

**SECONDARY TRACKS WHICH  
LOOK LIKE PRIMARIES.**

**Antonio Ortiz Velasquez.**

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## 1 Cuts to select primary tracks.

The simulation consists in: pp collisions, 14 TeV, minimum bias, data on CAF, 583300 events.

To select tracks from primaries, the following cuts were applied:

**Quality/resolution cuts** are default ESD tracks cuts.

$$N_{\text{clustersinTPC}} > 50 \quad (1)$$

$$\frac{\chi^2}{N_{\text{clustersinTPC}}} \leq 3.5 \quad (2)$$

$$\sigma_y^2 < 2\text{cm}^2 \quad (3)$$

$$\sigma_z^2 < 2\text{cm}^2 \quad (4)$$

$$\sigma_{\sin(\phi)}^2 < 0.5 \quad (5)$$

$$\sigma_{\tan(\theta)}^2 < 0.5 \quad (6)$$

$$\sigma_{\frac{1}{p_T}}^2 < 2(\text{GeV}/c)^{-2} \quad (7)$$

**Track to vertex cut** is made by cutting on distance of closest approach (DCA) normalized by the expected resolution (see PWG0).

$$N_\sigma < 3 \quad (8)$$

**ITS cuts** these cuts are implemented to guaranty the participation of ITS in the reconstruction, these cuts are:

1. at least one cluster in ITS.

$$N_{\text{clustersinITS}} > 1 \quad (9)$$

2. ITS refit is required.

**Other flags:** TPC has to contribute in the reconstruction.

1. TPC refit is required: in order to select tracks where TPC has contributed.
2. Not tracks labeled as kink daughters.

After of the selection of primary tracks, it is interesting to see the production vertex distribution for them. To do it:

1. Get the label of track.
2. Obtain MC information (production vertex) of the labeled track.

The result of this analysis it is that 1.9% of these tracks have their production vertex outside of the beam. So we have secondary tracks which look like primary. To understand: why do these secondary tracks survive to all cuts to select primaries? In this work some correlations (vertex - PT and vertex - DCA) appear.

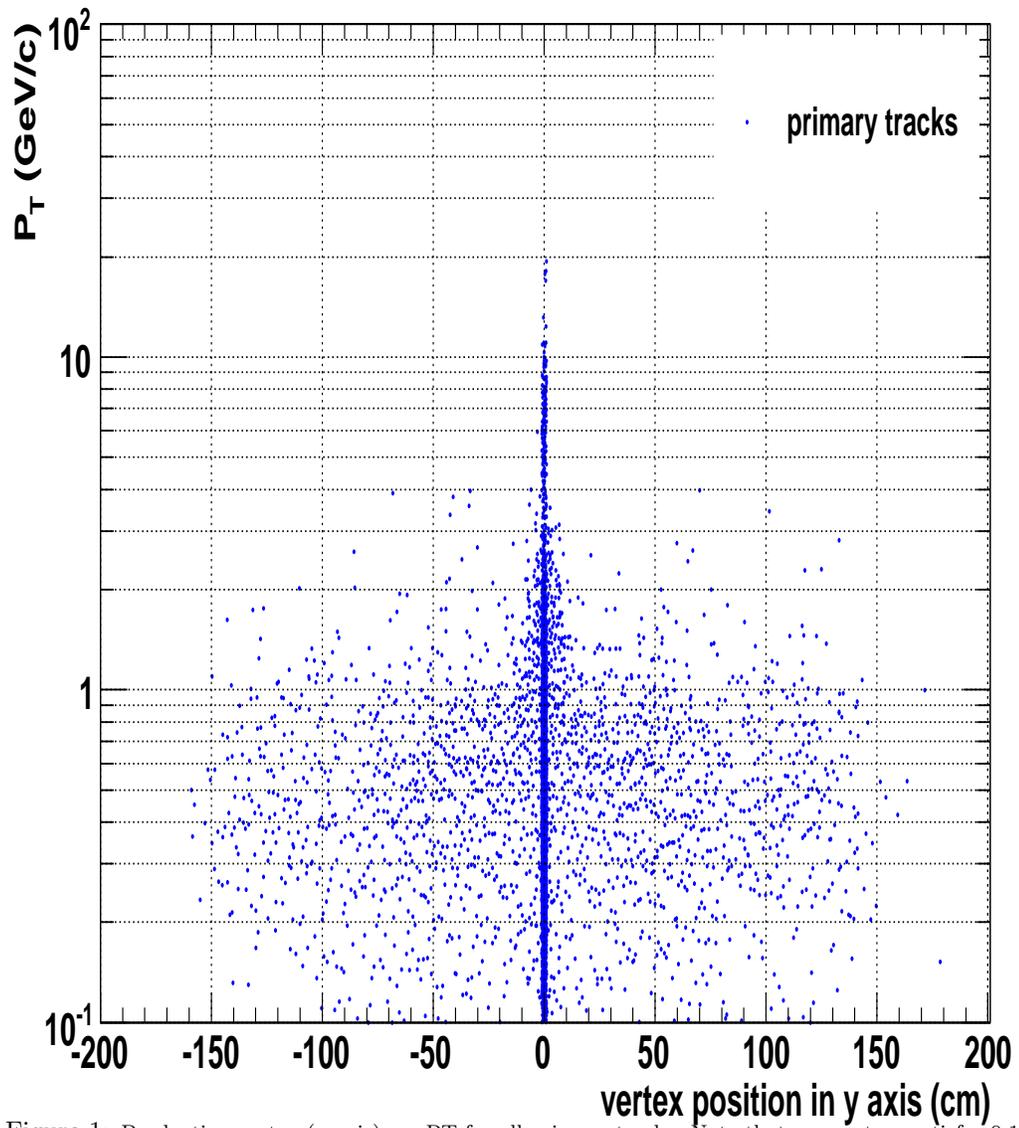


Figure 1: Production vertex (y axis) vs.  $P_T$  for all primary tracks. Note that momentum satisfy:  $0.1 \leq P_T$

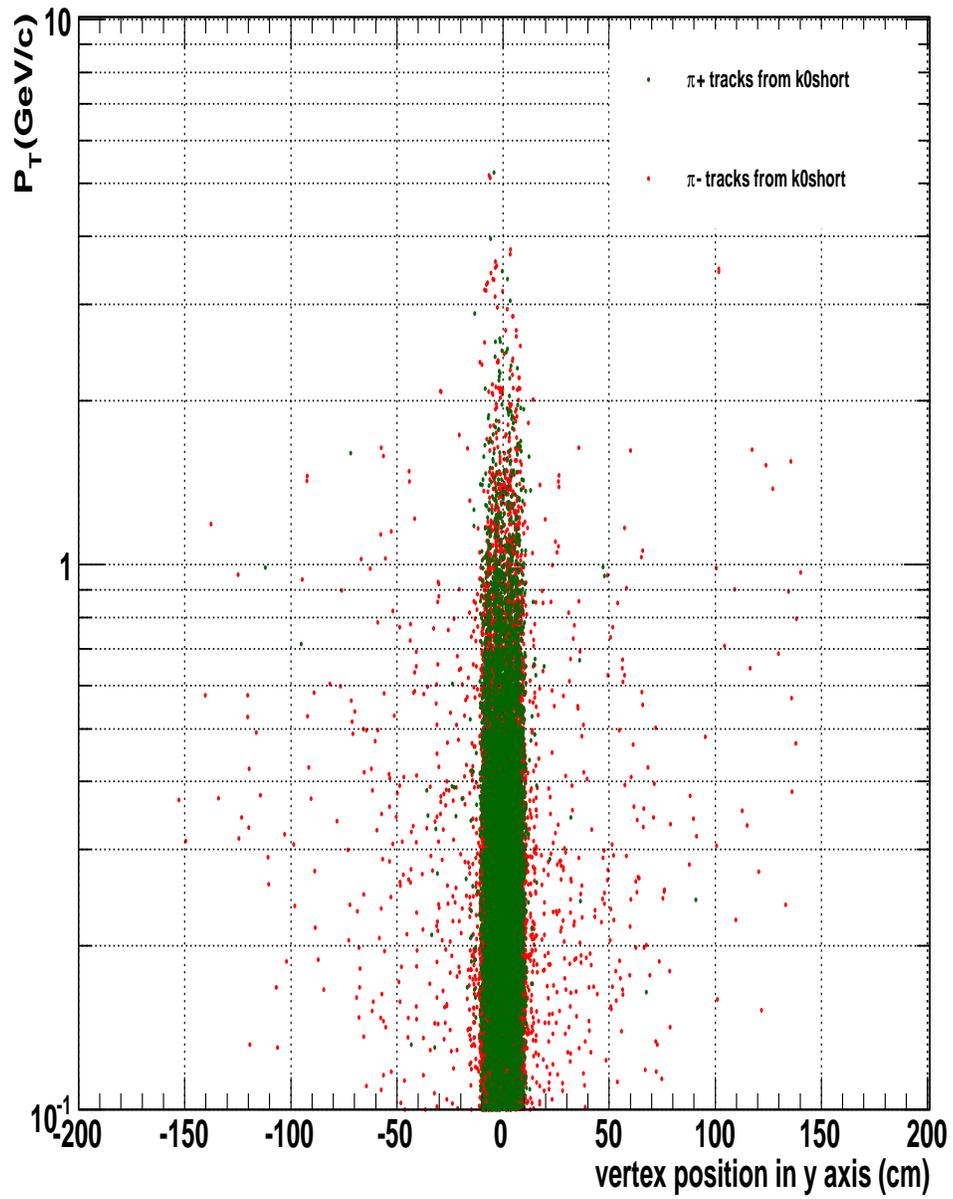


Figure 2: Production vertex (y axis) vs.  $P_T$  for tracks from  $k_0$  short decay.

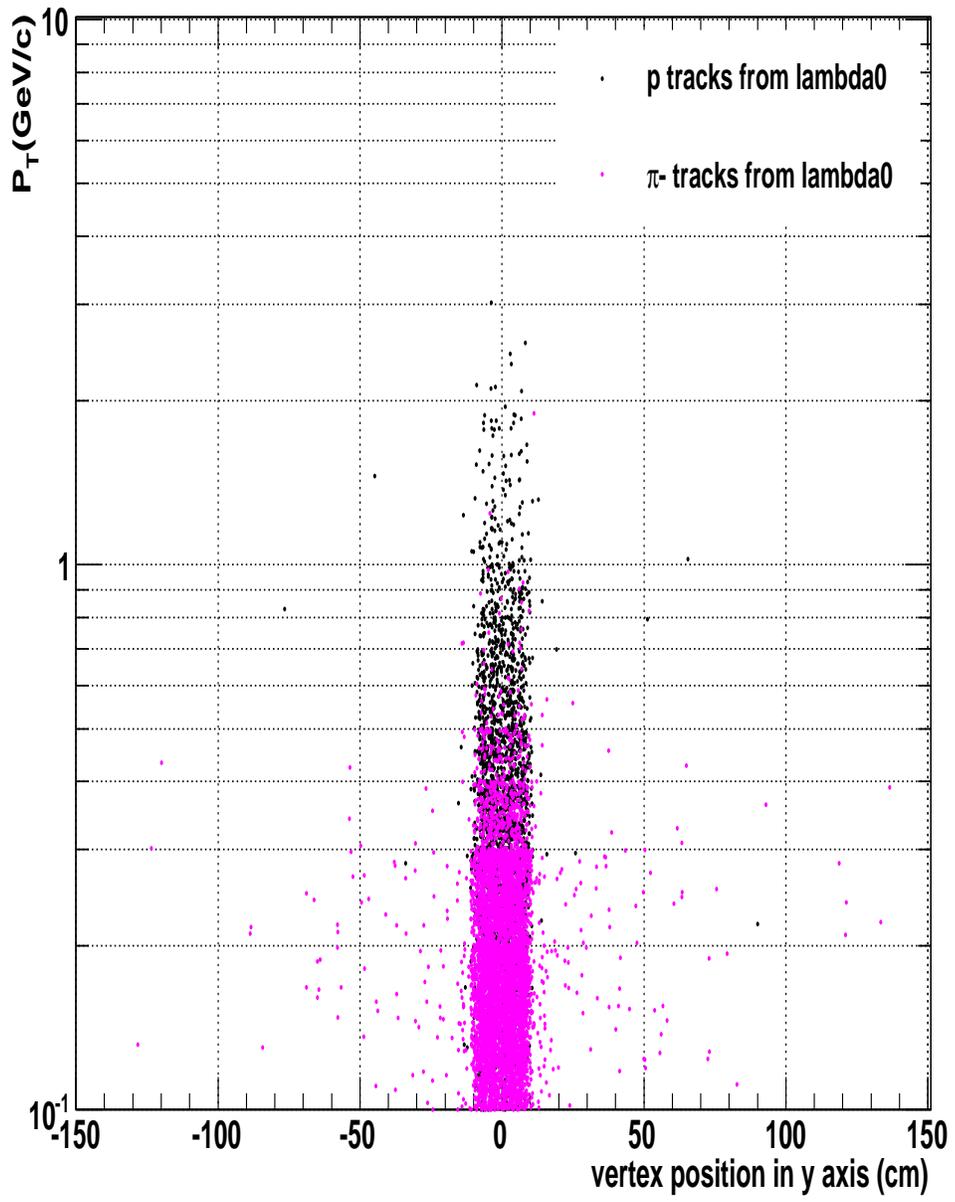


Figure 3: Production vertex (y axis) vs.  $P_T$  for tracks from  $\lambda$  decay.

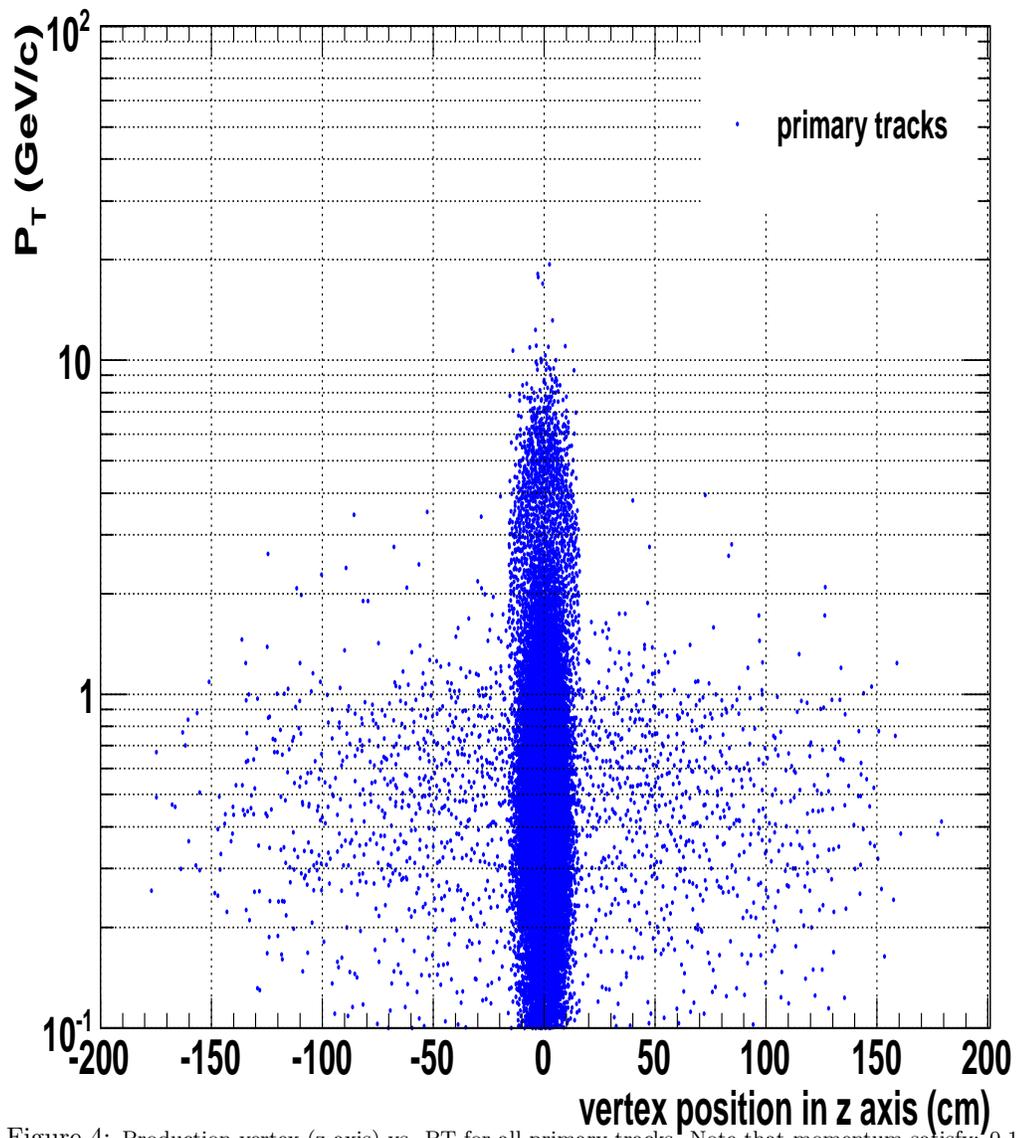


Figure 4: Production vertex (z axis) vs.  $P_T$  for all primary tracks. Note that momentum satisfy:  $0.1 \leq P_T$

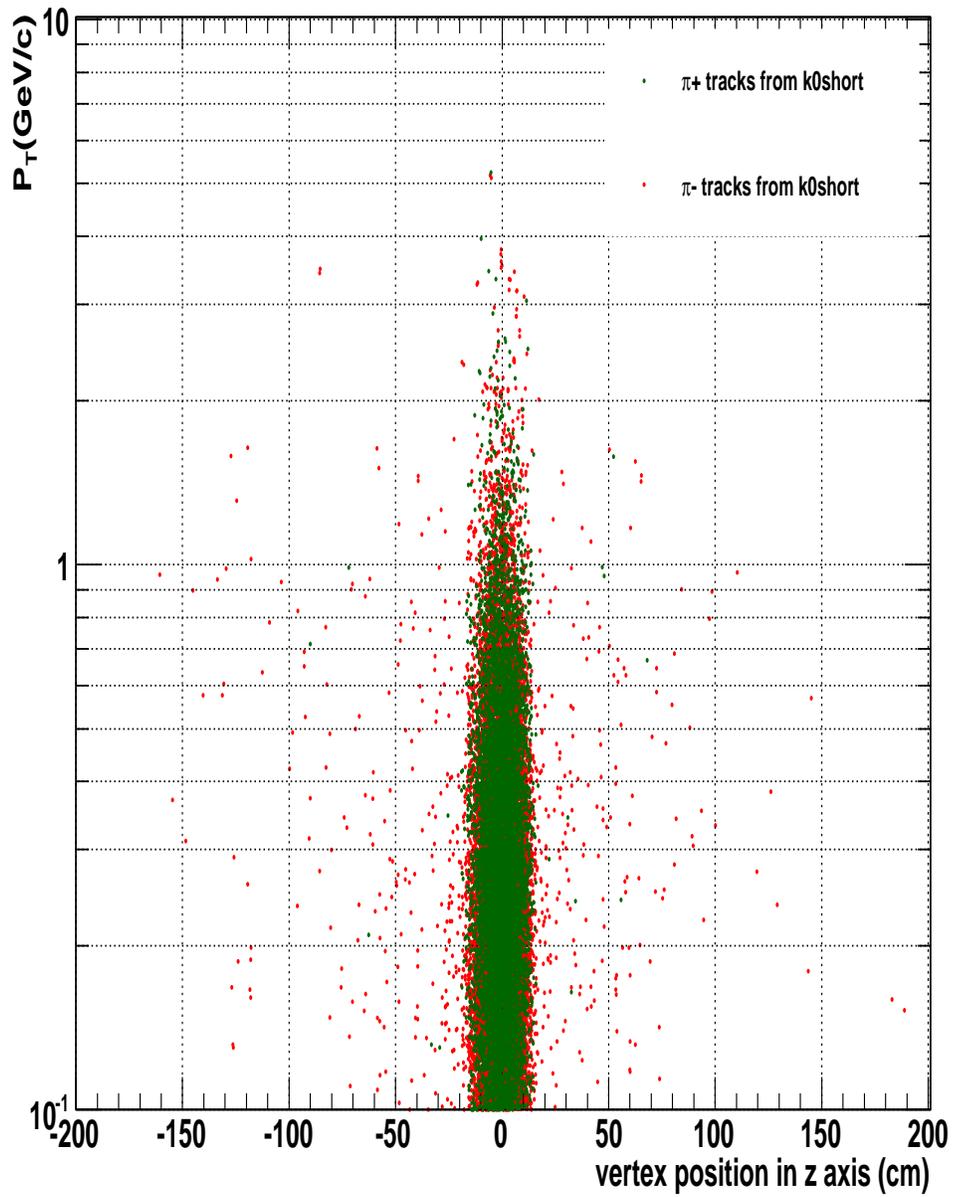


Figure 5: Production vertex (z axis) vs.  $P_T$  for tracks from  $k_0$  short decay.

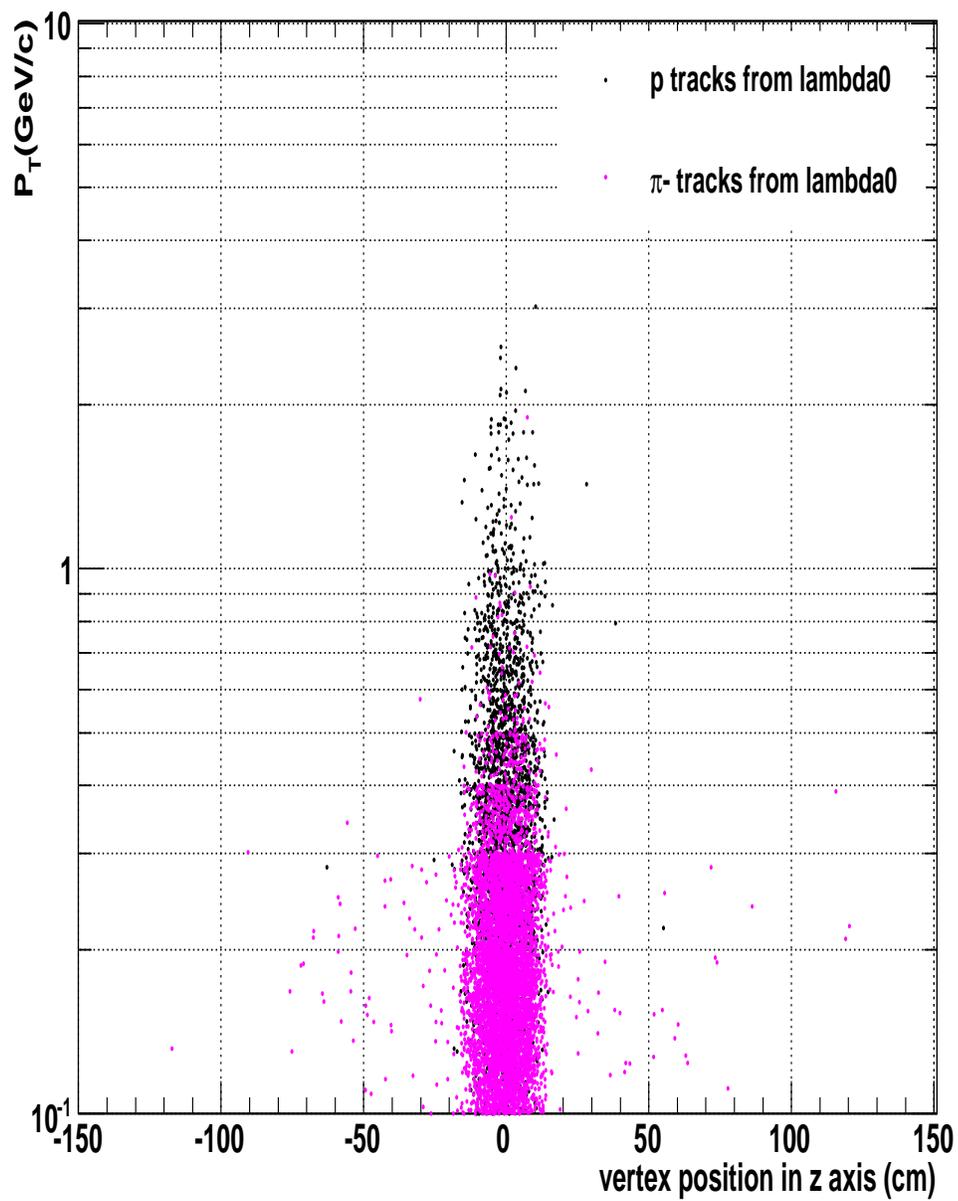


Figure 6: Production vertex (z axis) vs.  $P_T$  for tracks from  $\lambda^0$  decay.

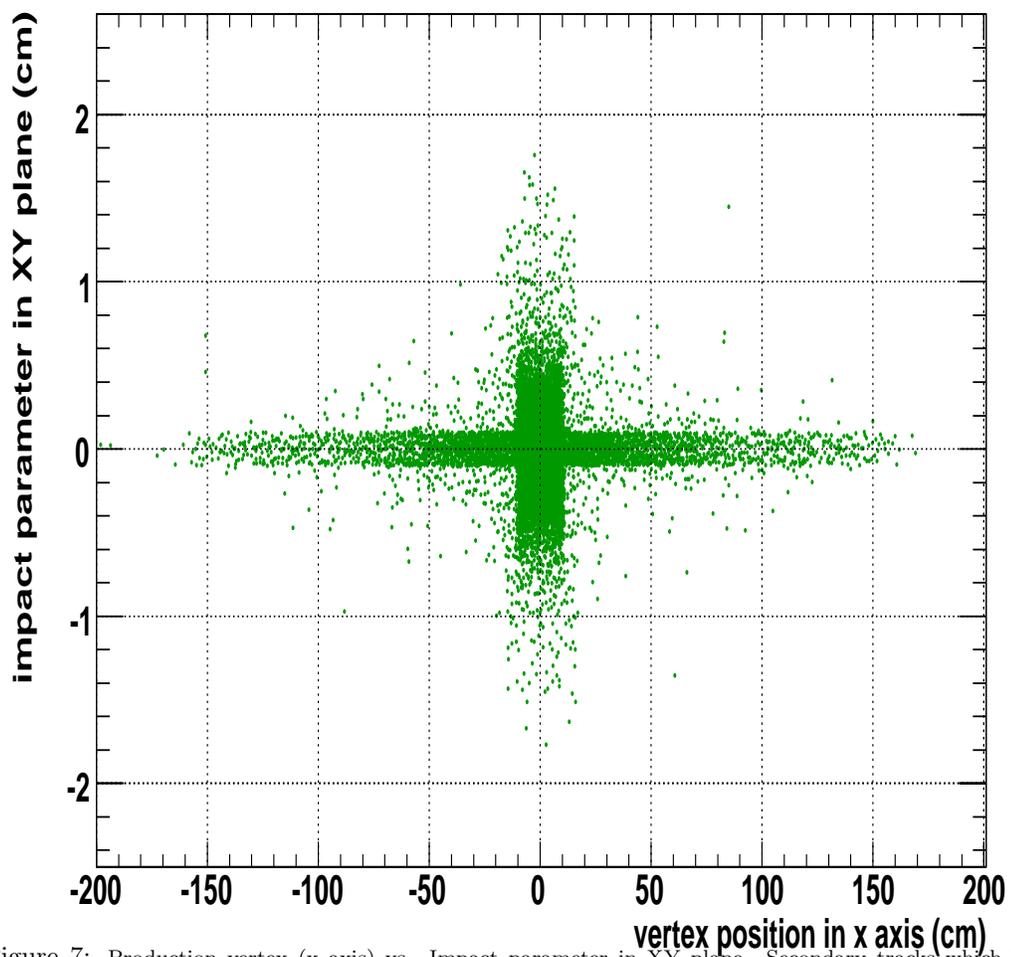


Figure 7: Production vertex (x axis) vs. Impact parameter in XY plane. Secondary tracks which look like primaries.

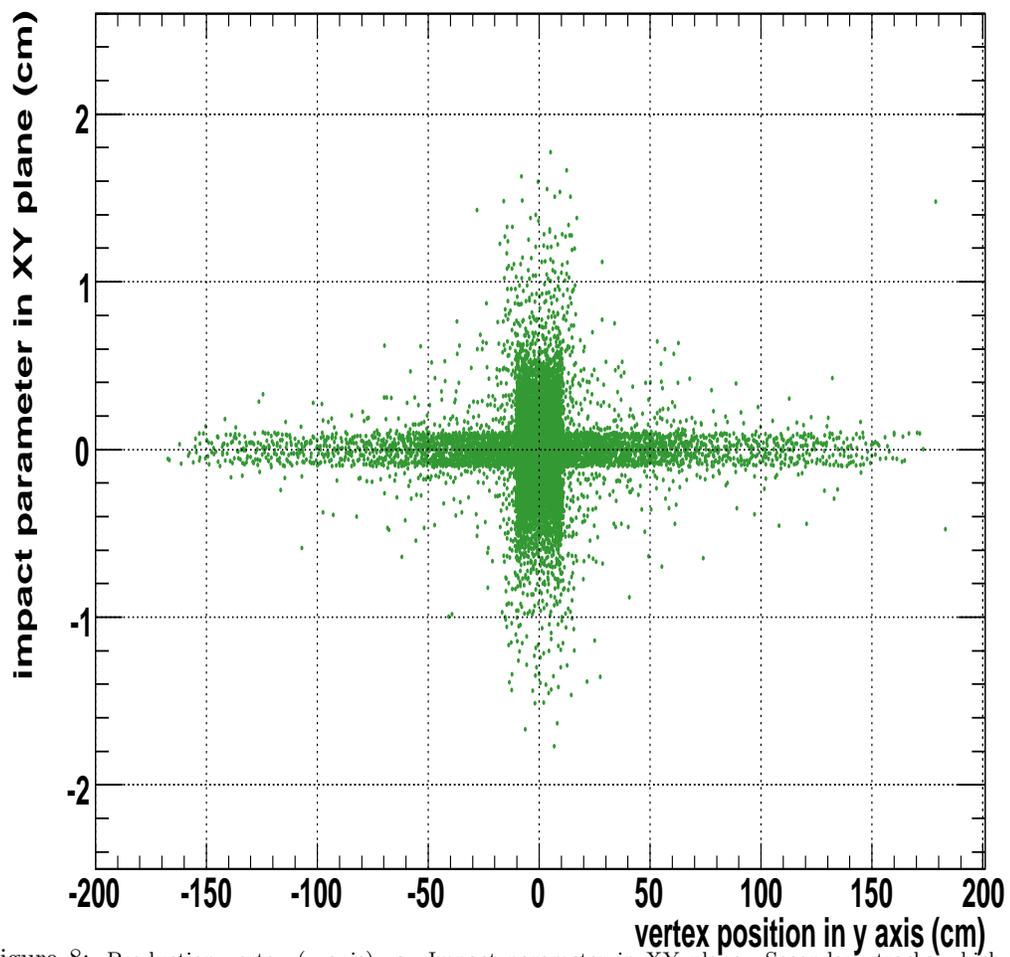


Figure 8: Production vertex (y axis) vs. Impact parameter in XY plane. Secondary tracks which look like primaries.

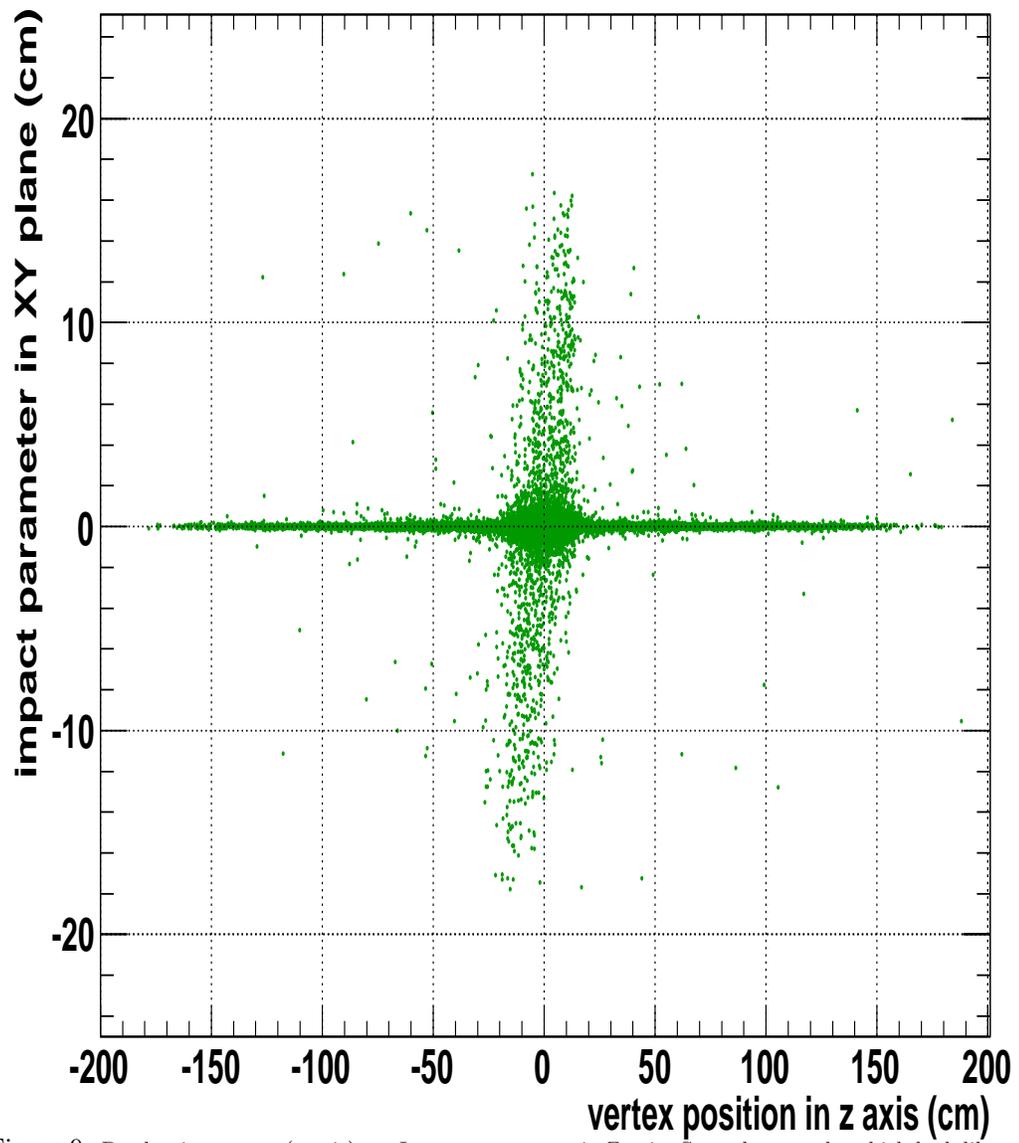


Figure 9: Production vertex (z axis) vs. Impact parameter in Z axis. Secondary tracks which look like primaries.