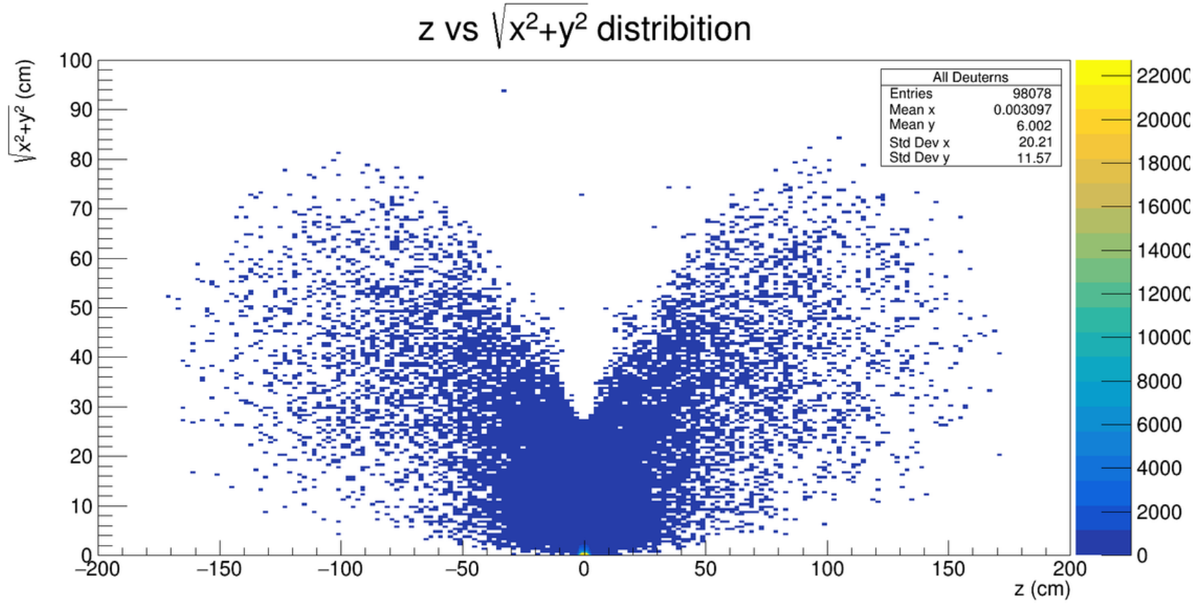
Ratios of secondary particles between all particles on the three directions

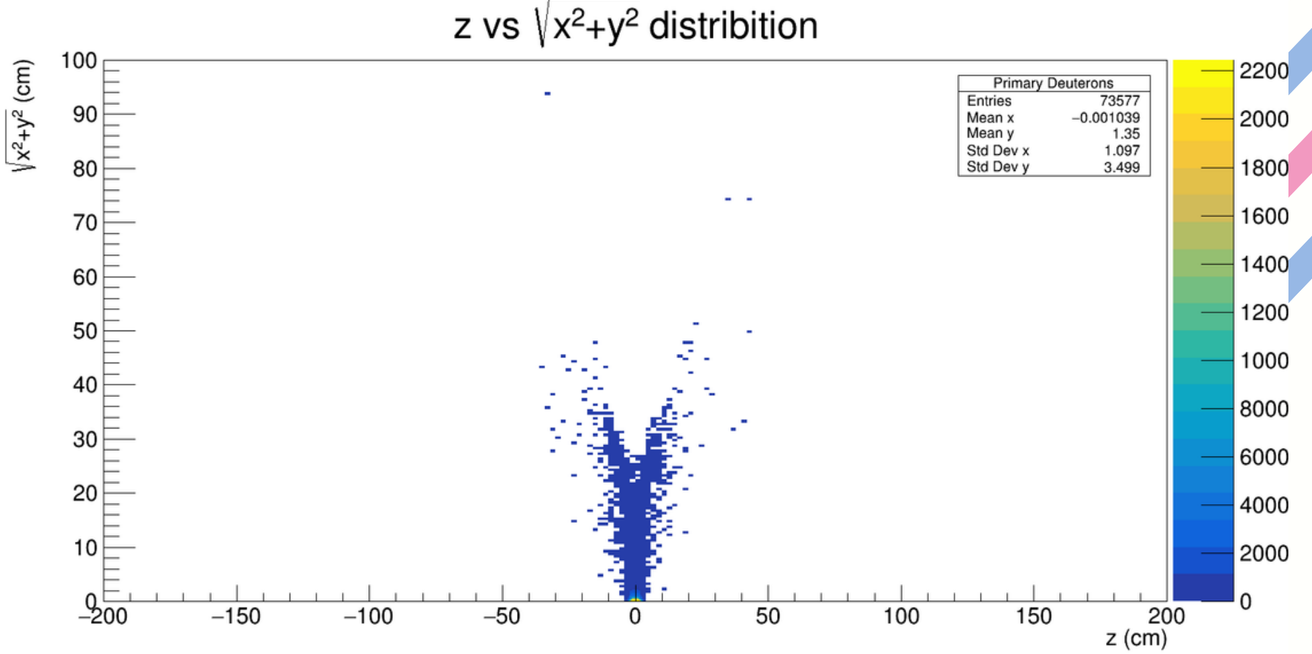


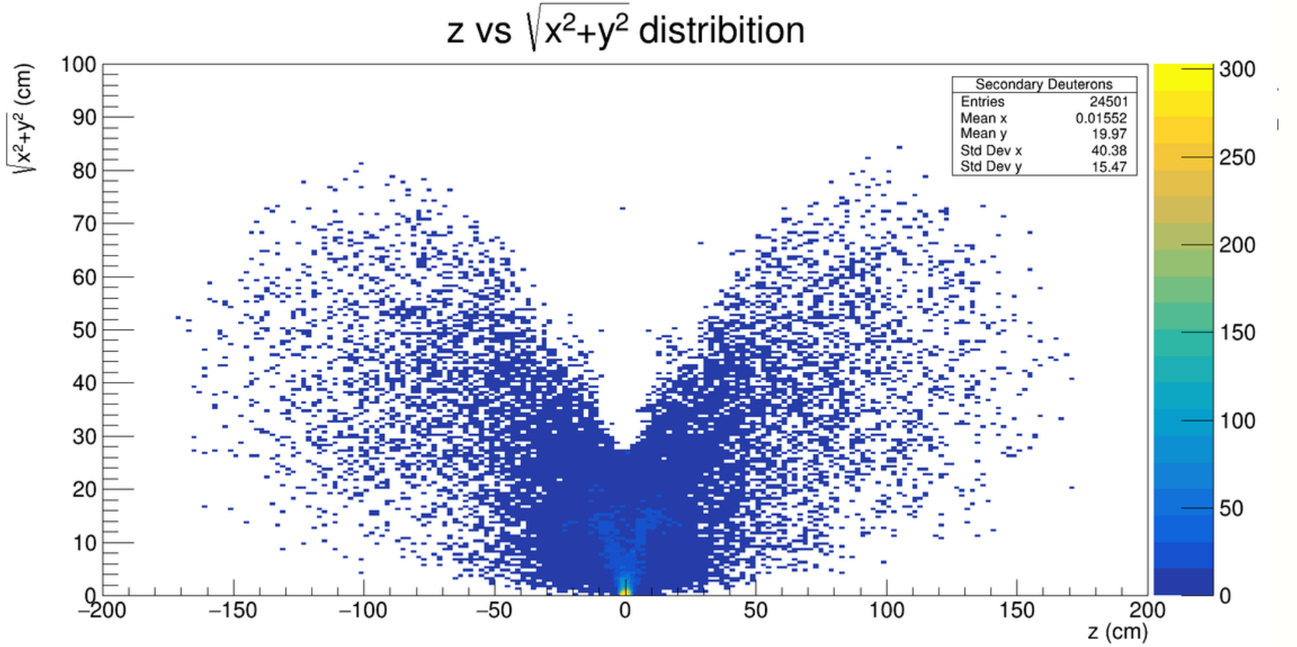




Distribution of Deuterons en z vs radius while function of DCAGlobal



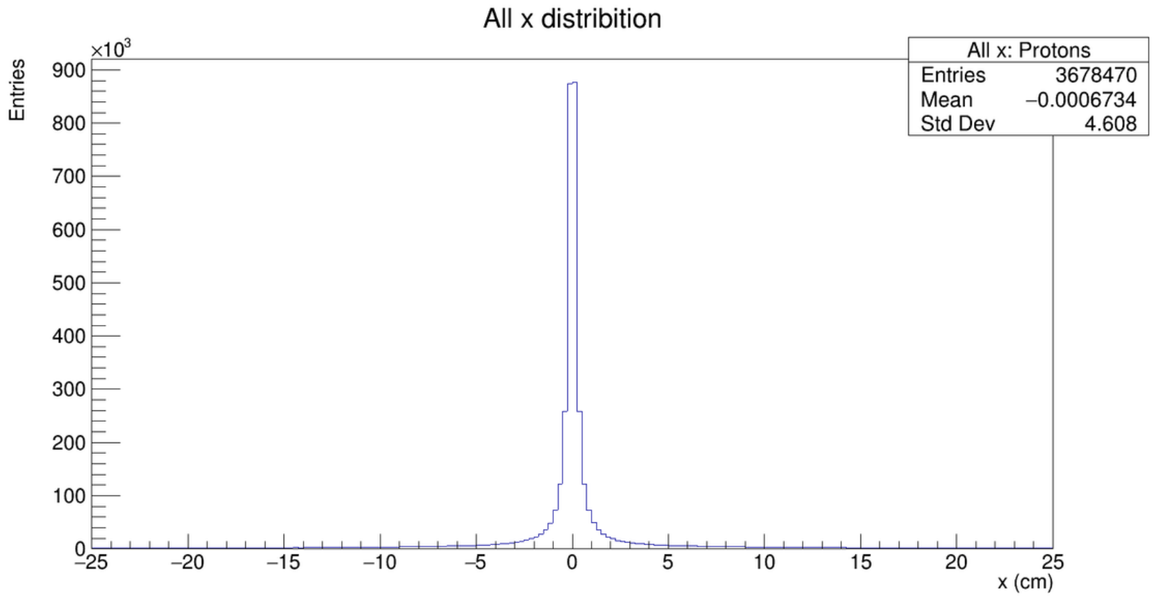


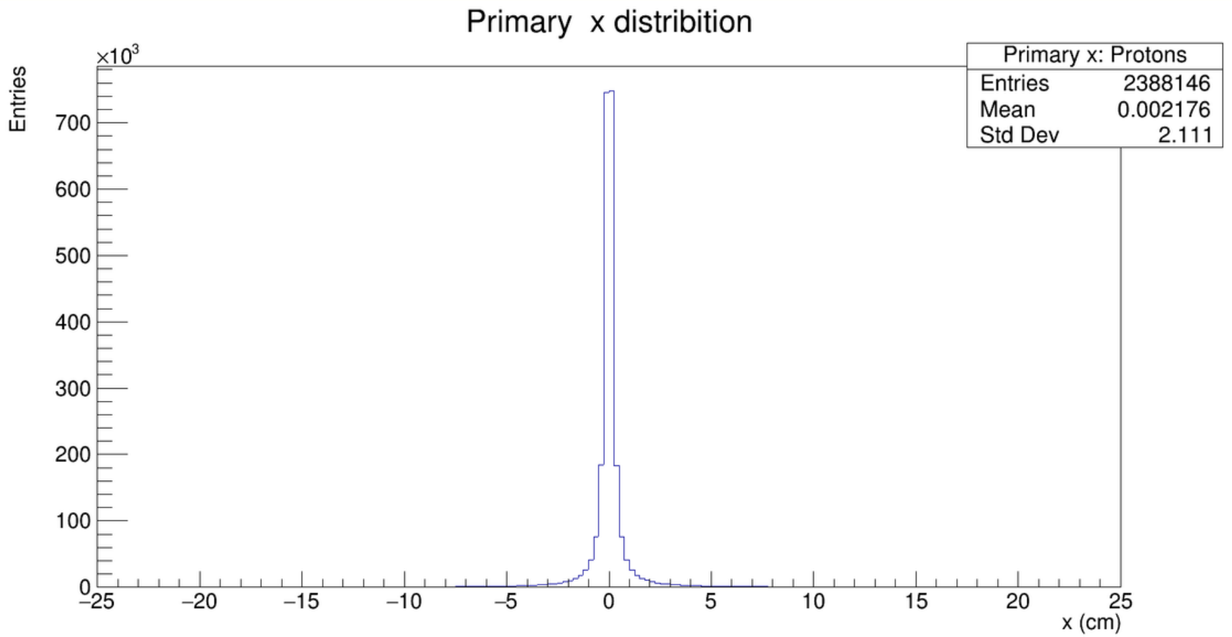


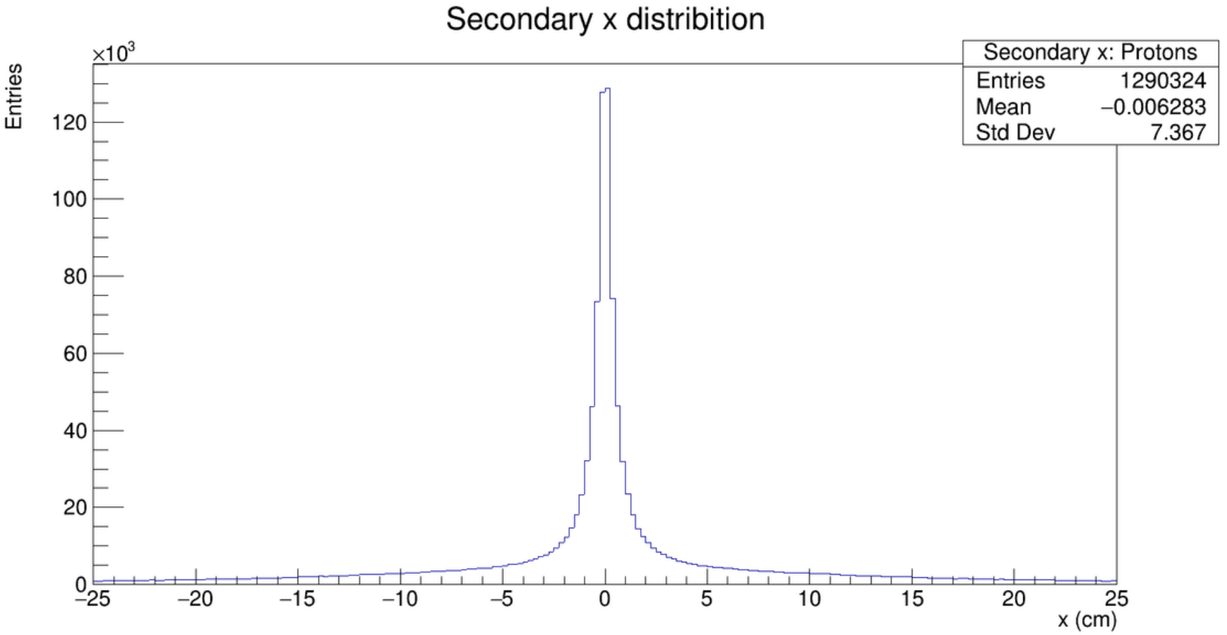
Percentage Deuterons

All	100__%	98 078
Primary	75.02__%	73 577
Secondary	24.98__%	24 501

Protons on the axis-x while function of DCAGlobalX



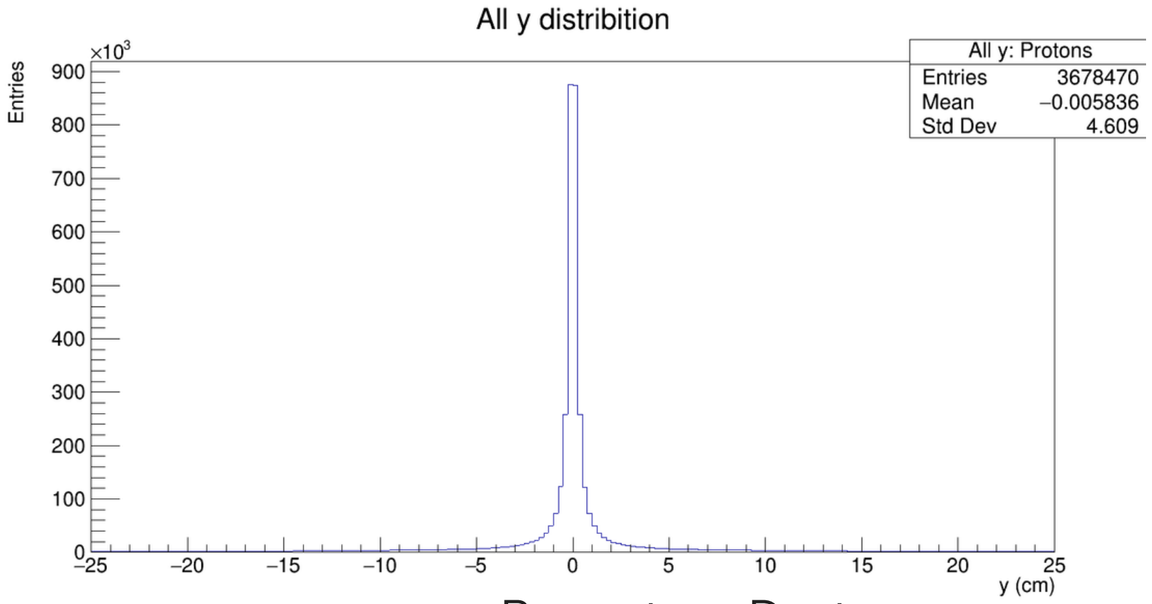


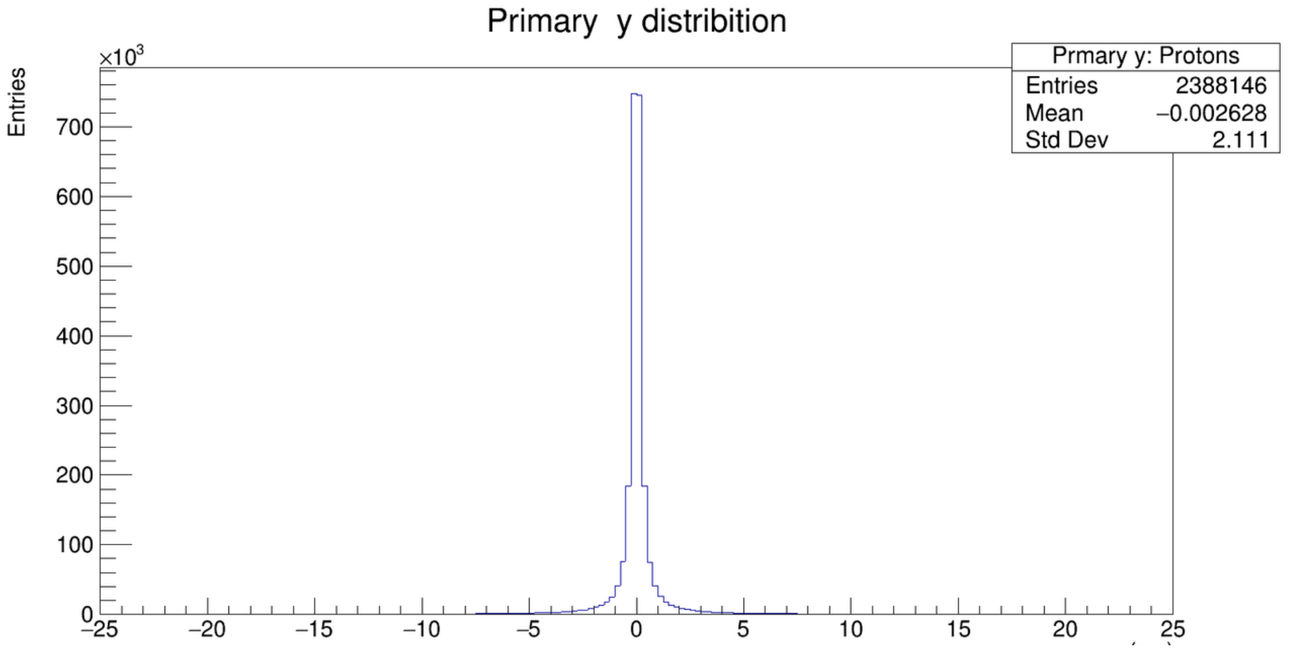


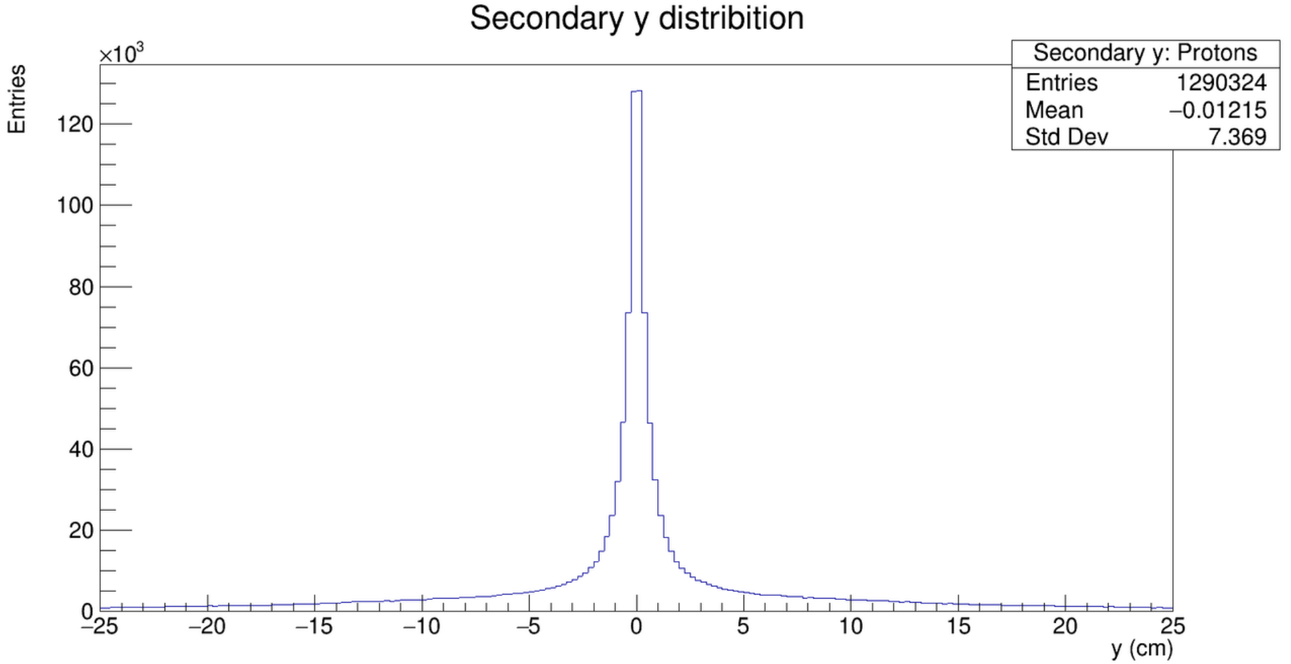
Percentage Deuterons

All	100__%	3 678 470
Primary	64.92__%	2 388 146
Secondary	35.08__%	1 290 324

Protons on the axis-y while function of DCAGlobalY



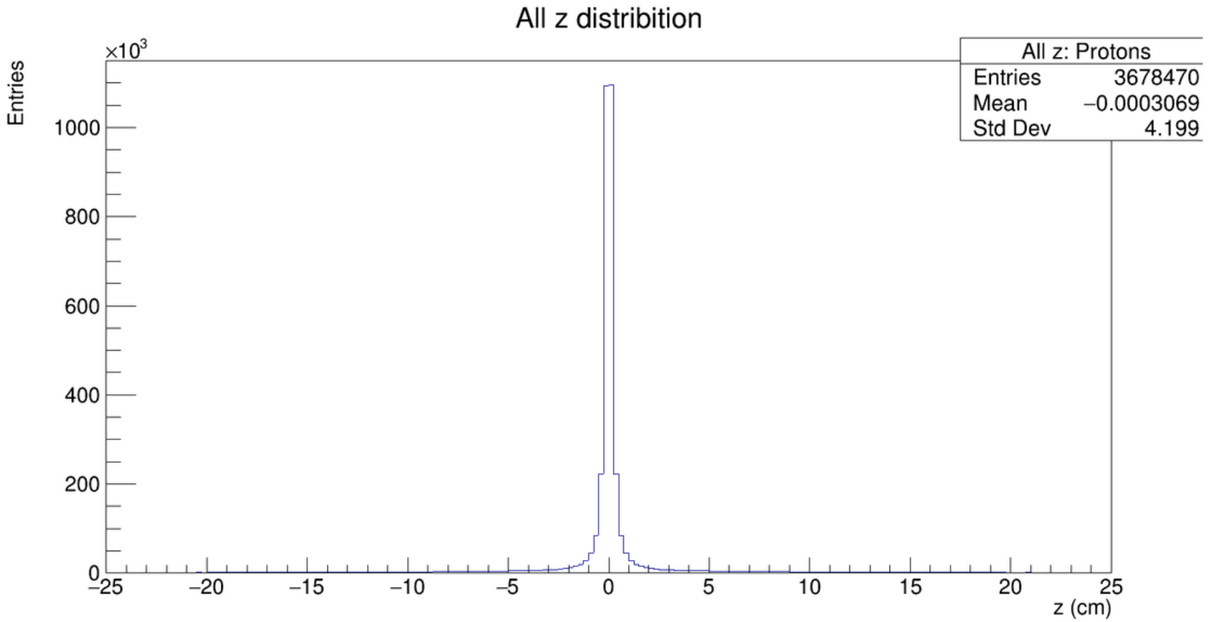


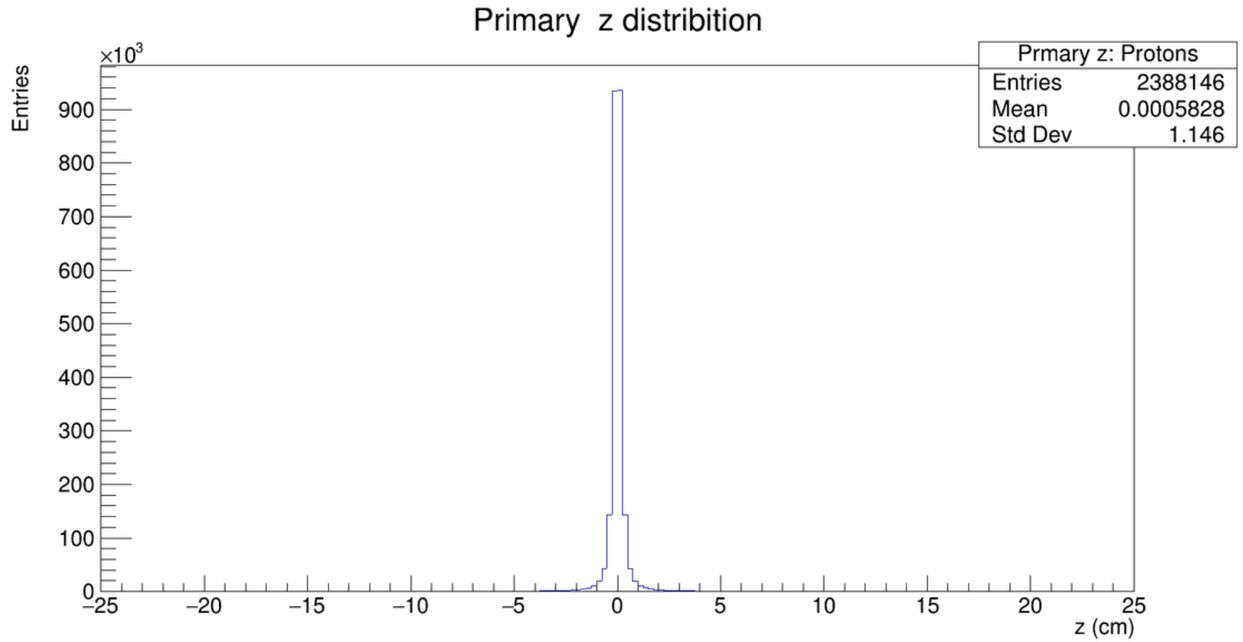


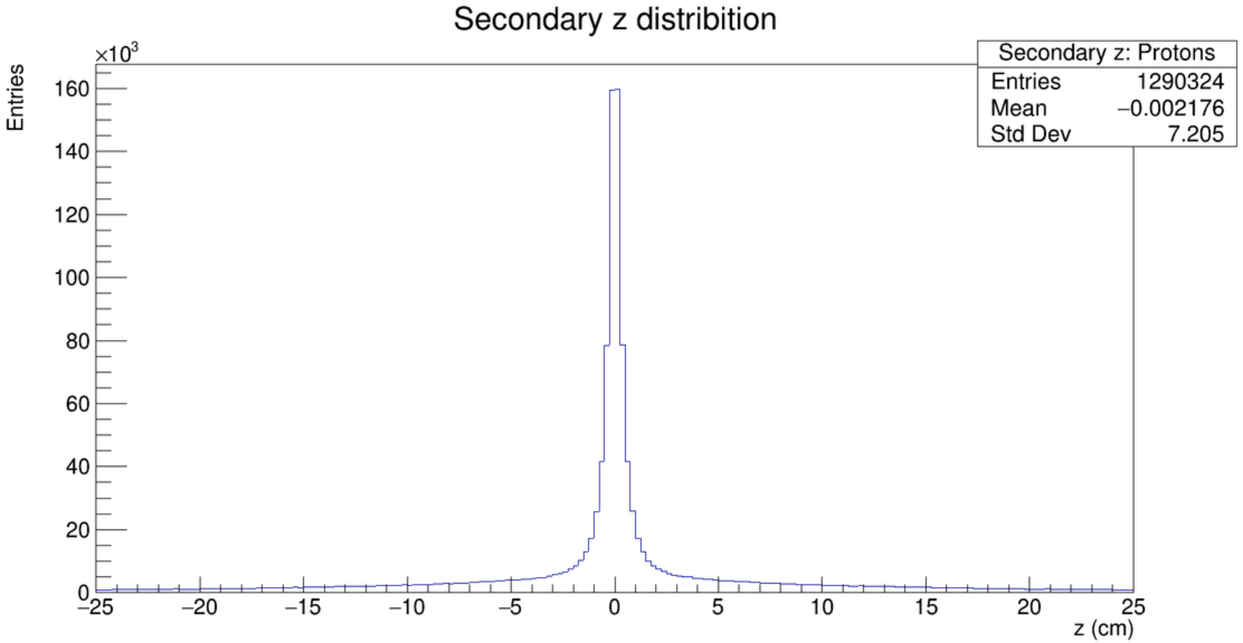
Percentage Deuterons

All	100__%	3 678 470
Primary	64.92__%	2 388 146
Secondary	35.08__%	1 290 324

Protons on the axis-z while function of DCAGlobalZ



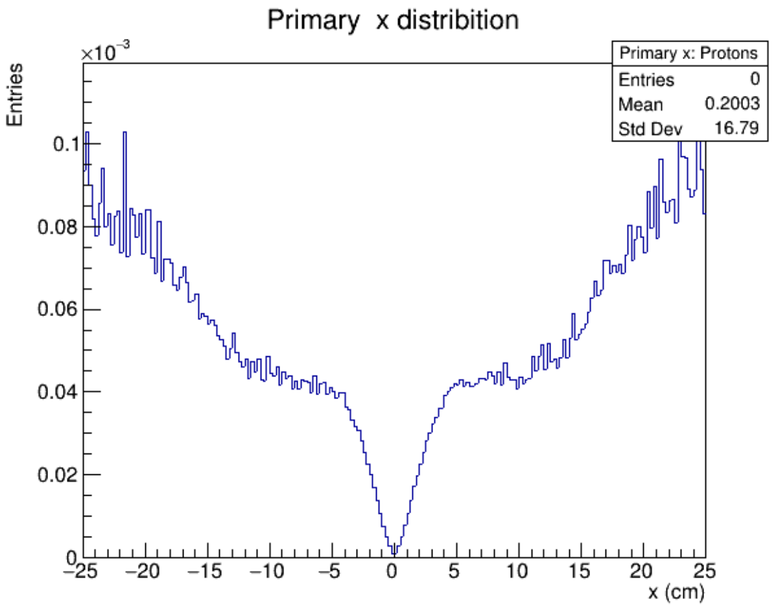


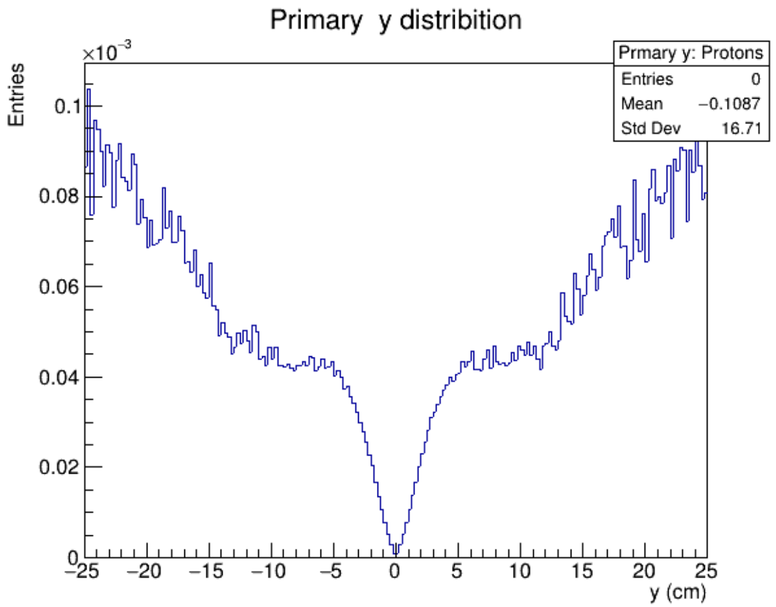


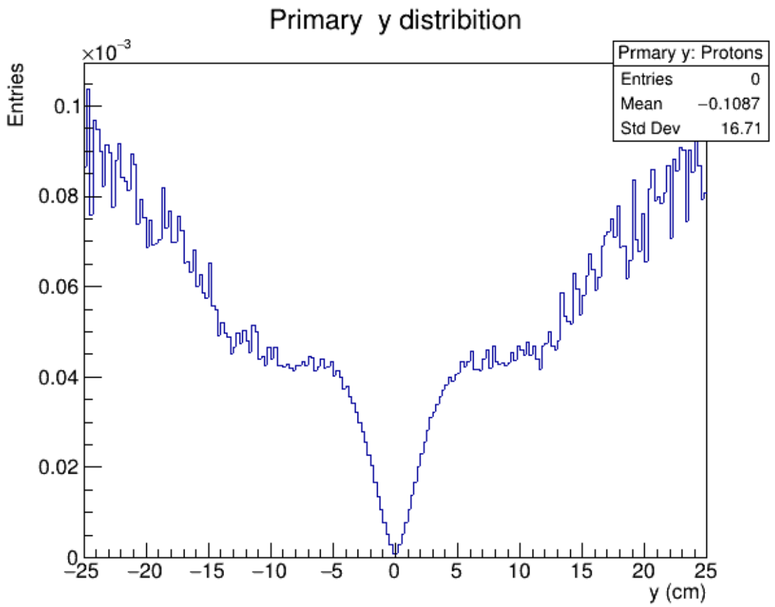
Percentage Deuterons

All	100__%	3 678 470
Primary	64.92__%	2 388 146
Secondary	35.08__%	1 290 324

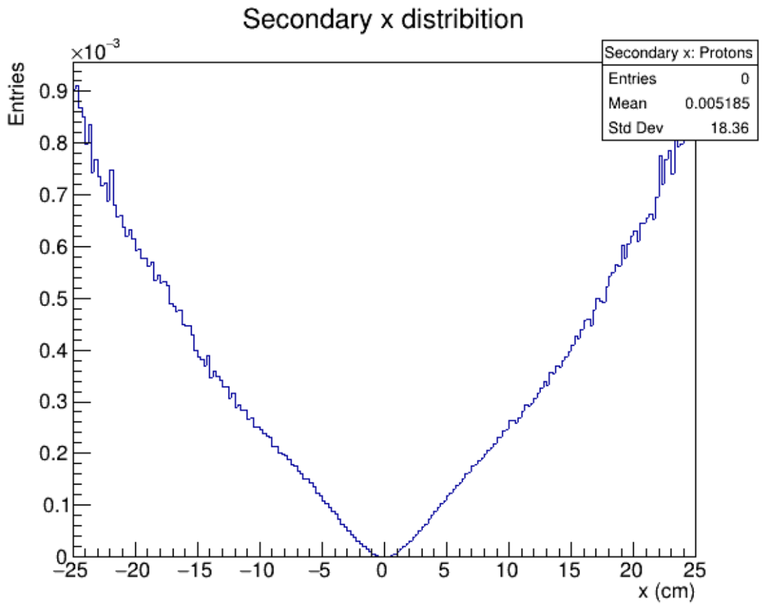
Ratios of primary particles between all particles on the three directions

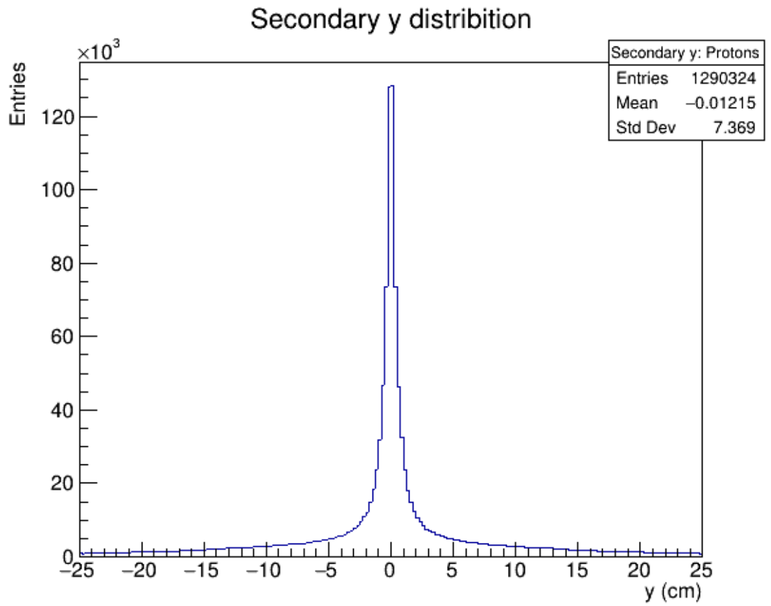


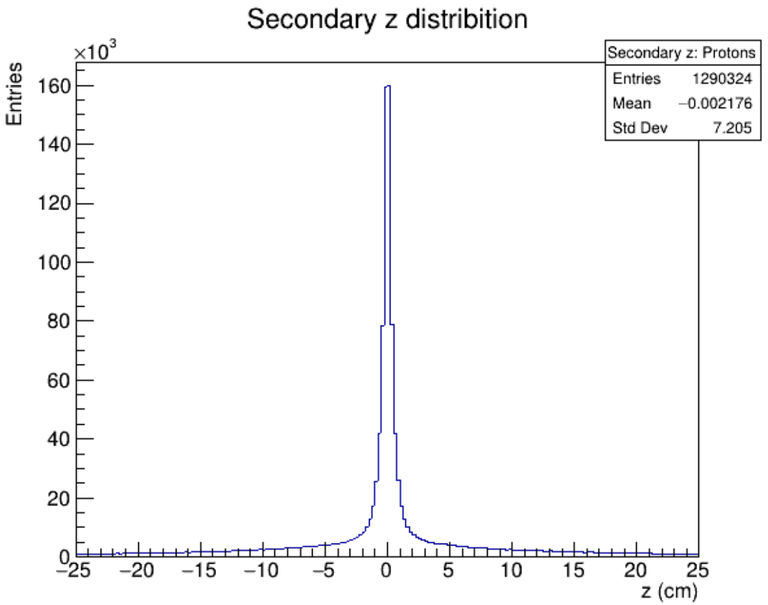




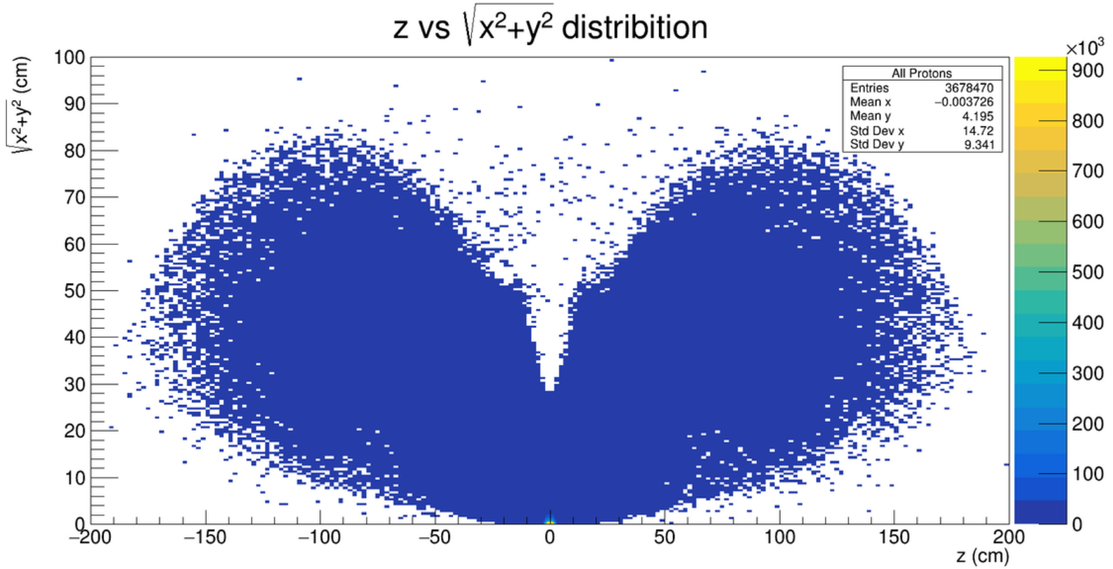
Ratios of secondary particles between all particles on the three directions

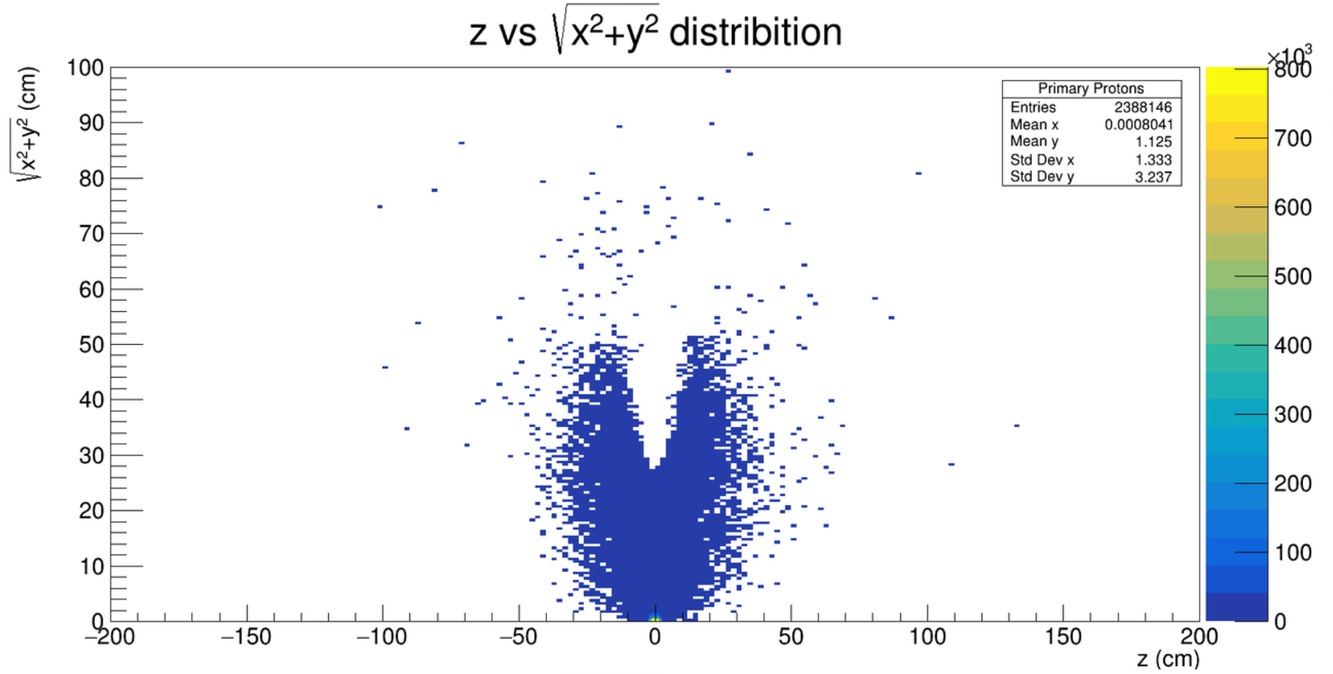


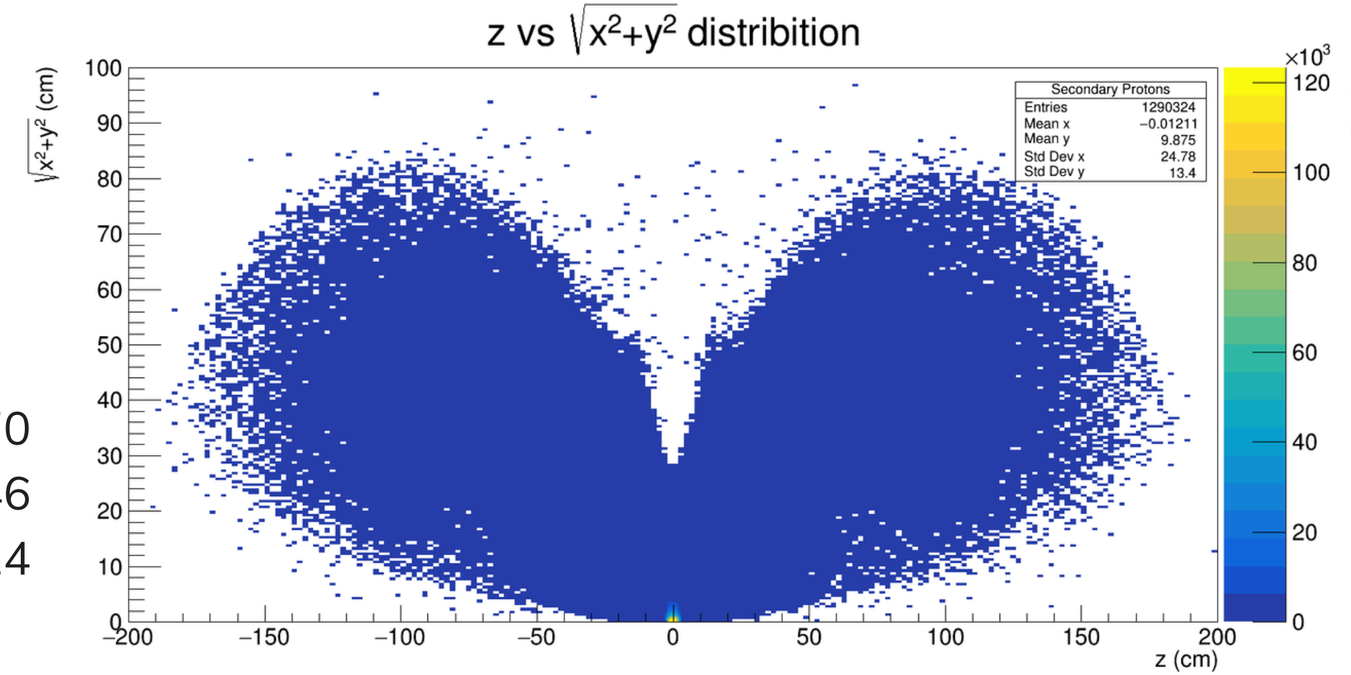




Distribution of Protons en z vs radius while function of DCAGlobal





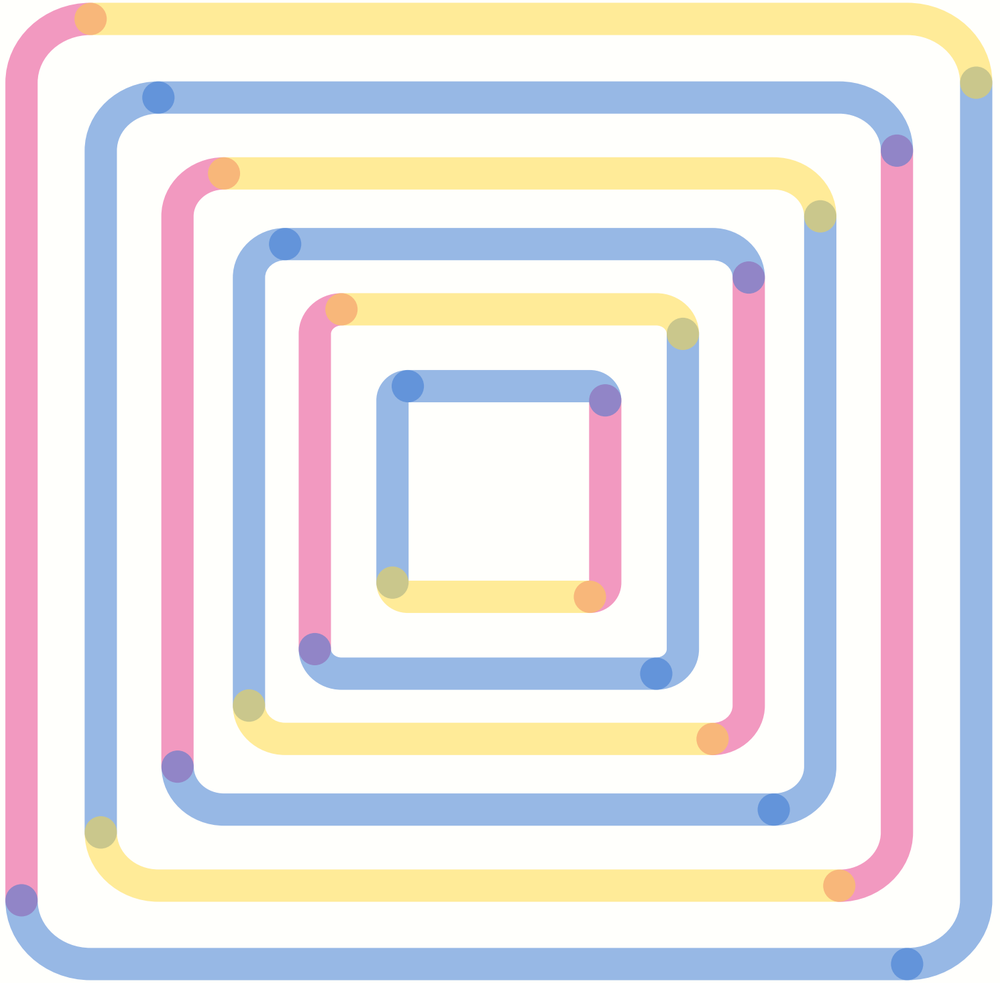


Percentage Deuterons

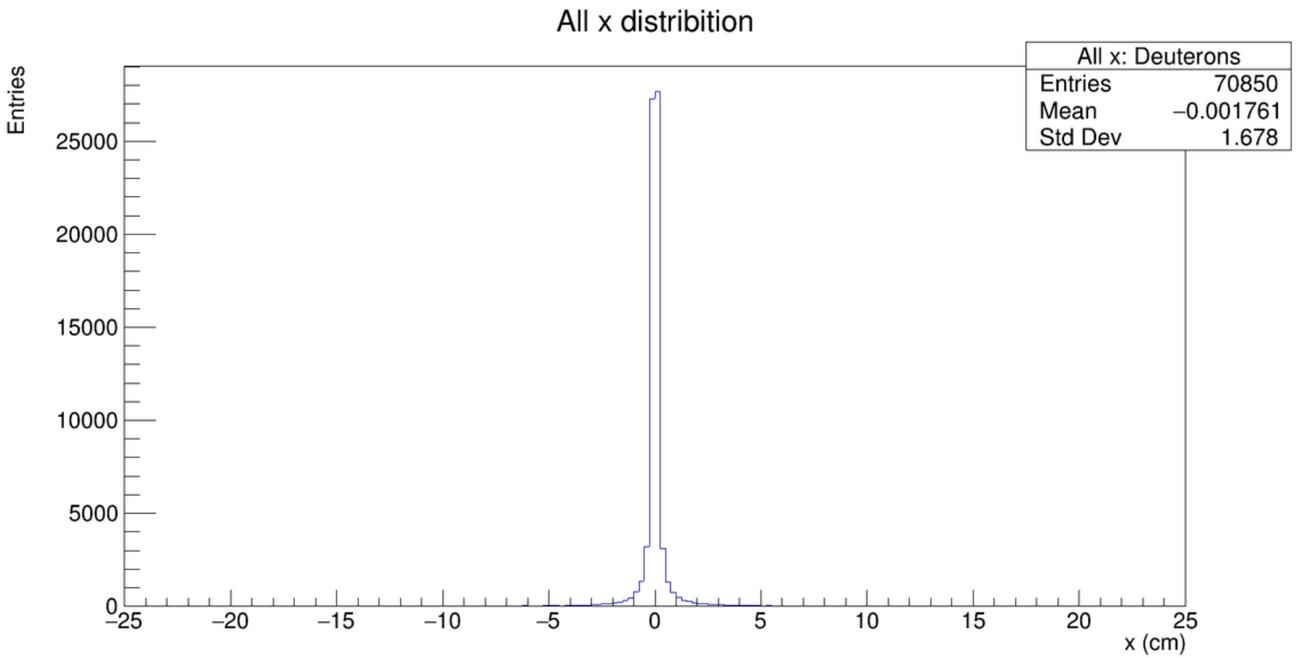
All	100__%	3 678 470
Primary	64.92__%	2 388 146
Secondary	35.08__%	1 290 324

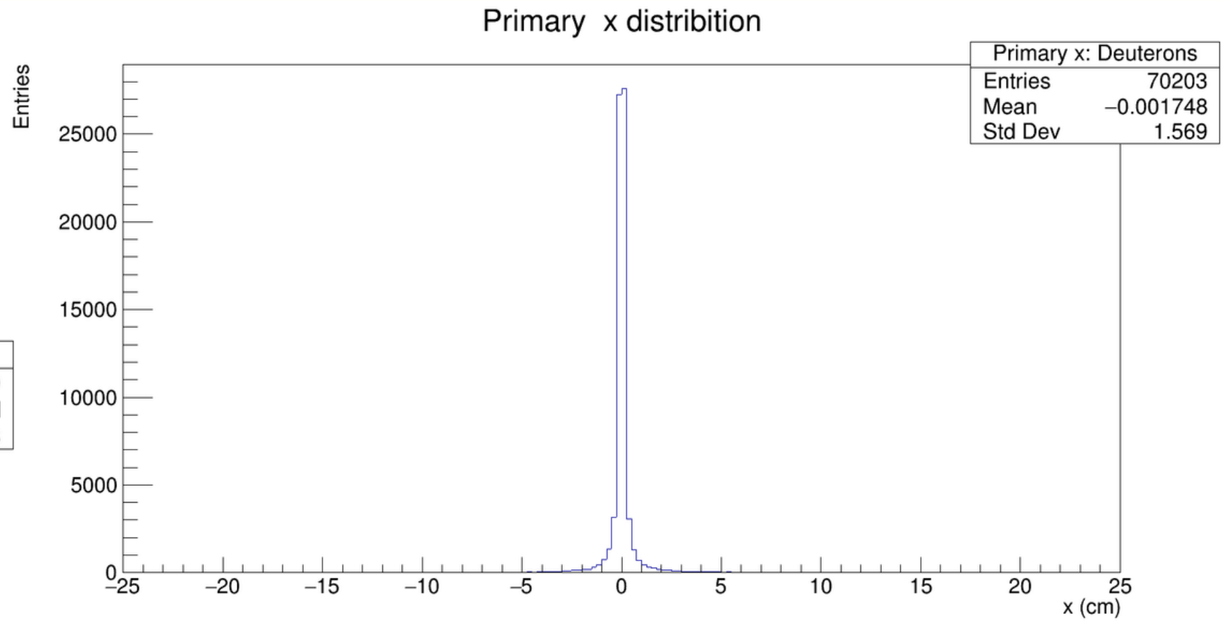
Data with the generator BOX

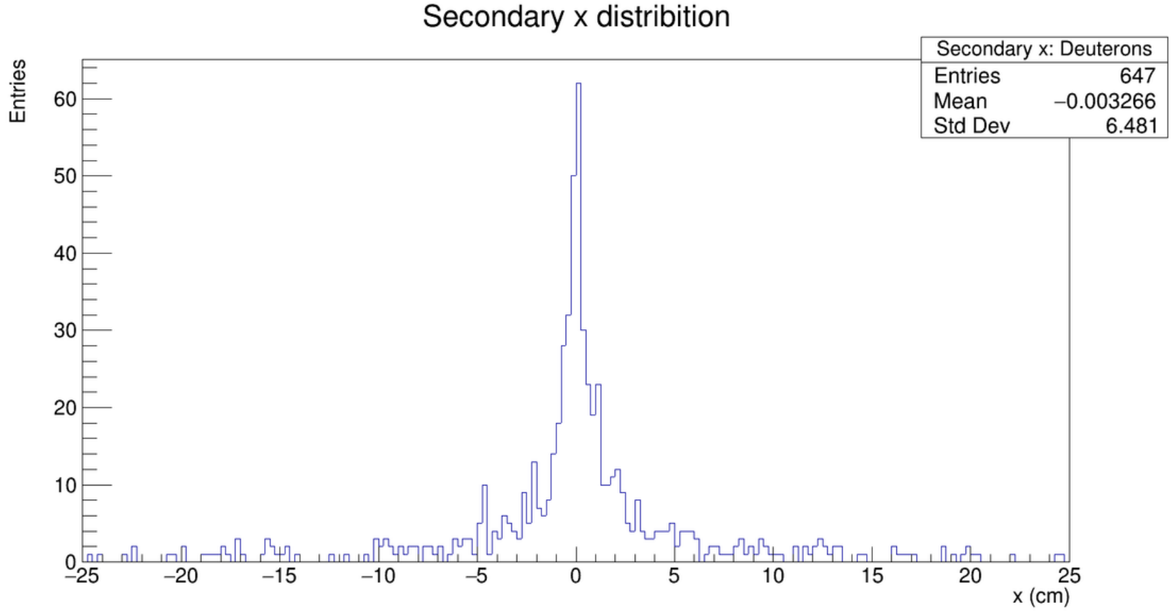
100,000 events



Deuterons with DCAGlobalX



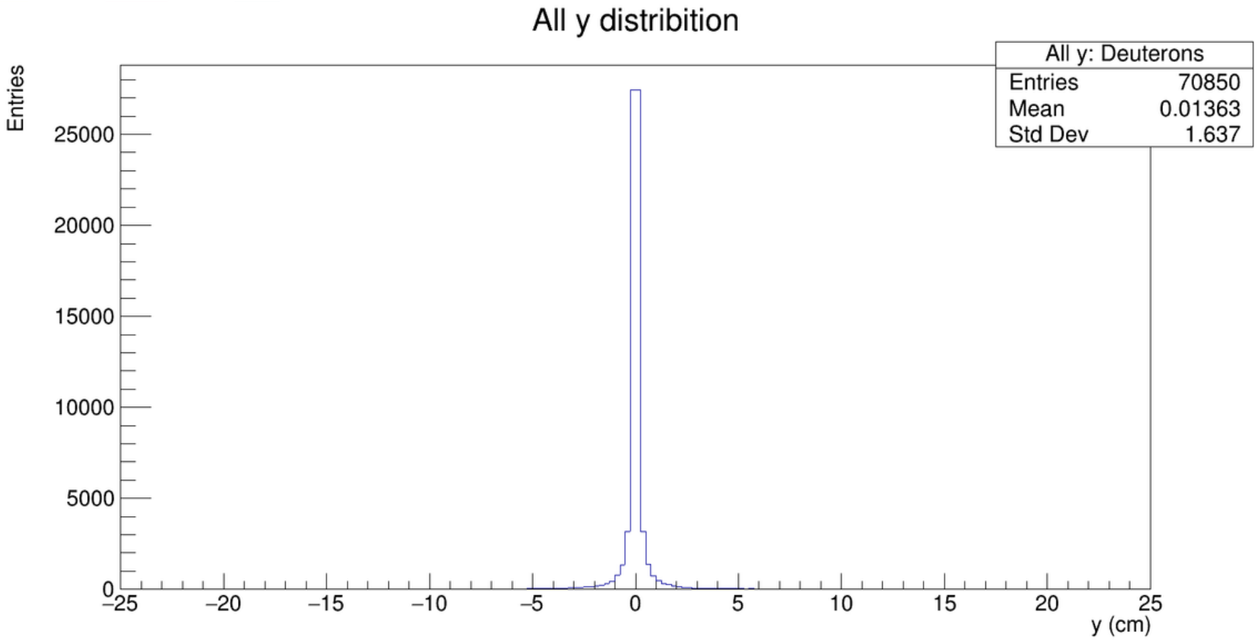


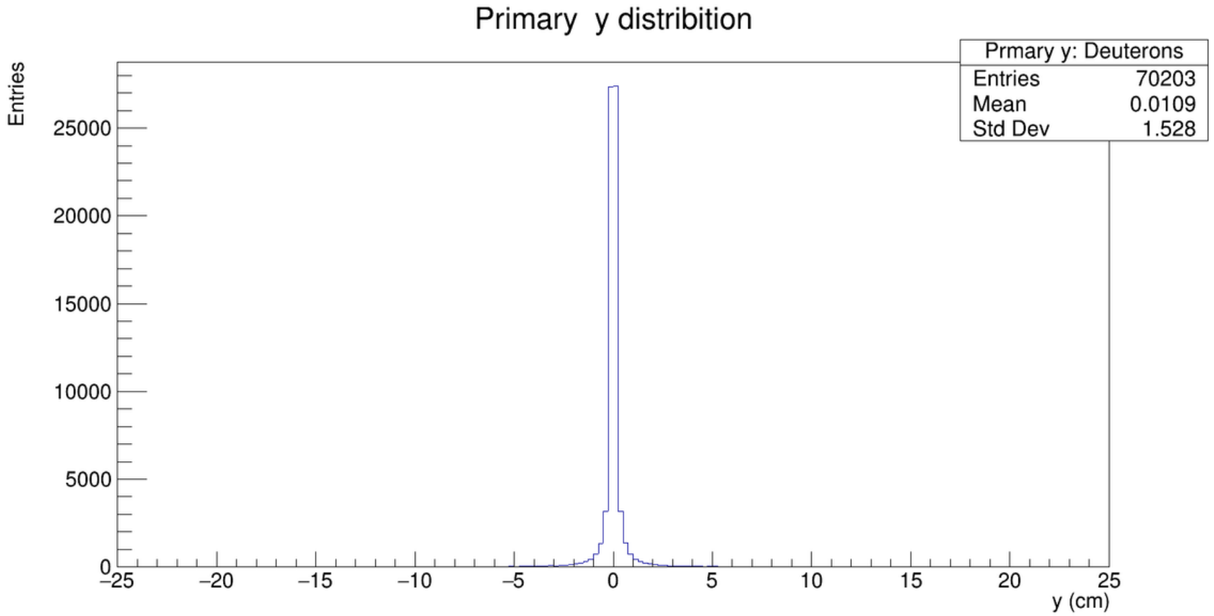


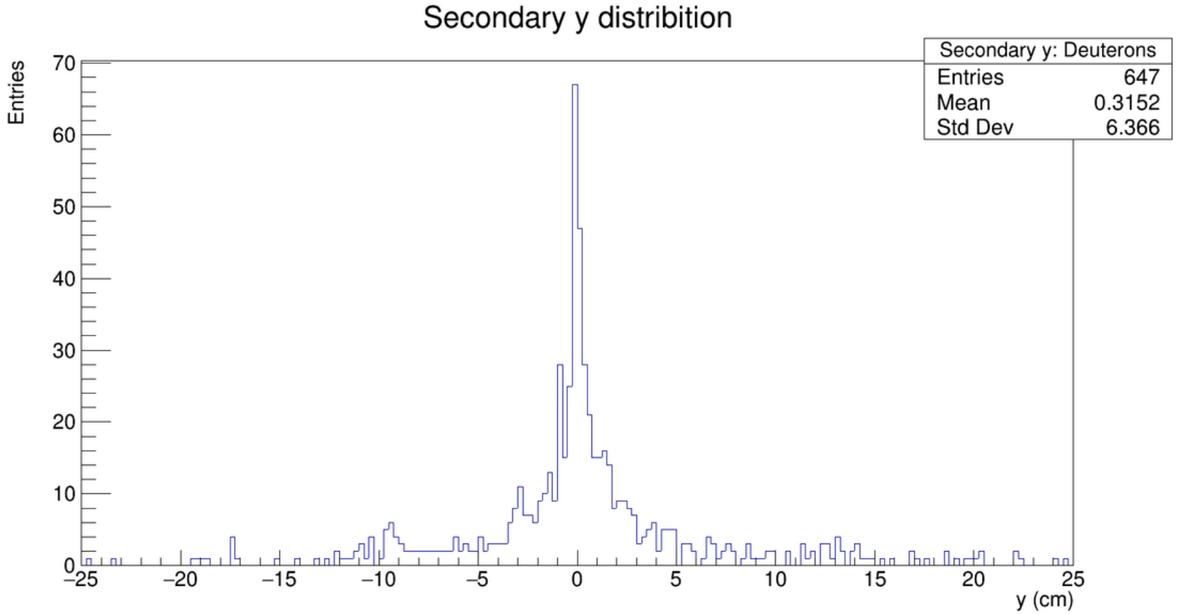
Percentage Deuterons

All	100__%	70 850
Primary	99.09__%	70 203
Secondary	0.91__%	647

Deuterons with DCAGlobalY



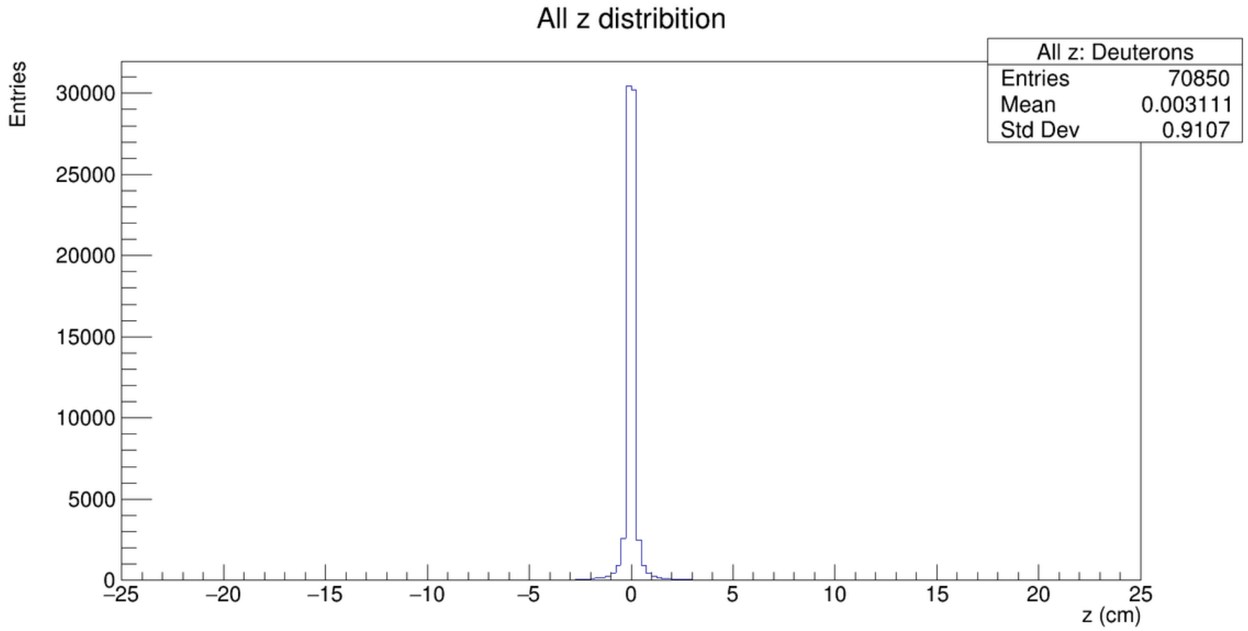


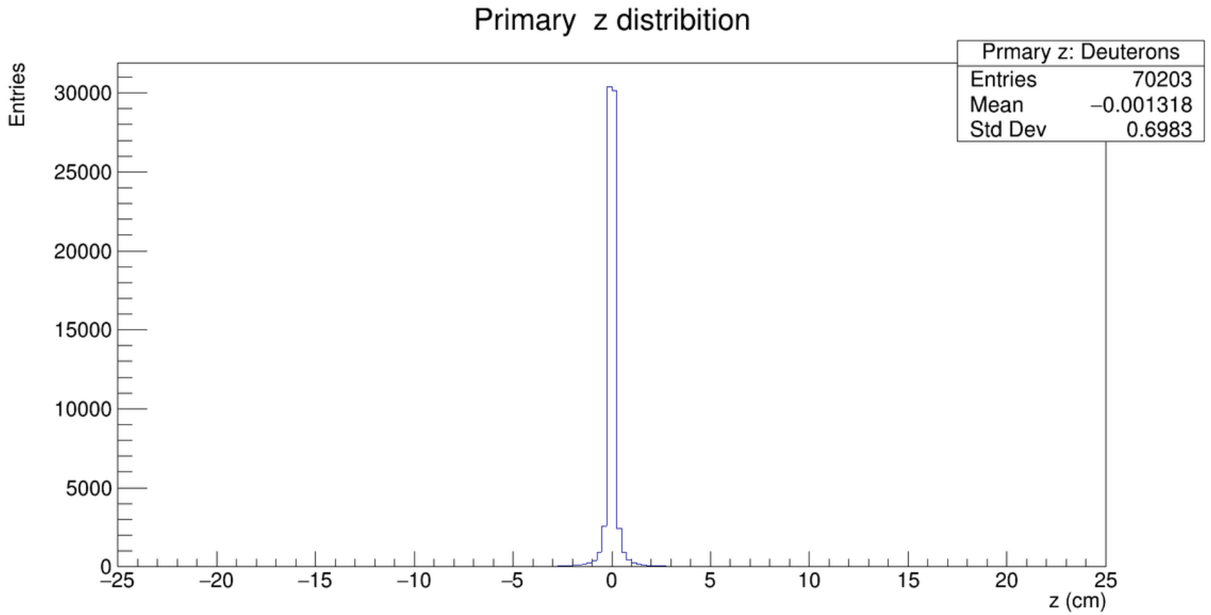


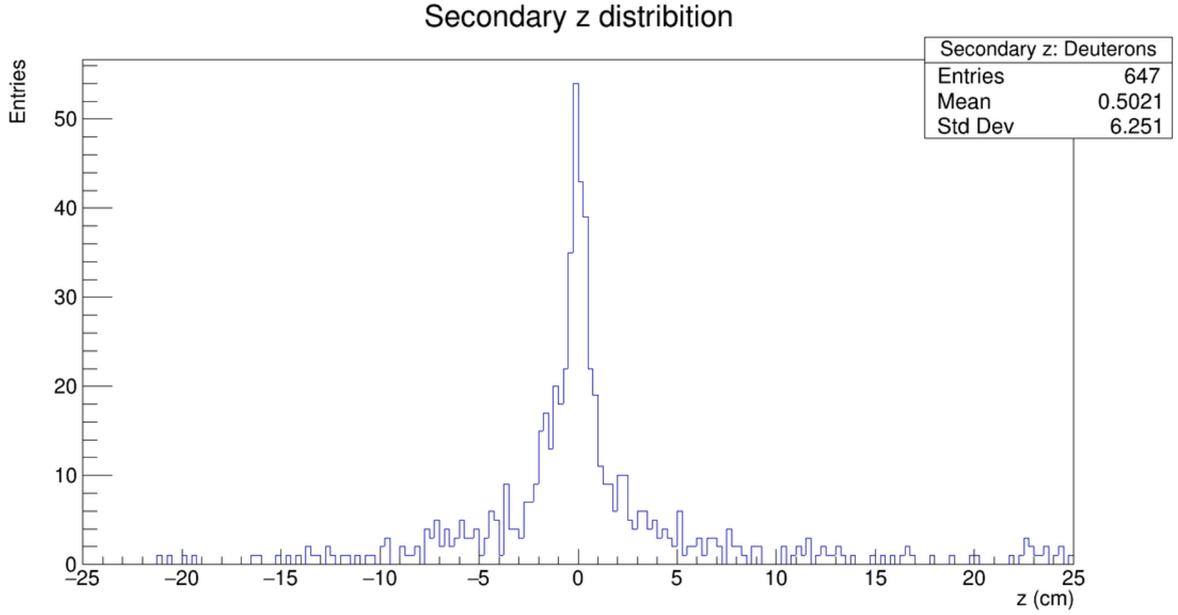
Percentage Deuterons

All	100__%	70 850
Primary	99.09__%	70 203
Secondary	0.91__%	647

Deuterons with DCAGlobalZ



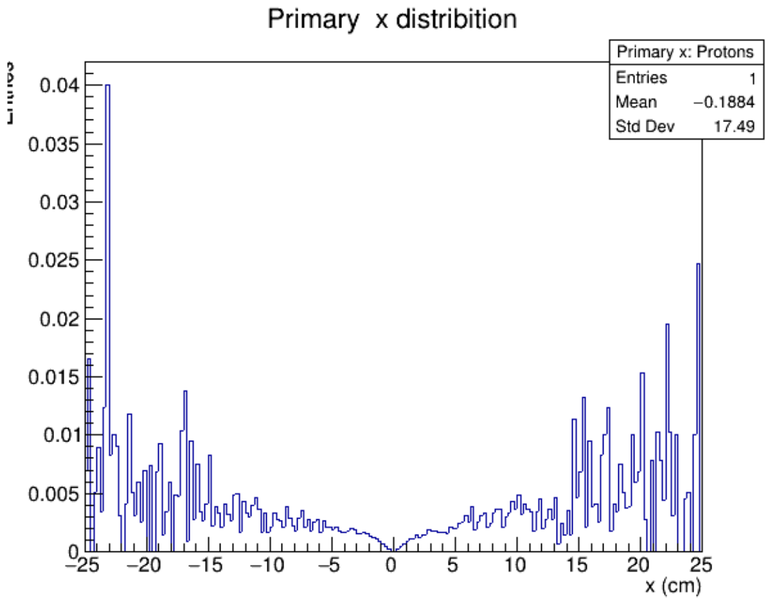


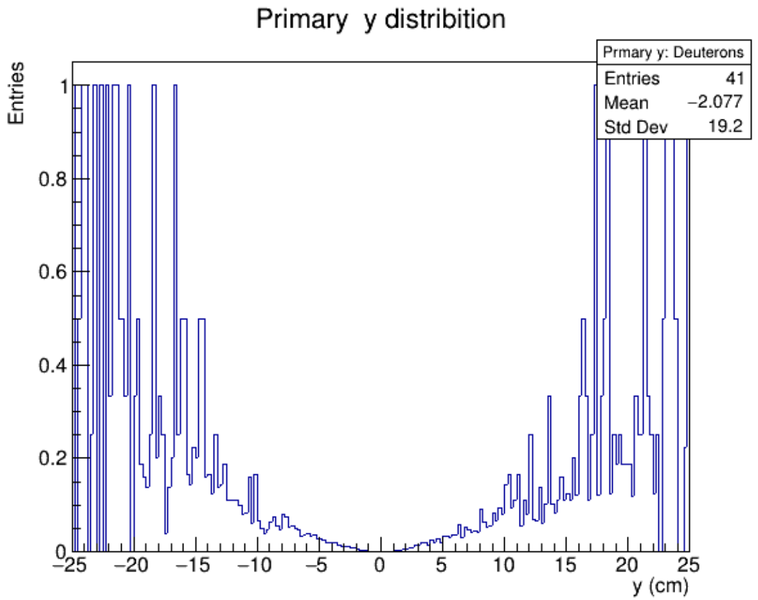


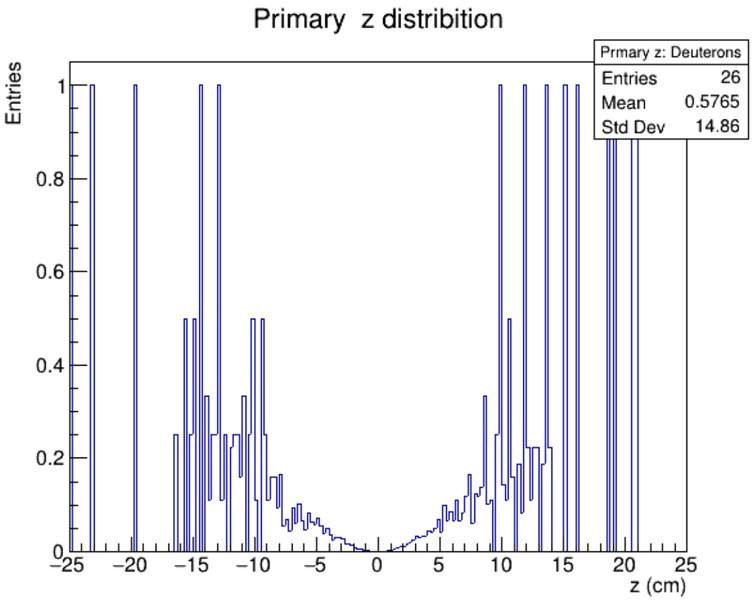
Percentage Deuterons

All	100__%	70 850
Primary	99.09__%	70 203
Secondary	0.91__%	647

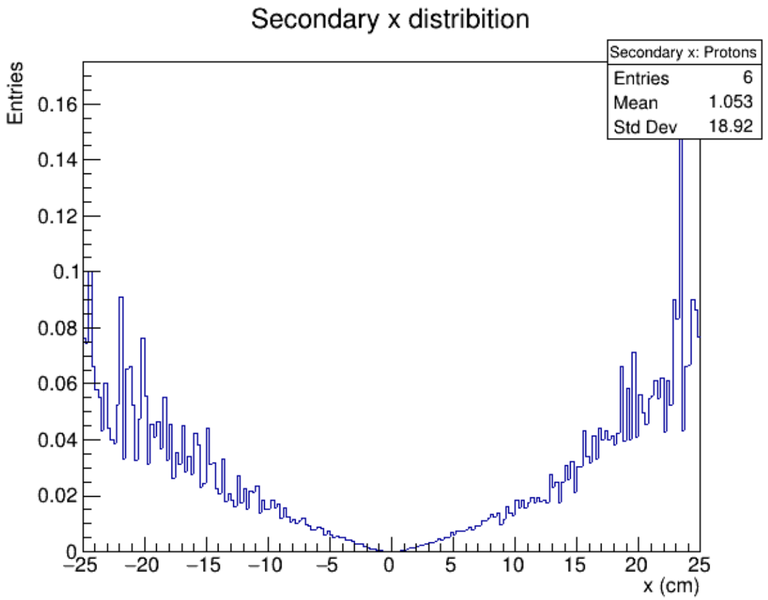
Ratios of primary particles between all particles on the three directions

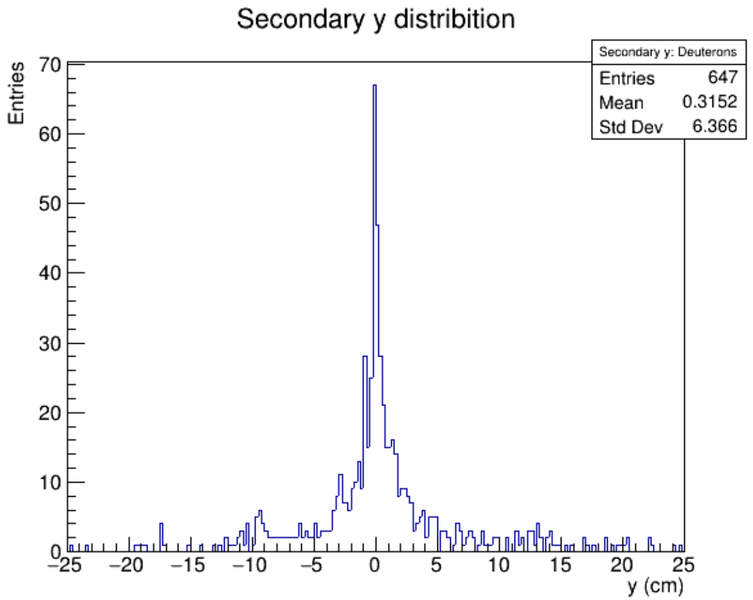


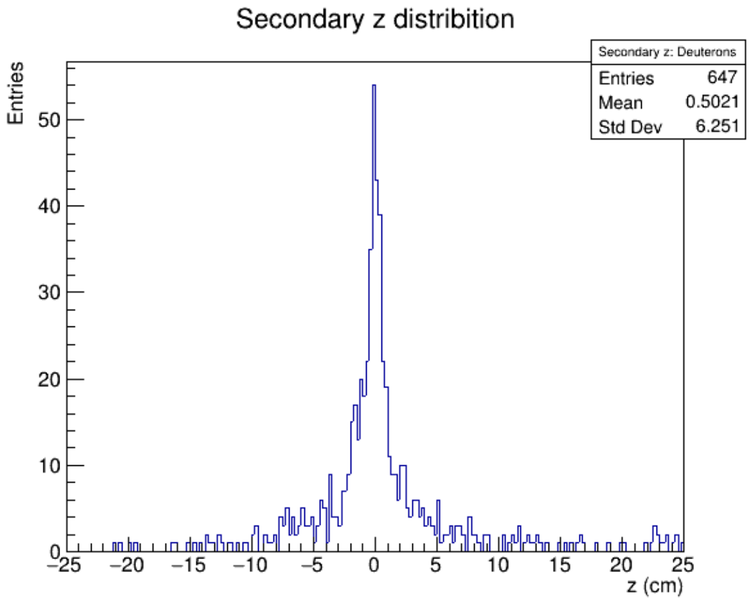




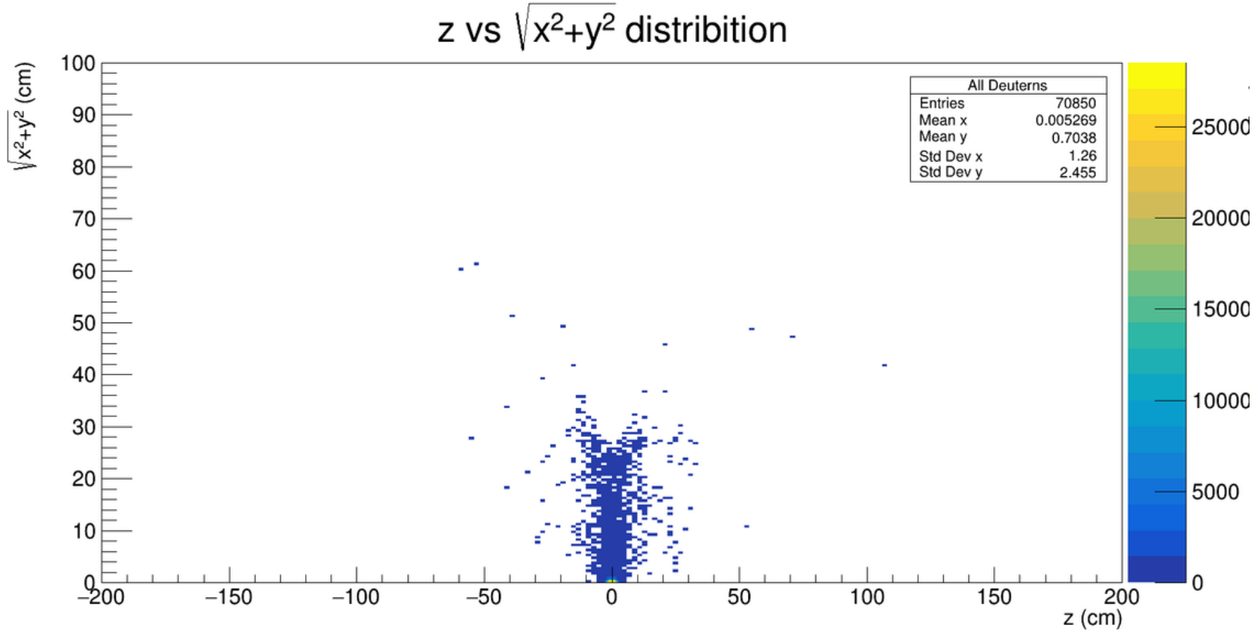
Ratios of secondary particles between all particles on the three directions

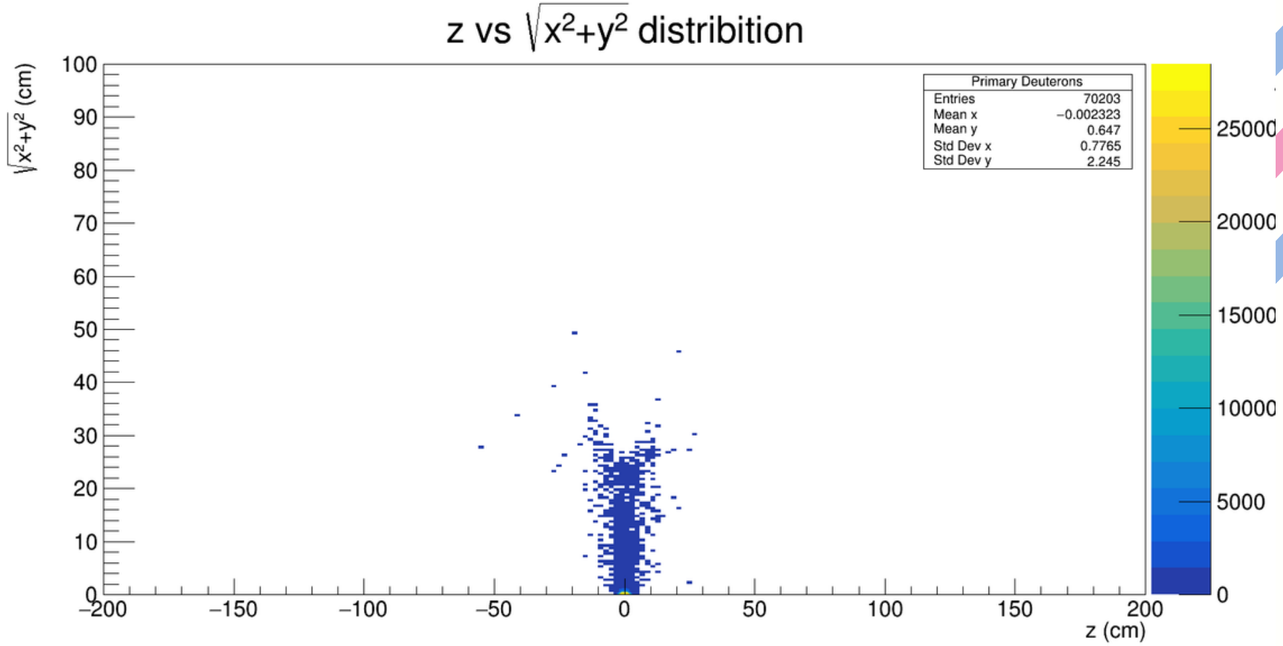


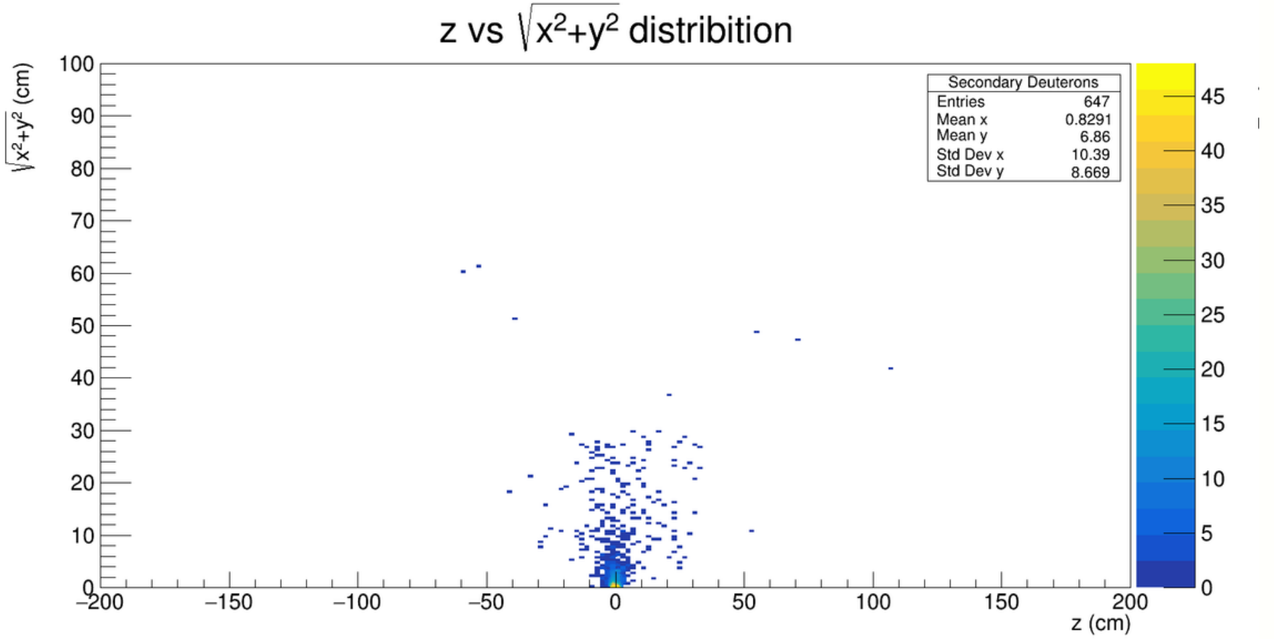




Distribution of Deuterons en z vs radius while function of DCAGlobal

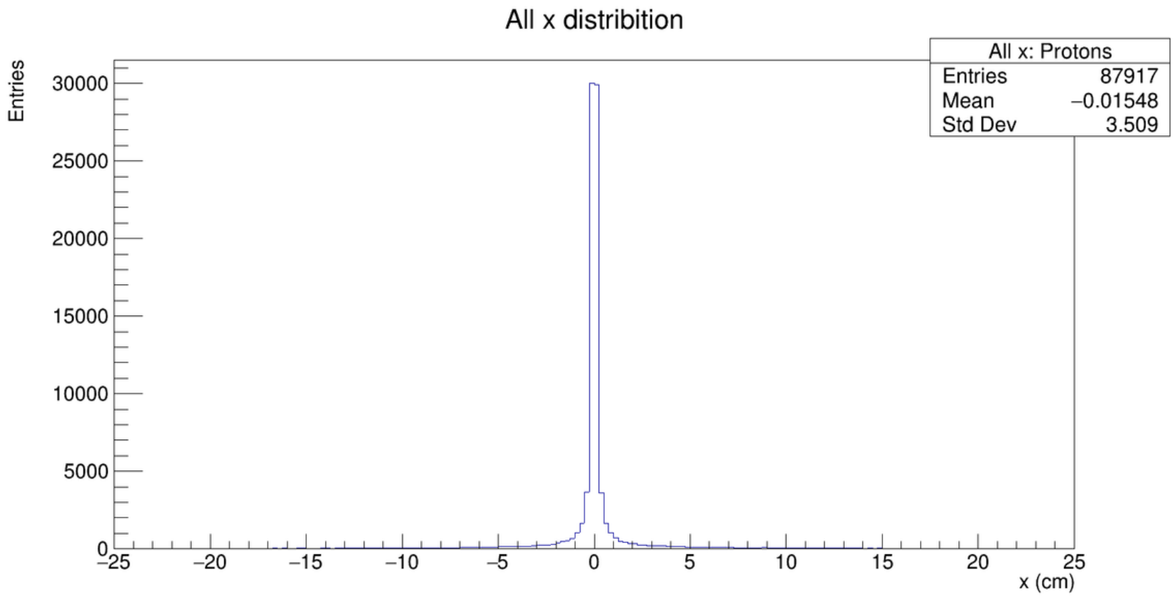






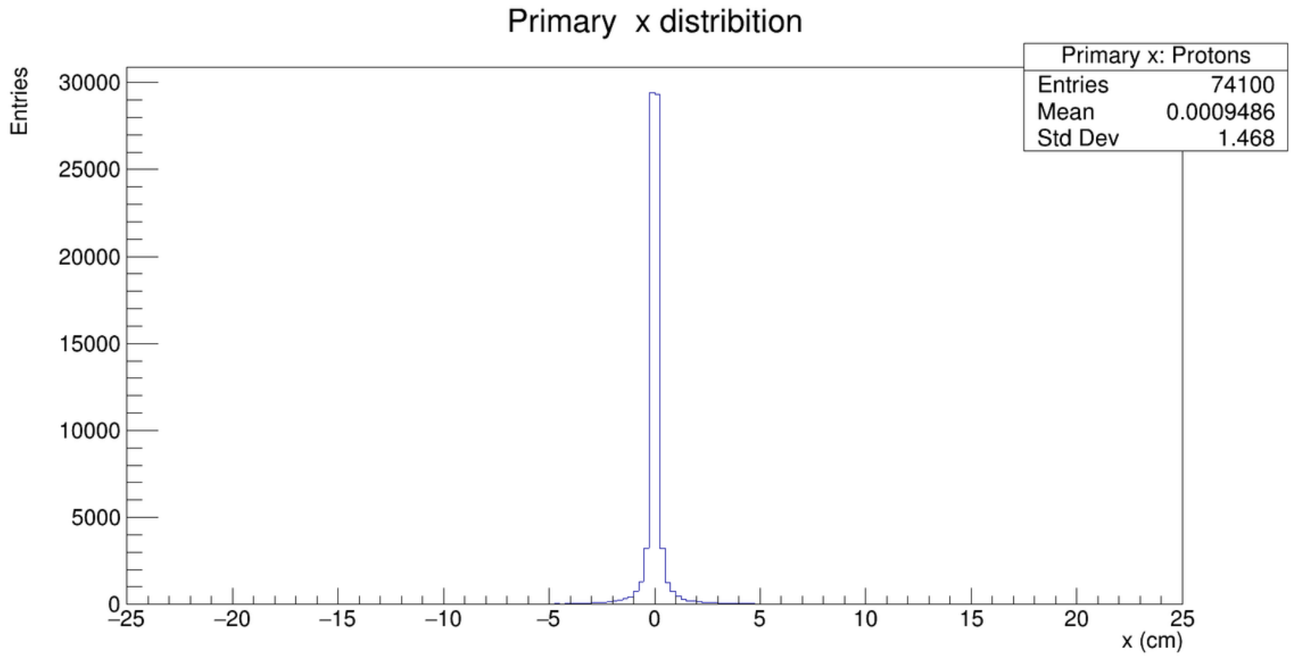
Percentage Deuterons		
All	100__%	70 850
Primary	99.09__%	70 203
Secondary	0.91__%	647

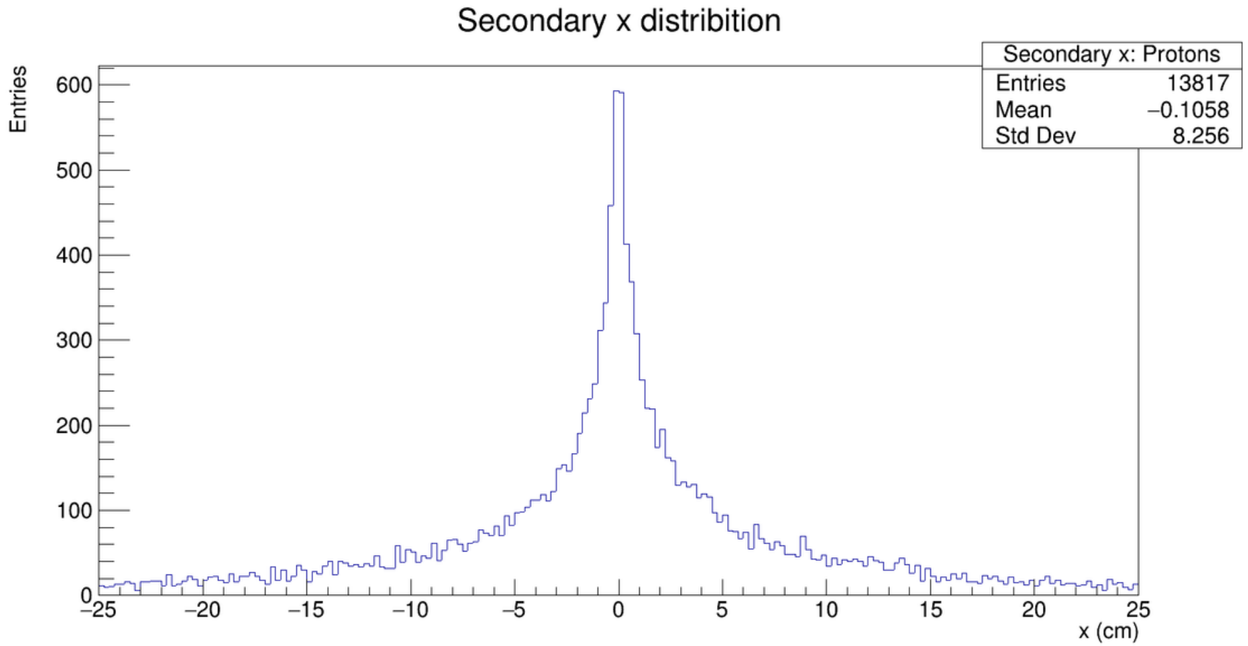
Protons on the axis-x while function of DCAGlobalX



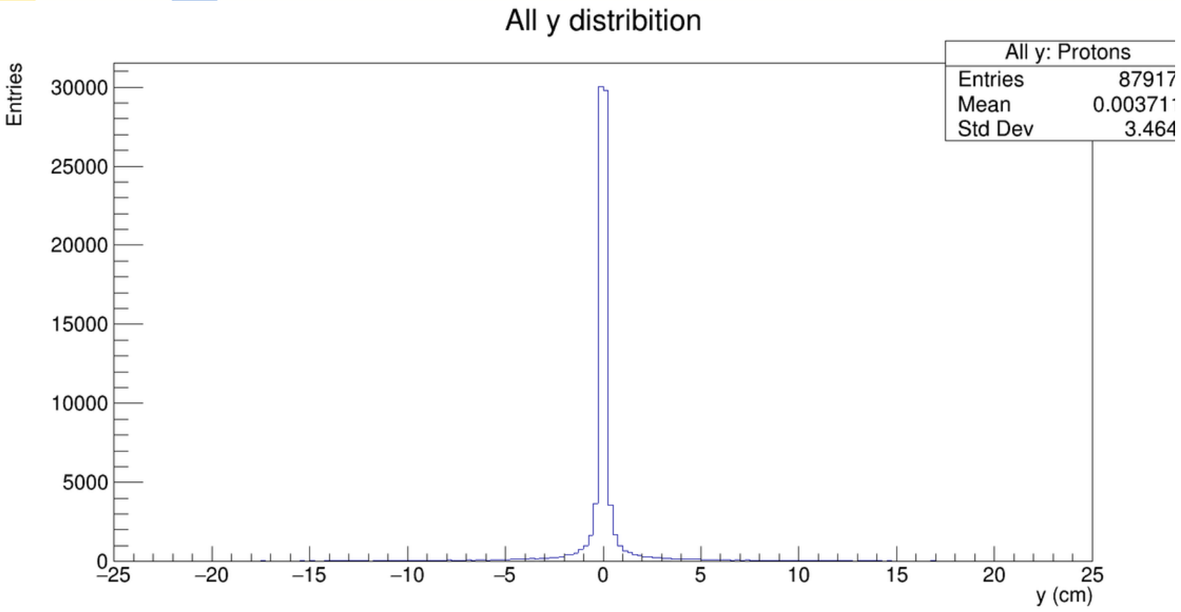
Percentage Deuterons

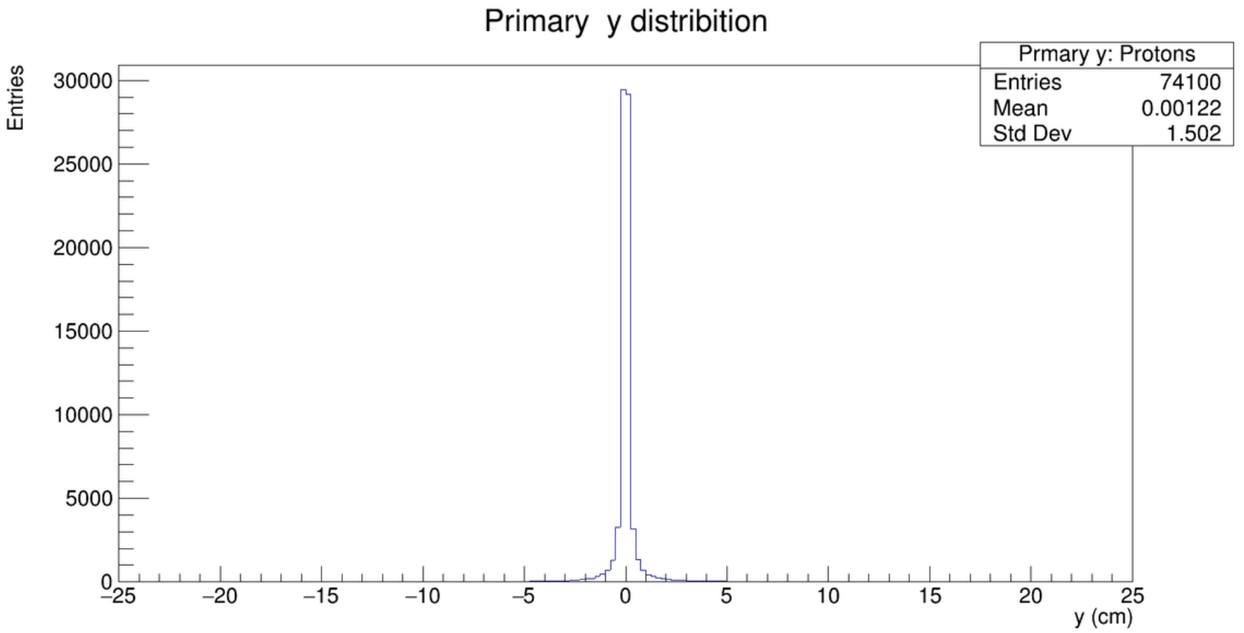
All	100__%	87 917
Primary	84.28__%	74 100
Secondary	15.72__%	13 817

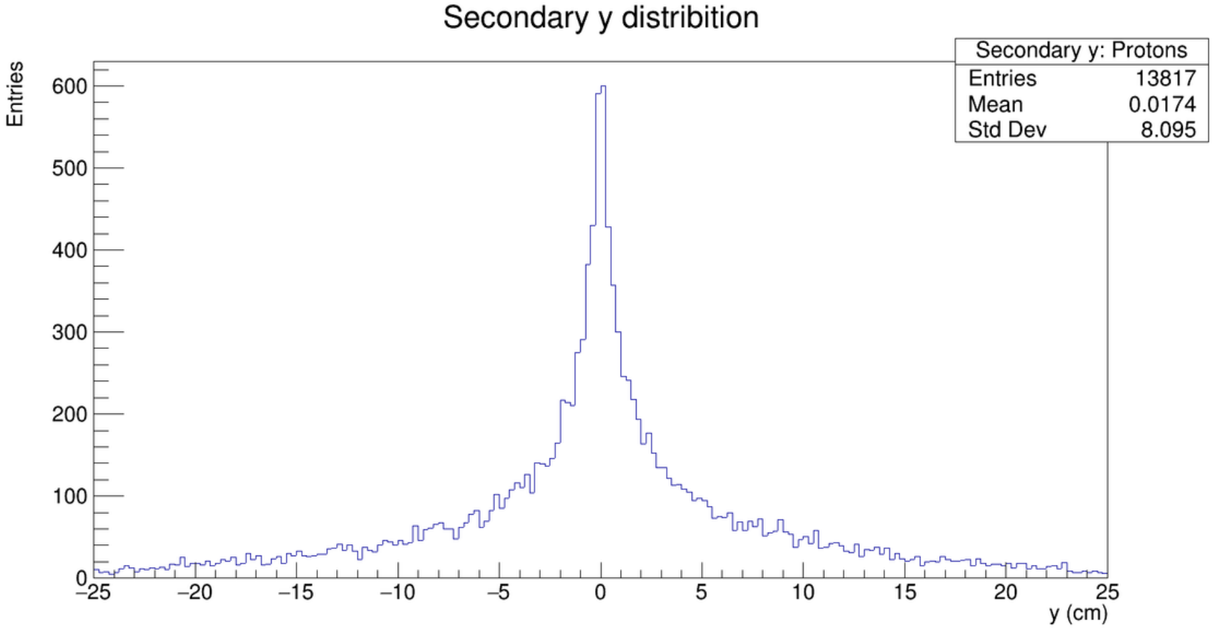




Protons on the axis-y while function of DCAGlobalY



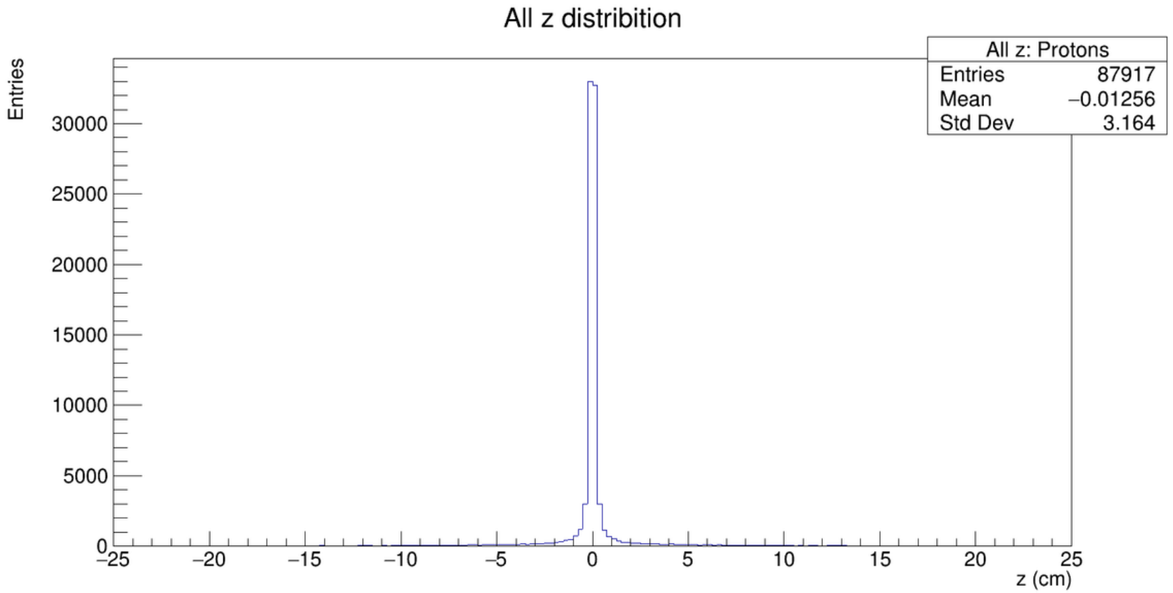


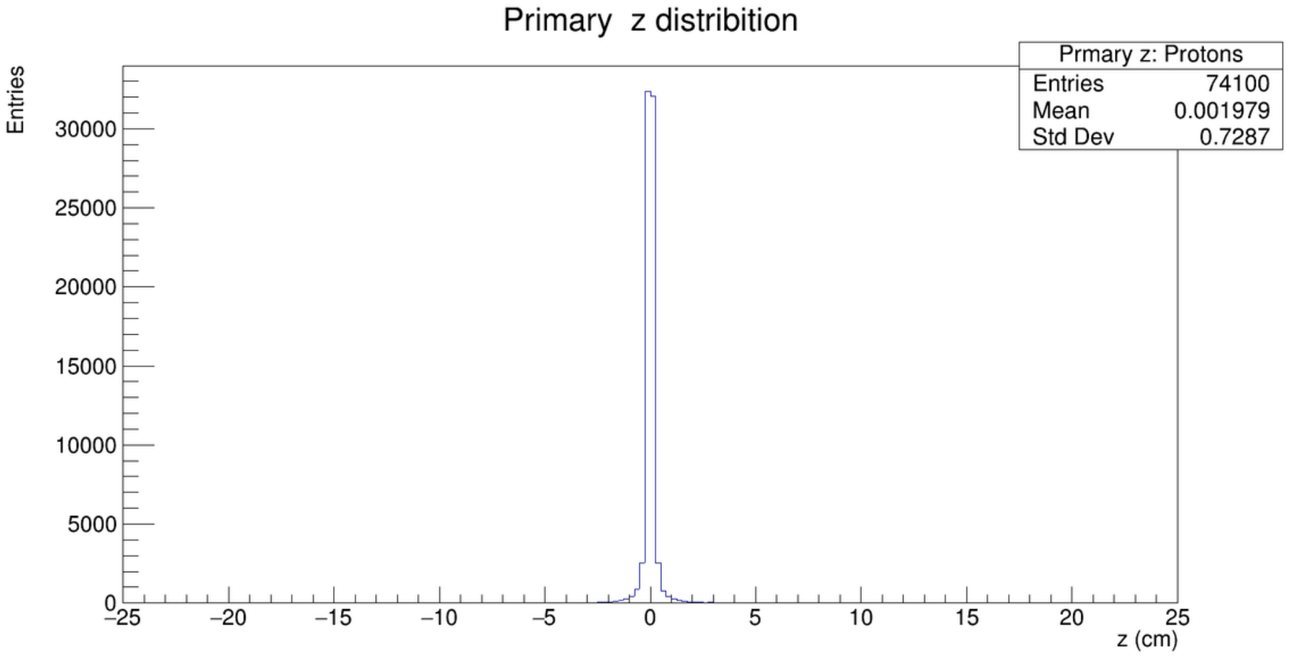


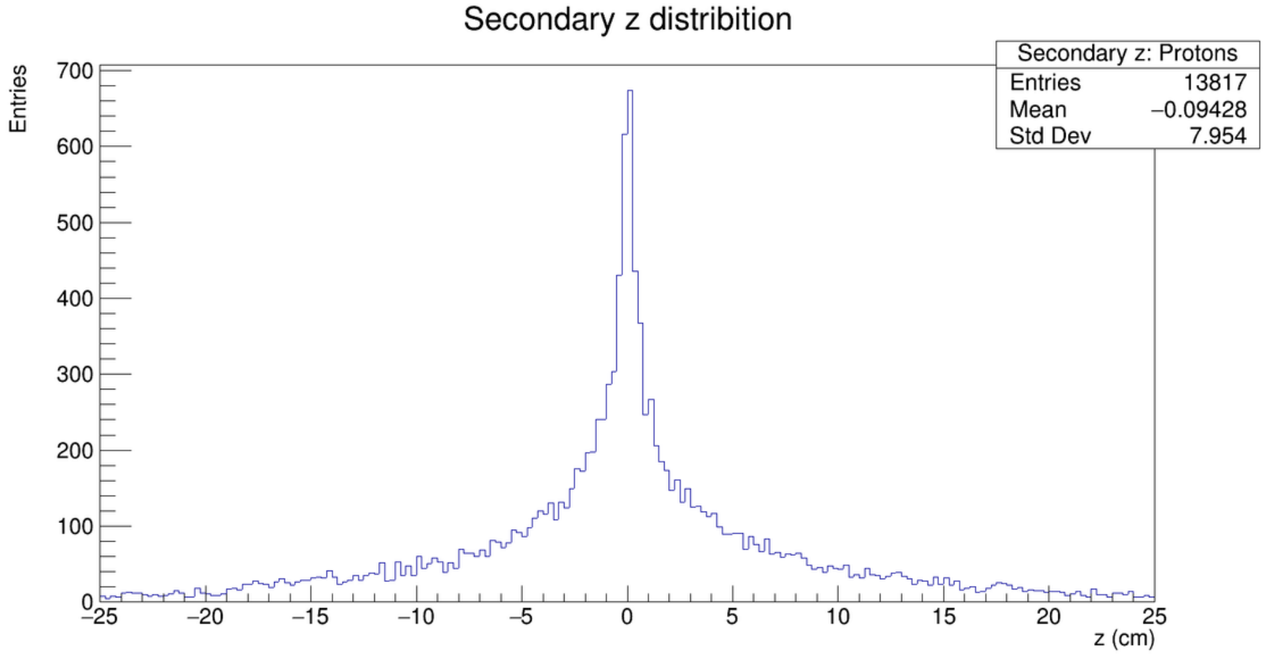
Percentage Deuterons

All	100__%	87 917
Primary	84.28__%	74 100
Secondary	15.72__%	13 817

Protons on the axis-z while function of DCAGlobalZ



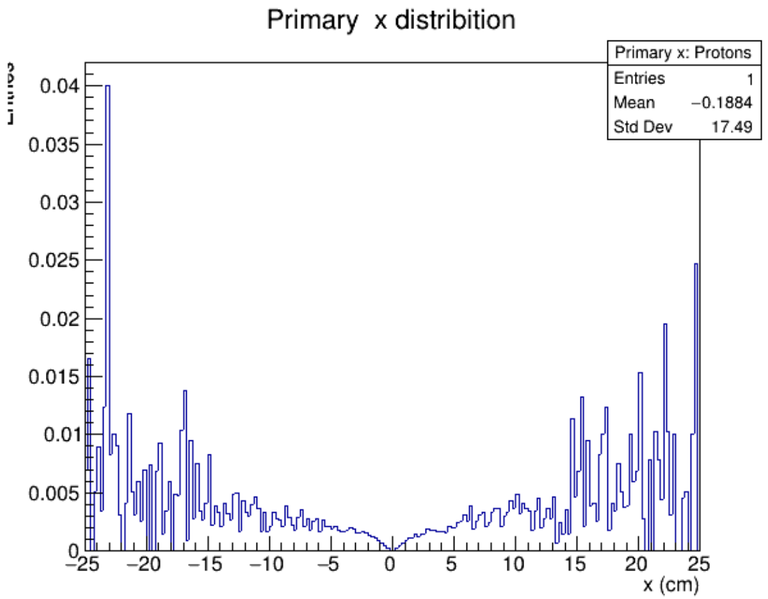


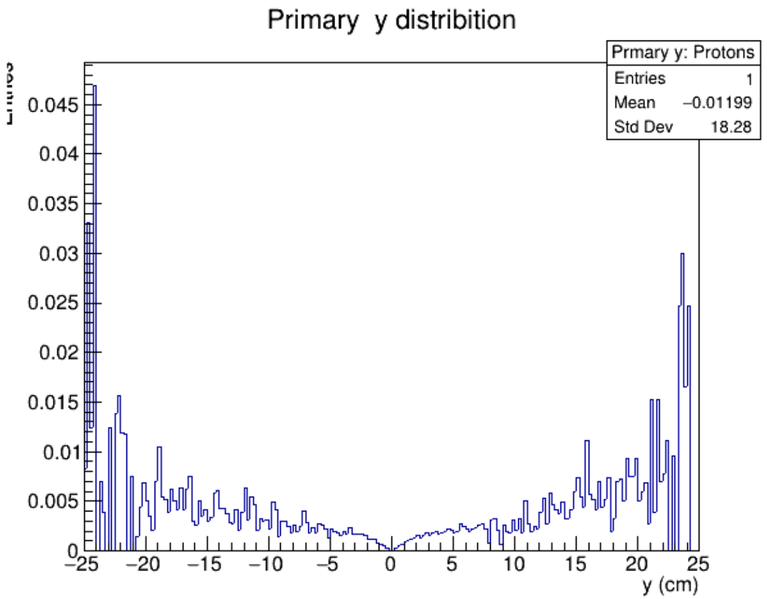


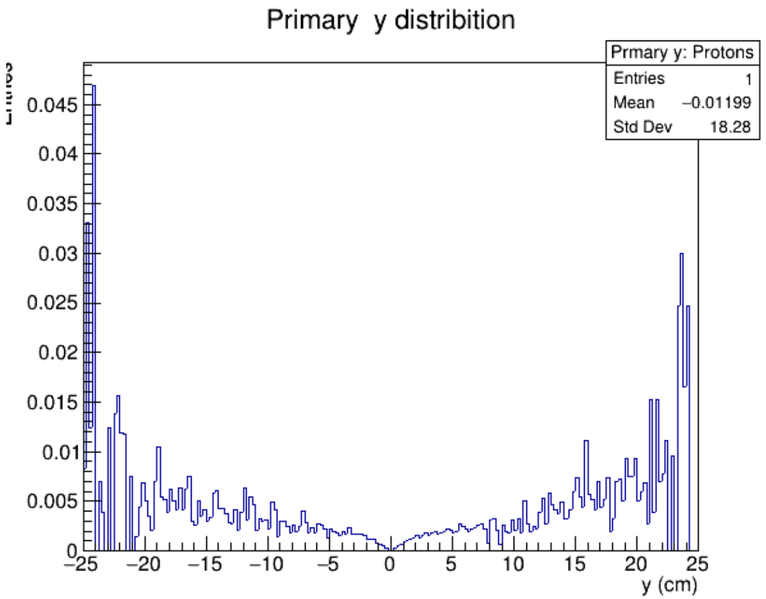
Percentage Deuterons

All	100__%	87 917
Primary	84.28__%	74 100
Secondary	15.72__%	13 817

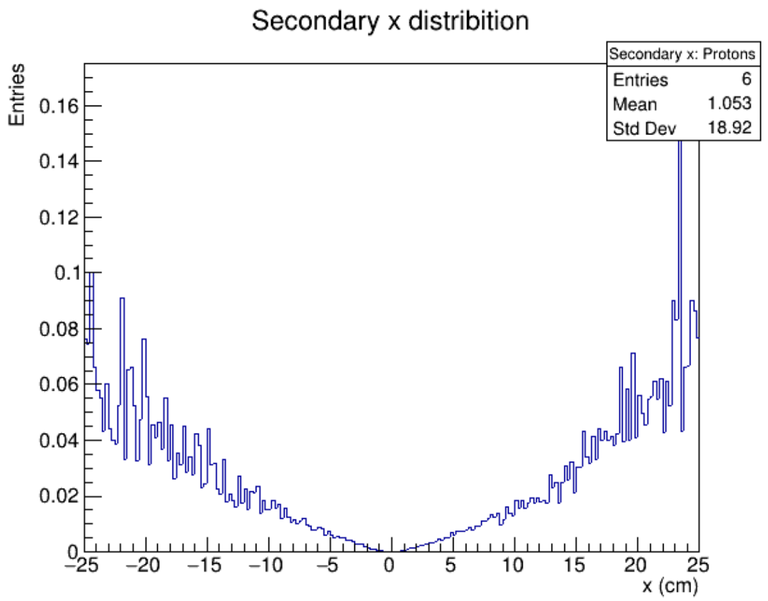
Ratios of primary particles between all particles on the three directions

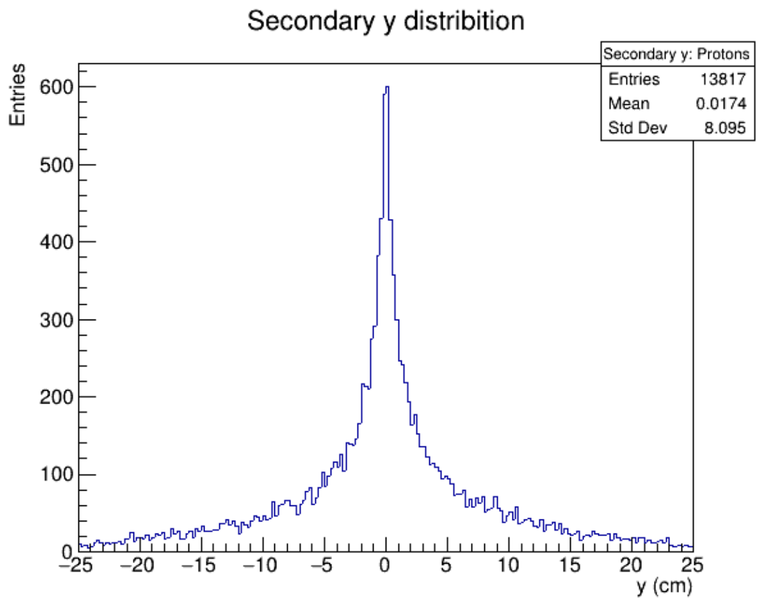


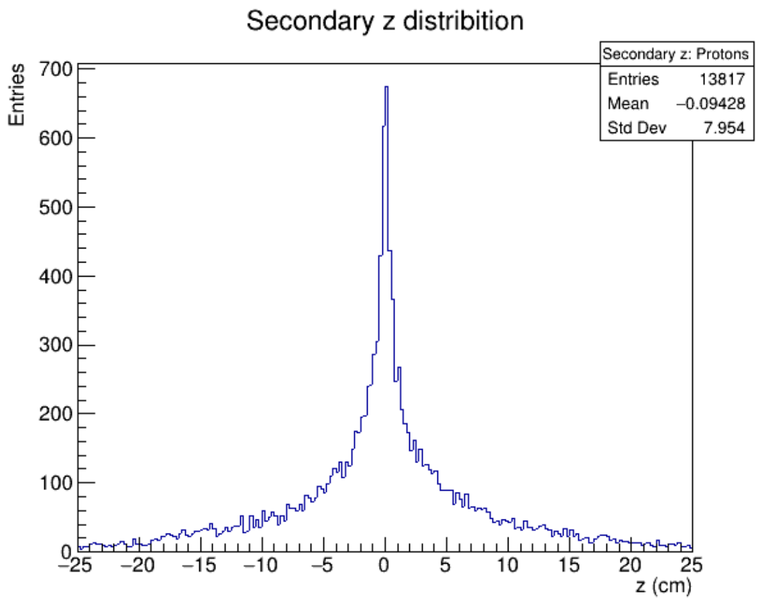




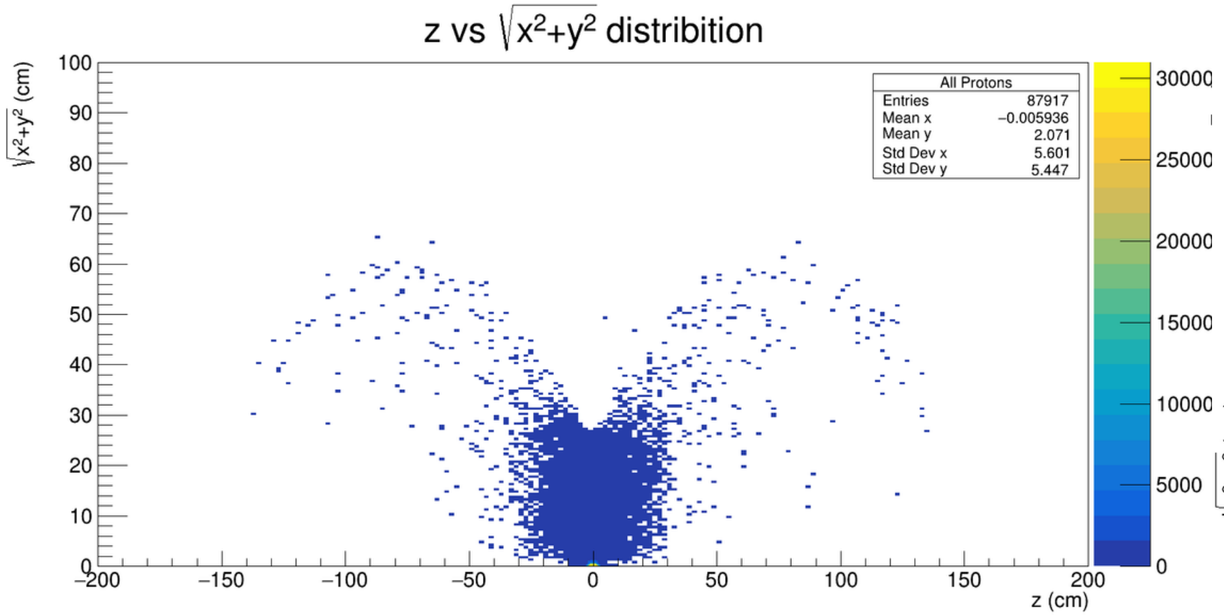
Ratios of secondary particles between all particles on the three directions

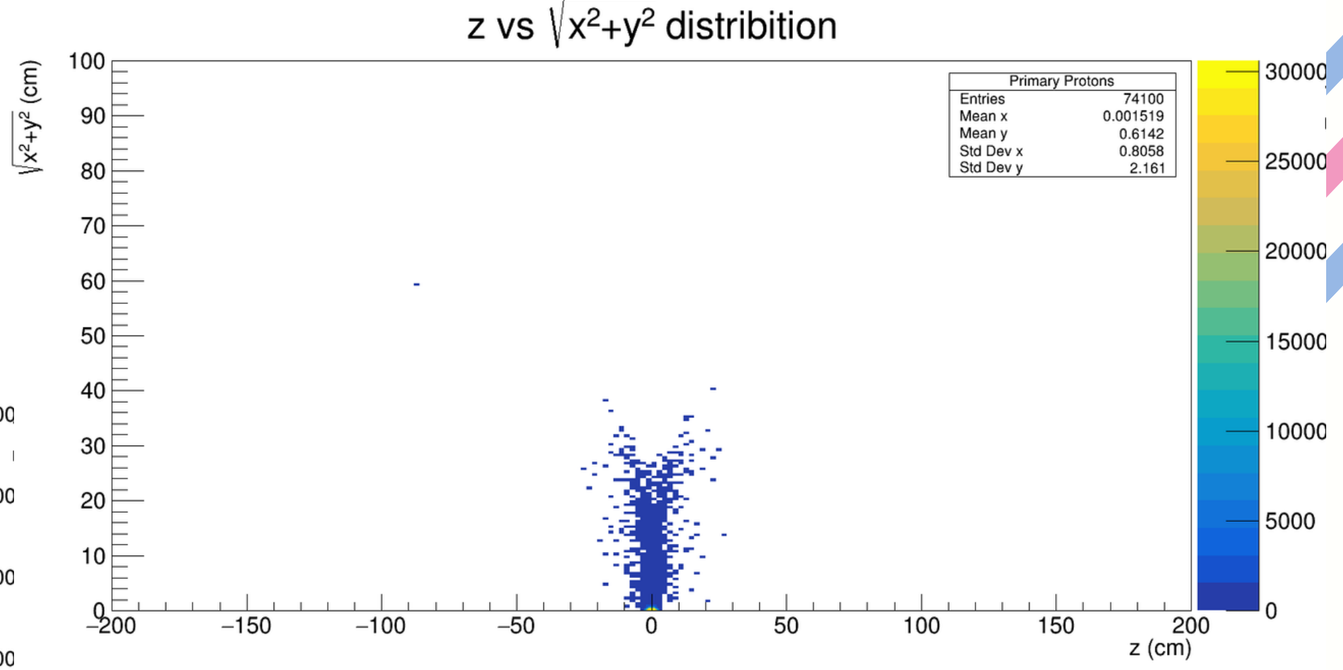


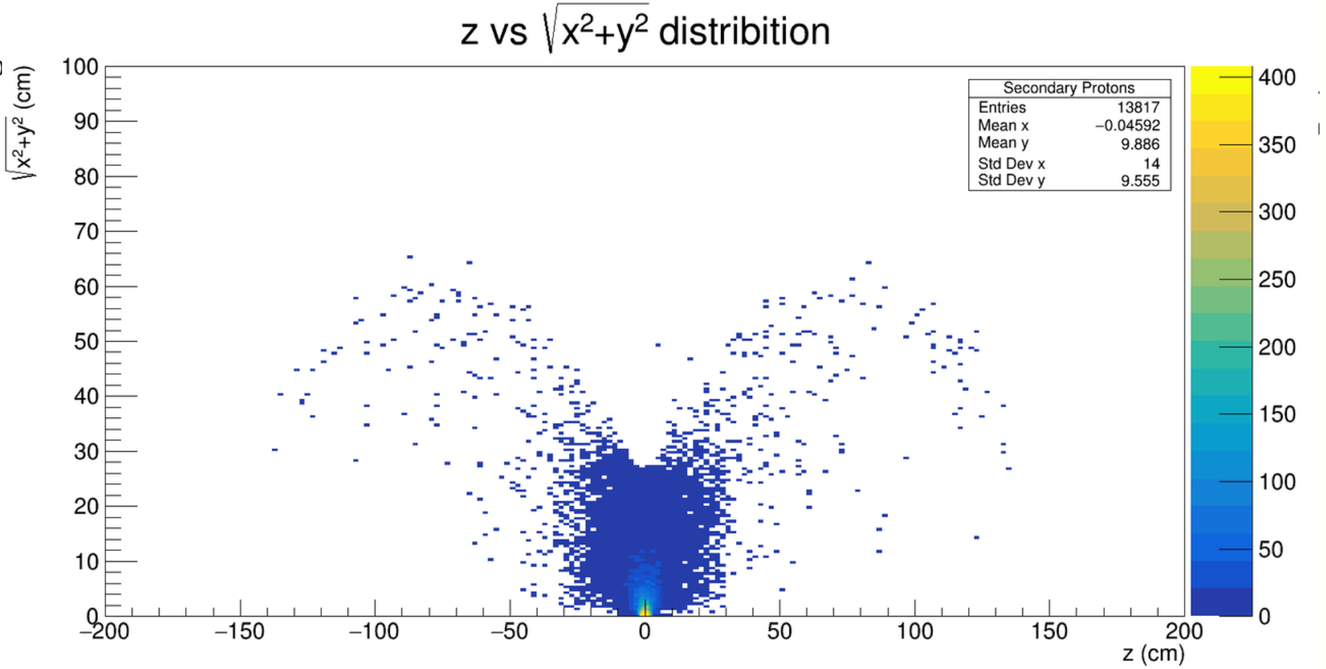




Distribution of Protons en z vs radius while function of DCAGlobal







Percentage Deuterons		
All	100__%	87 917
Primary	84.28__%	74 100
Secondary	15.72__%	13 817

Conclusiones

By taking the ratio between the primary and secondary particles with respect to the total particles, it allowed us to see the percentage with the regions where there is greater contamination. Telling us in interval where