

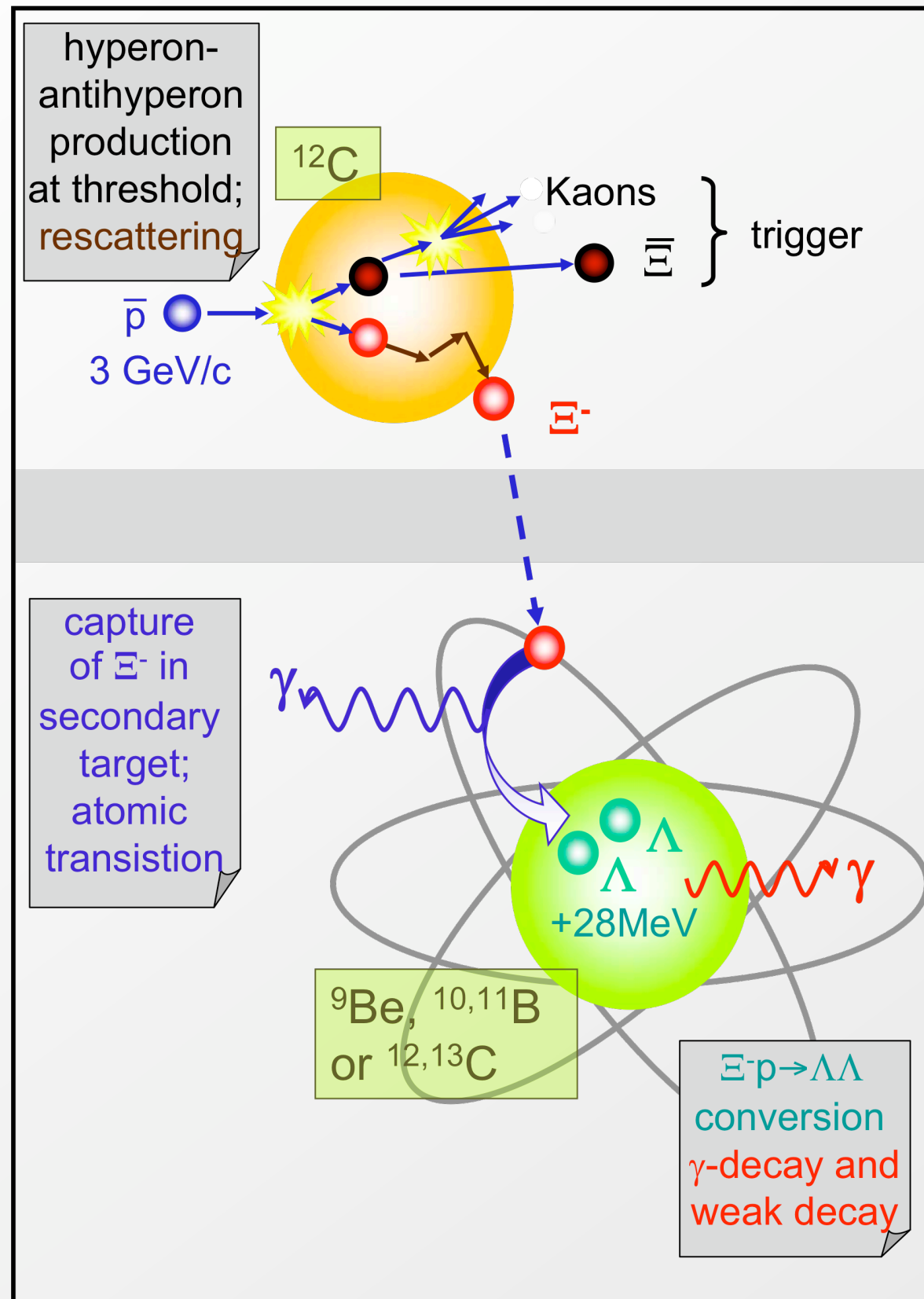
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# Low kaon identification studies based on tof measurements.

Alicia Sanchez Lorente

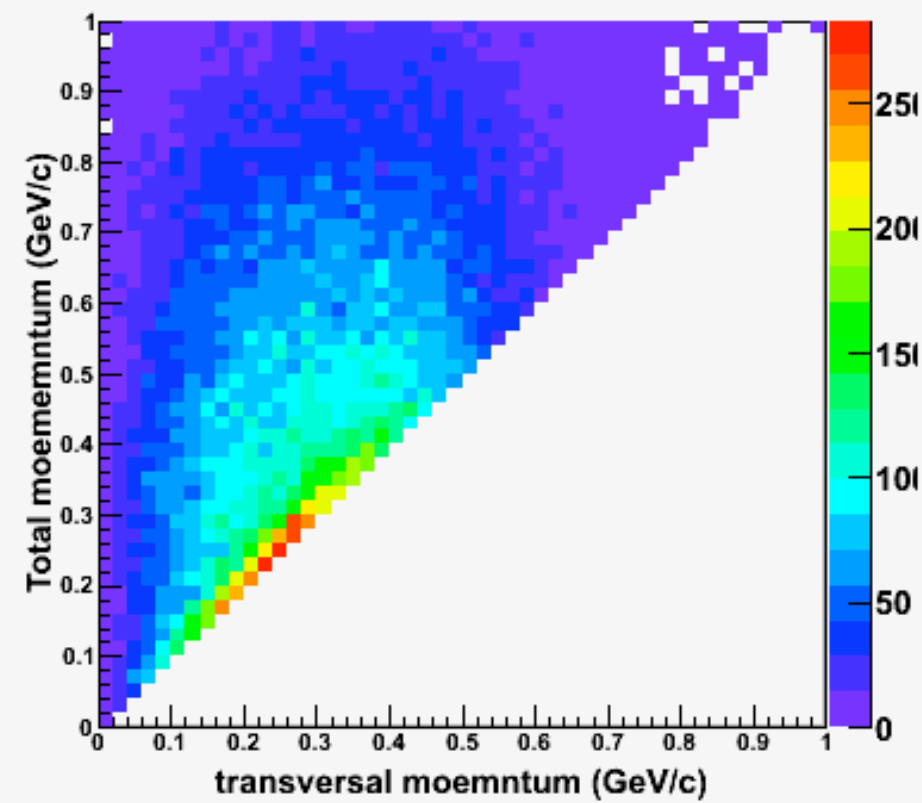
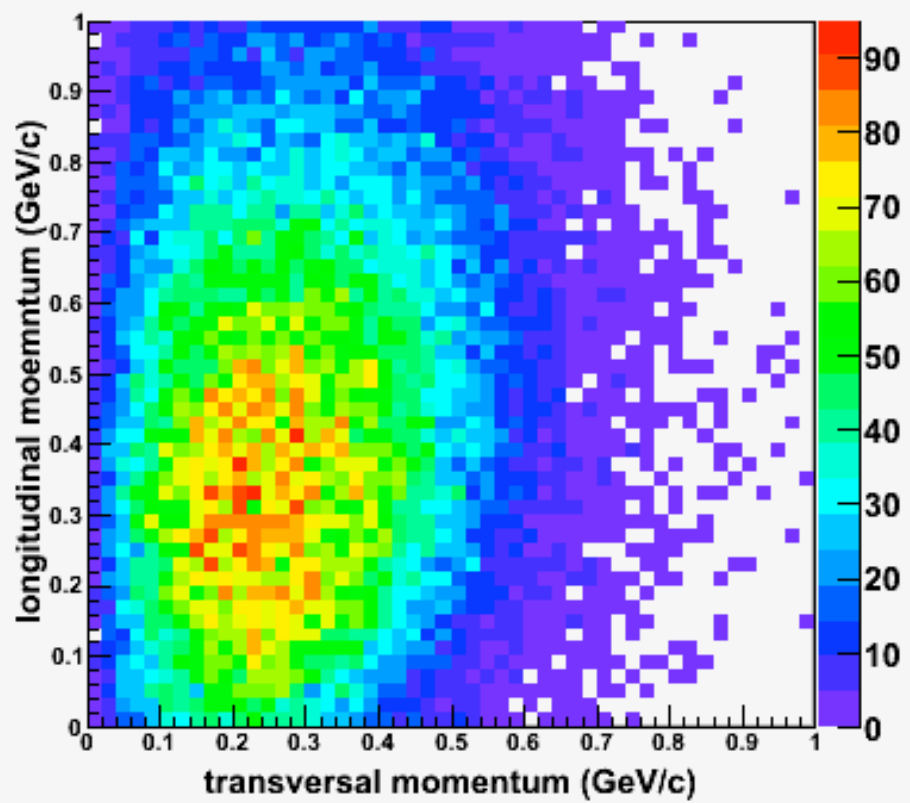
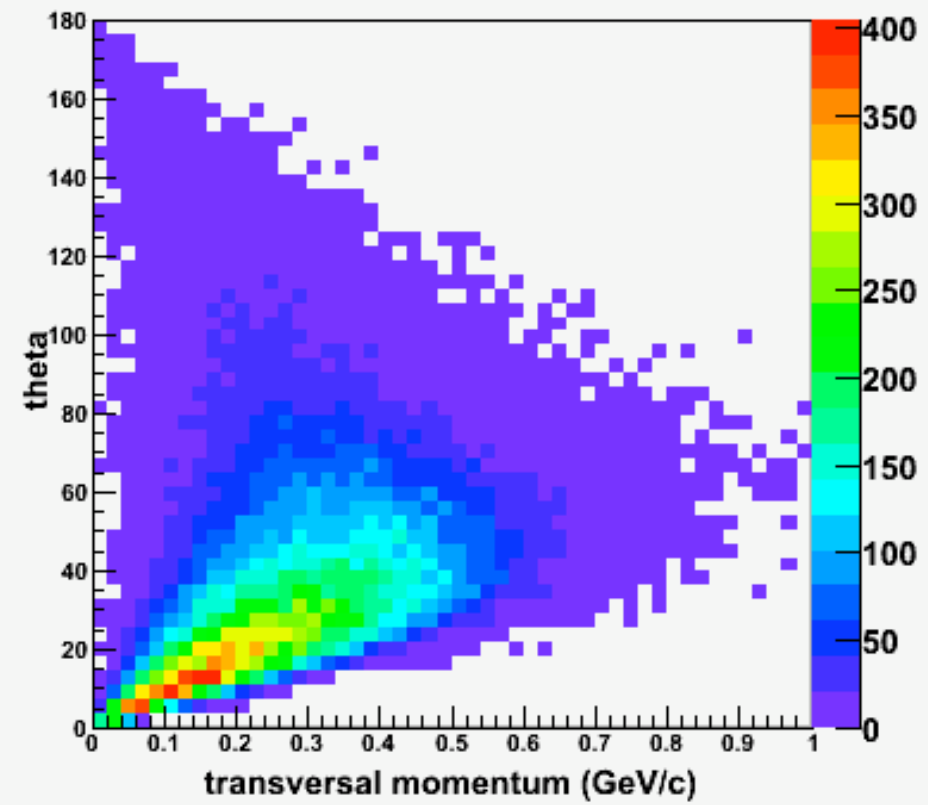
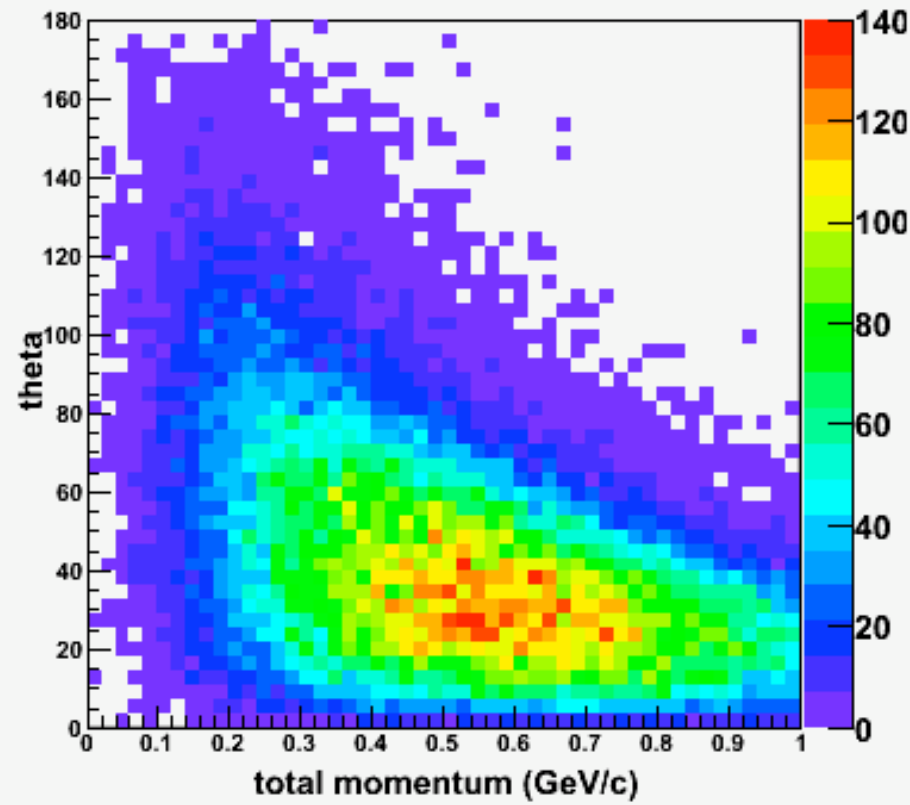


## II Production of double hypernuclei at PANDA



- $\bar{p} + \text{Nucleus} \rightarrow \Xi^- + \Xi^+$  at 3 GeV/c
- Cross section  $2\mu\text{b}$
- Luminosity  $10^{32} \text{ cm}^{-2}/\text{s}^{-1}$  to  $7 \cdot 10^5 \Xi^- + \Xi^+$  hour
- $\Xi^- p \rightarrow \Lambda\Lambda + 28 \text{ MeV}$
- energy release may give rise to the emission of excited hyperfragments
- Two-step production mechanism requires a devoted setup

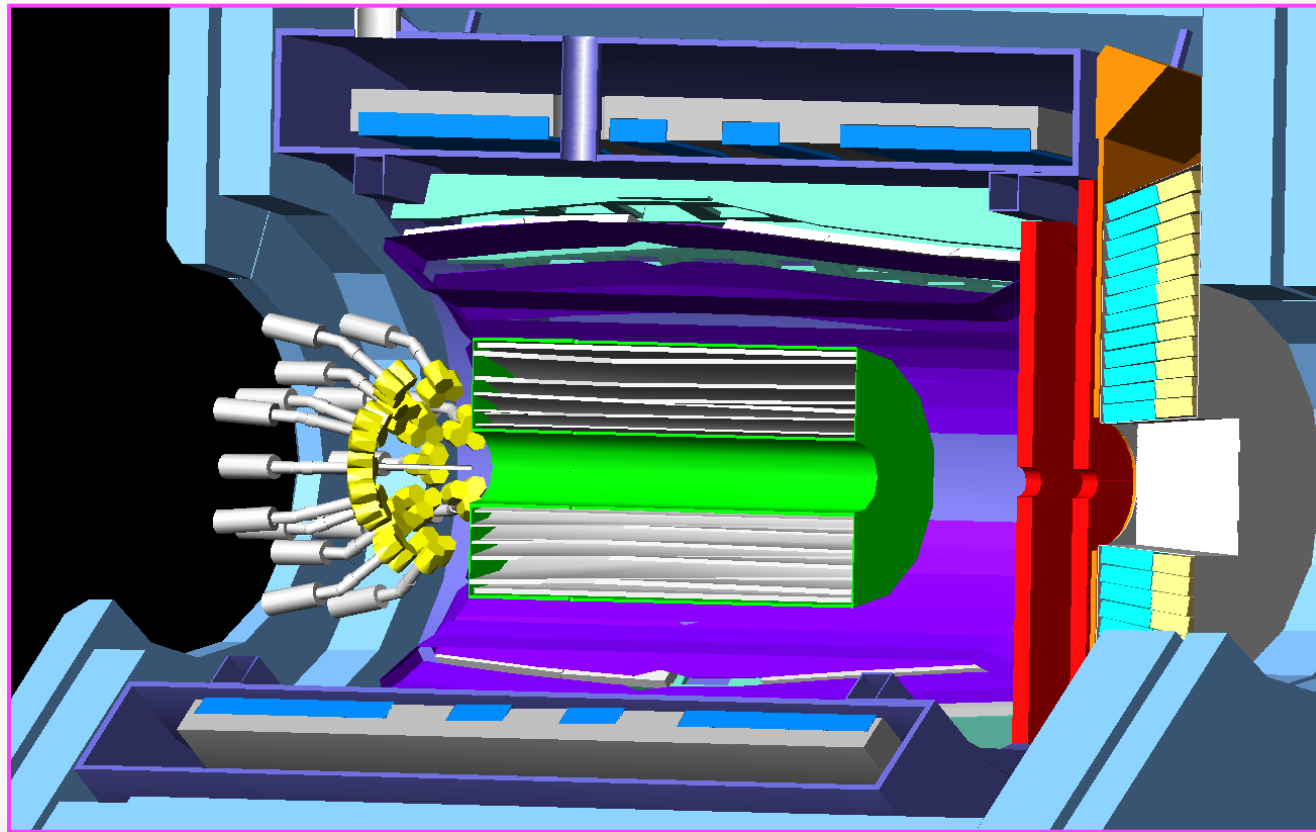
# associated kaon distribution



## Posibilities:

- TPC Use of  $(dE/dx)$  for PID
- TPC + TOF detector system for low kaon identification:
  - Start scintillator fibers ~1250 fibers
  - Stop tof barrel ~16 Slabs ~6 bars

# SciF+TPC + TOF



•Tof barrel (STOP)

Time resolution  $\sim 80\text{ps}$

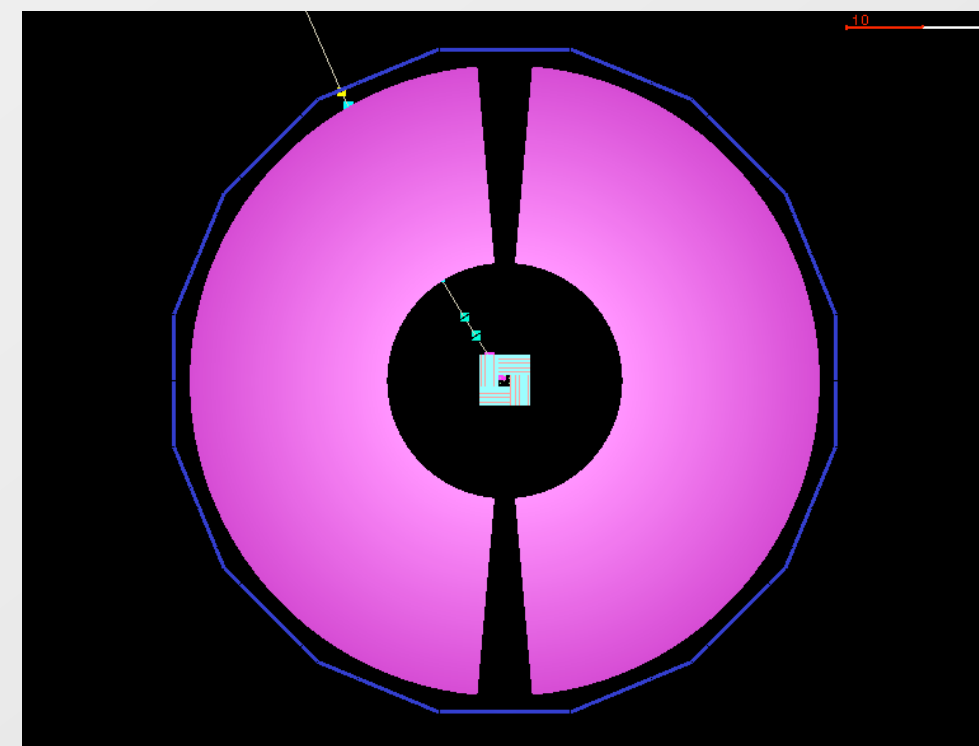
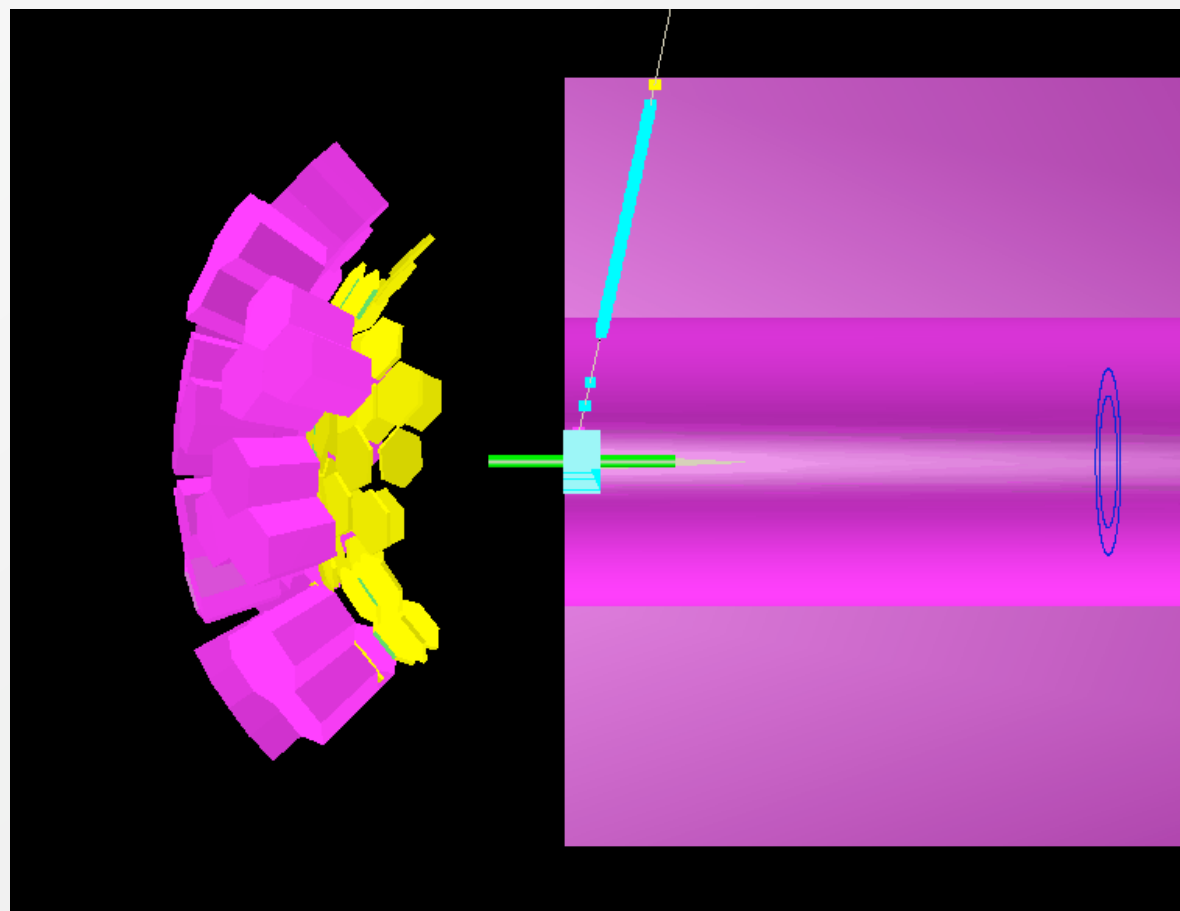
•SciF + SiPMT (START)

$\sim 450\text{ ps}$

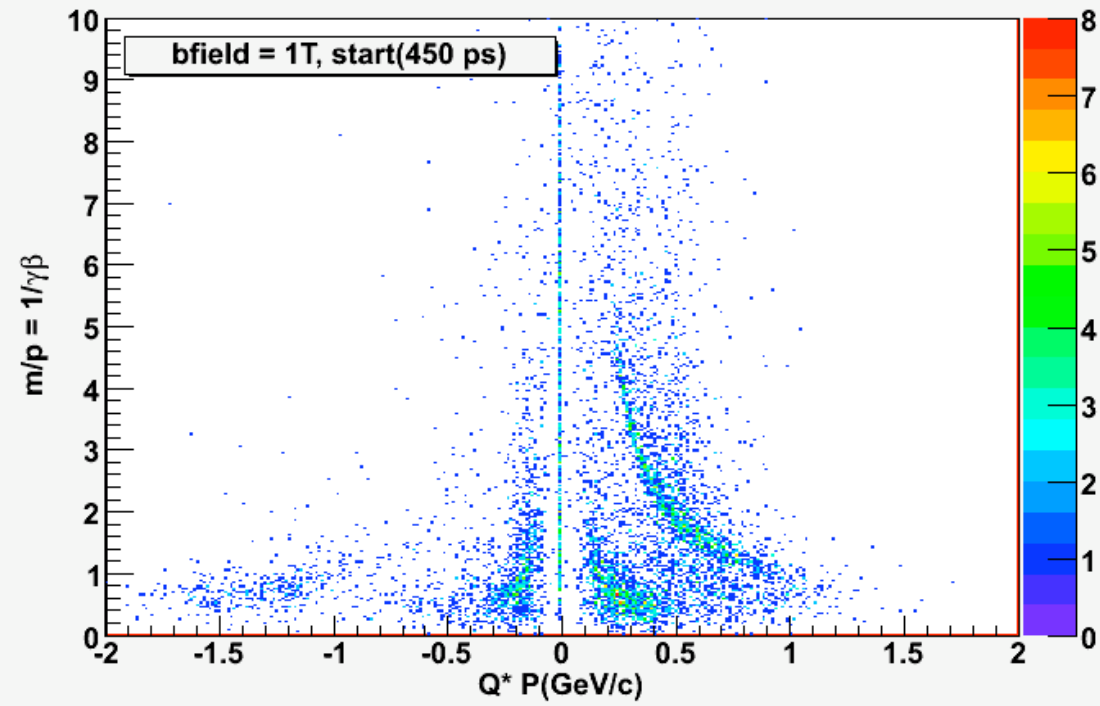
•TPC + Others (SCT): tracking

Track **Length** + P

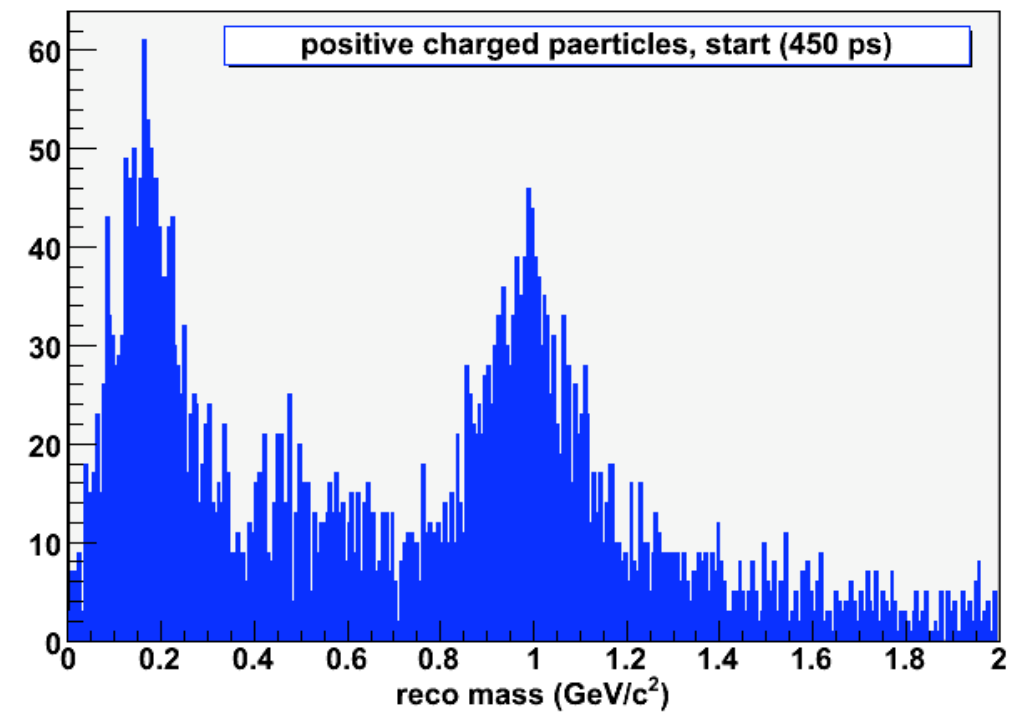
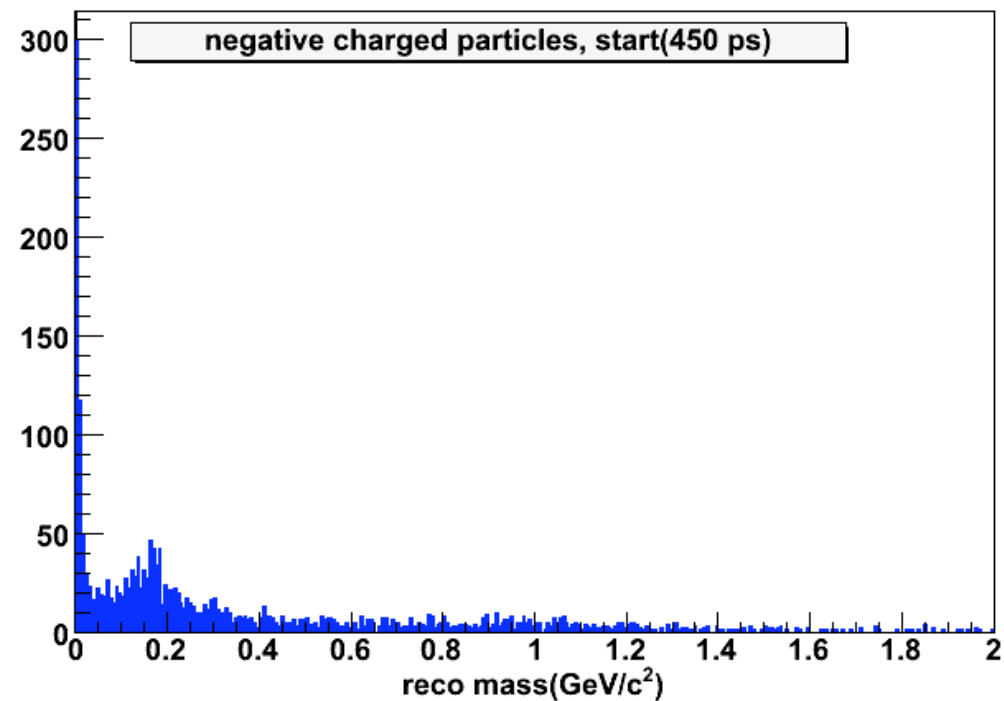
$$P/\text{Mass} = \beta * \gamma$$



# Tof Studies at different magnetic field values

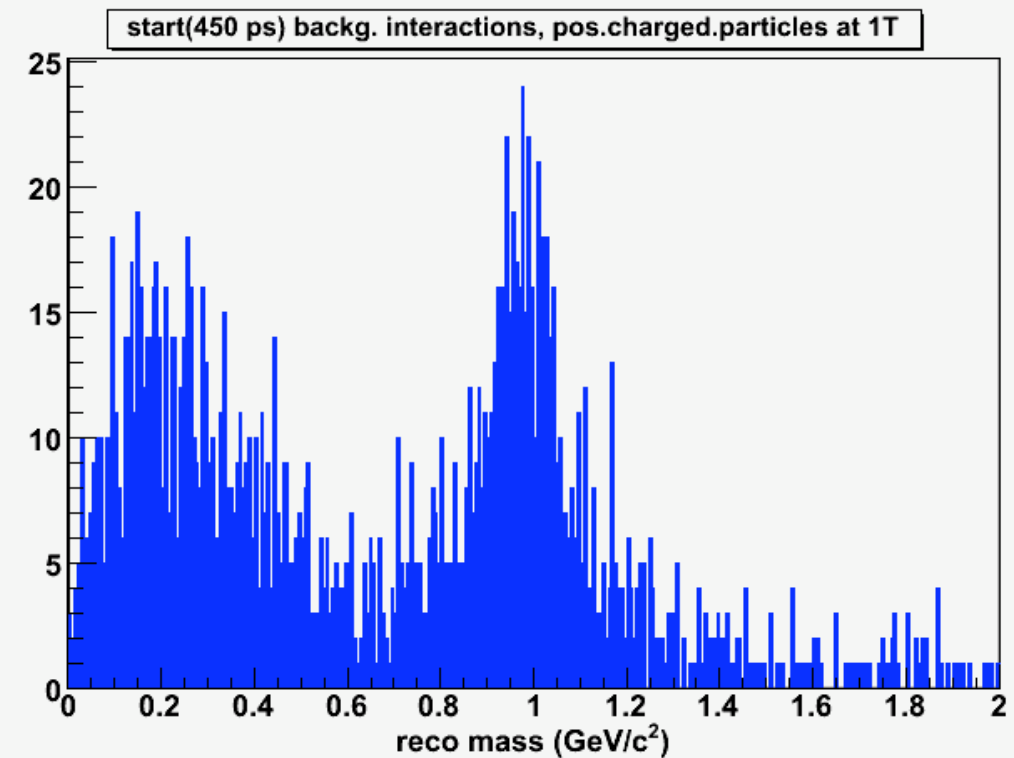
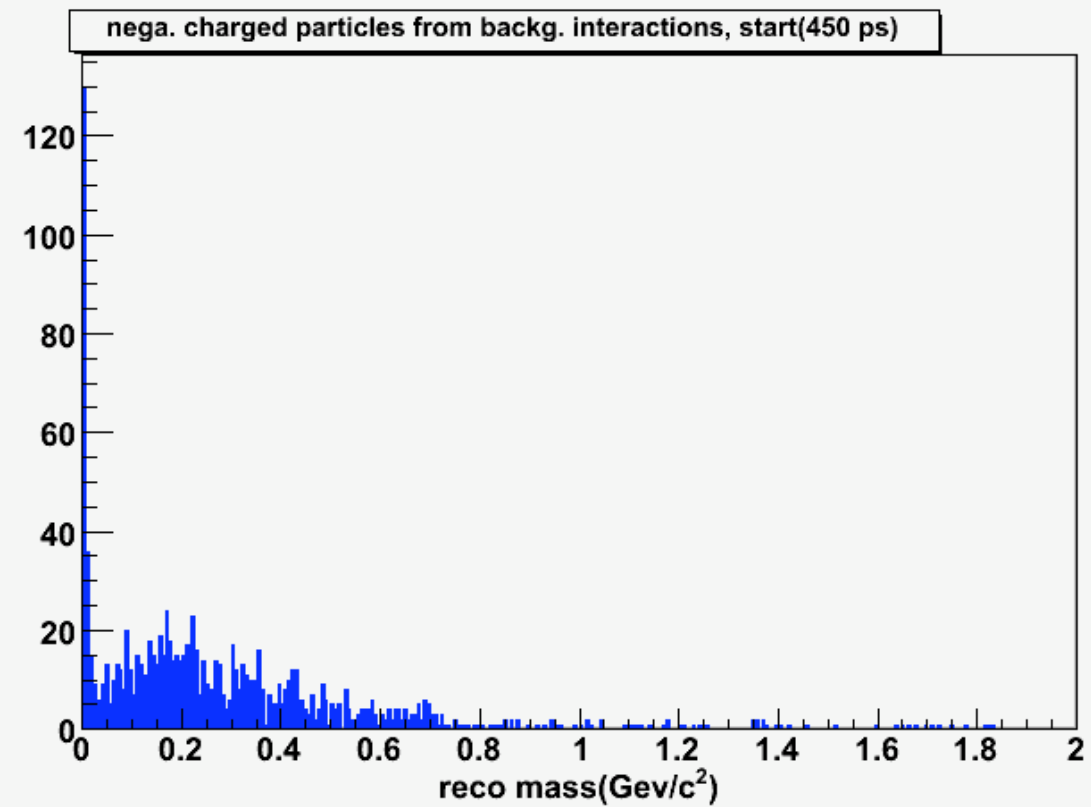


1. magnetic field value 1 T
2. start(450 ps)
3. annihilation products from Xbar

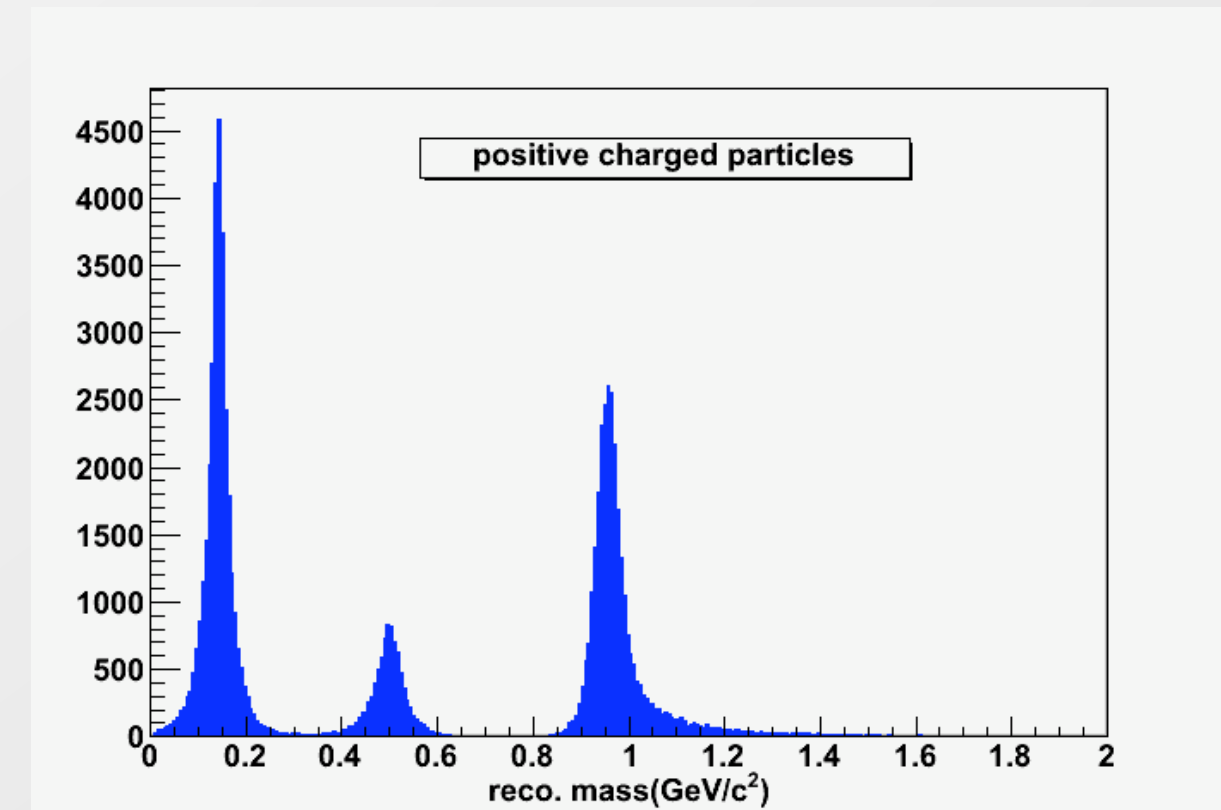
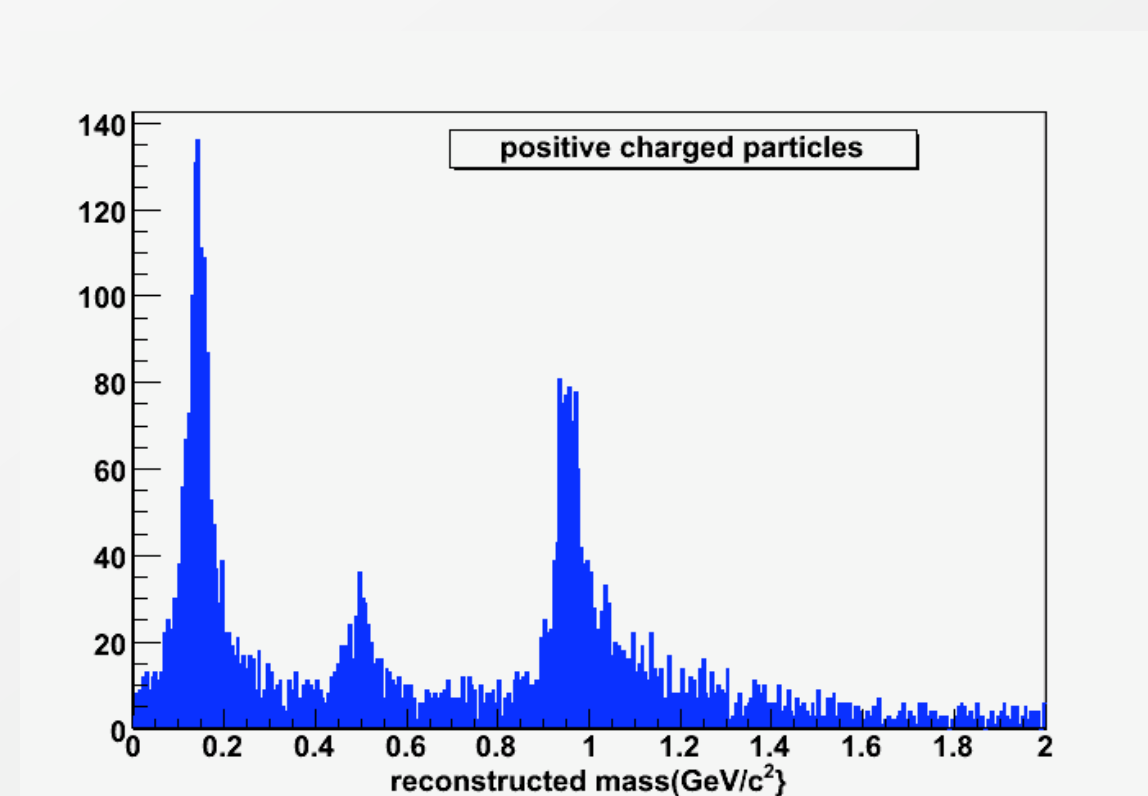
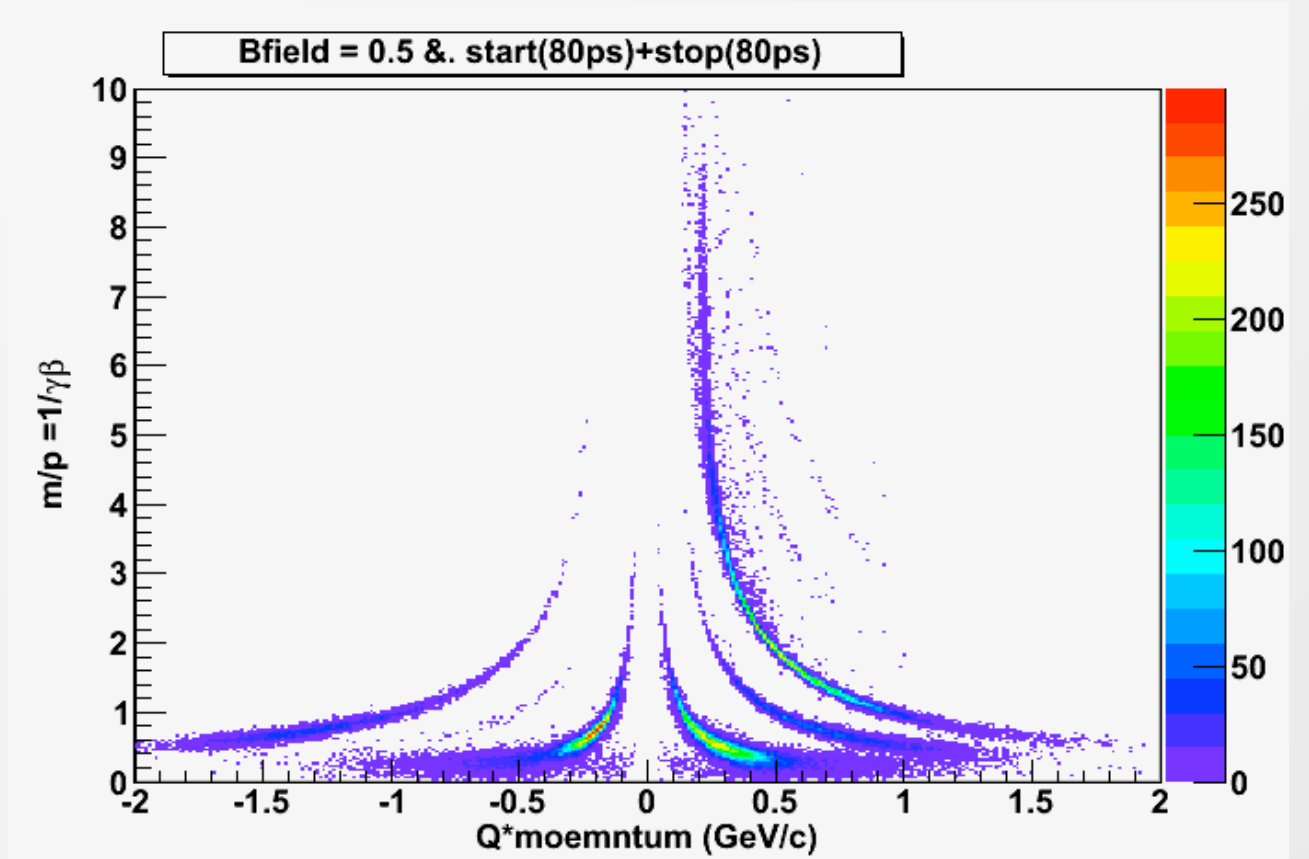
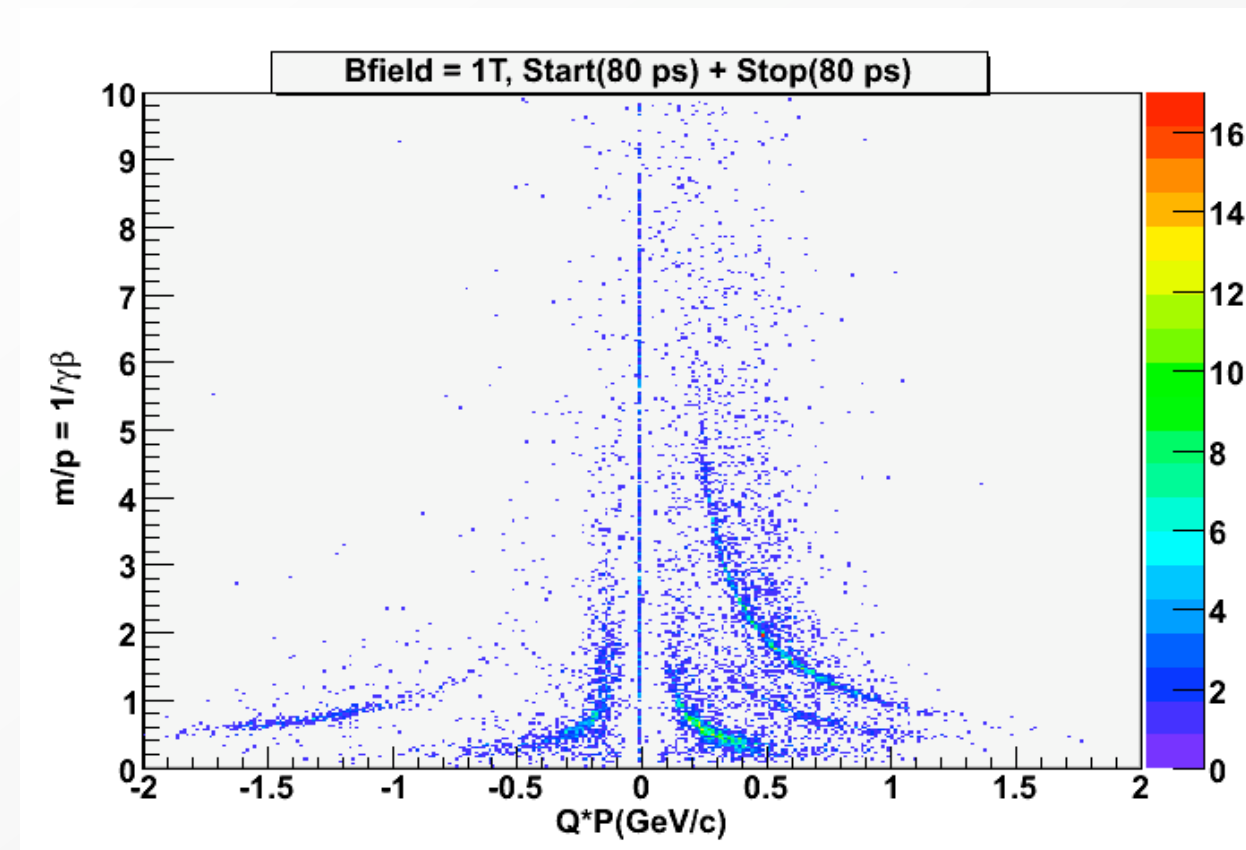


# Tof Studies at different magnetic field values

1. magnetic field value 1 T
2. start(450 ps)
3. Background reactions  $p + p\bar{b}$

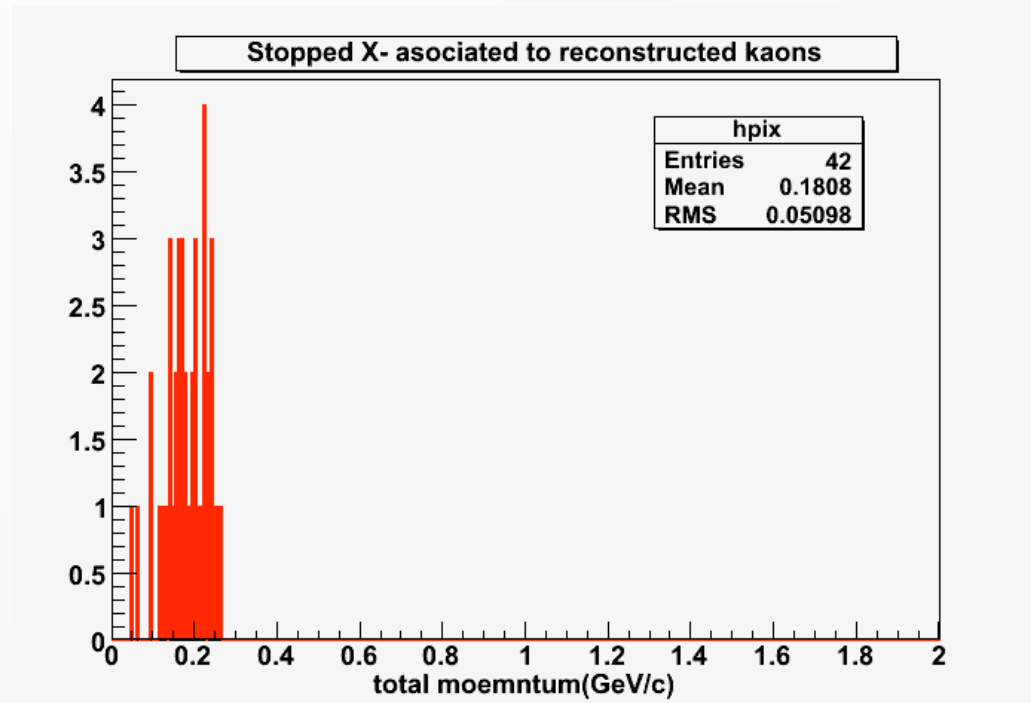


# Tof Studies at different magnetic field values

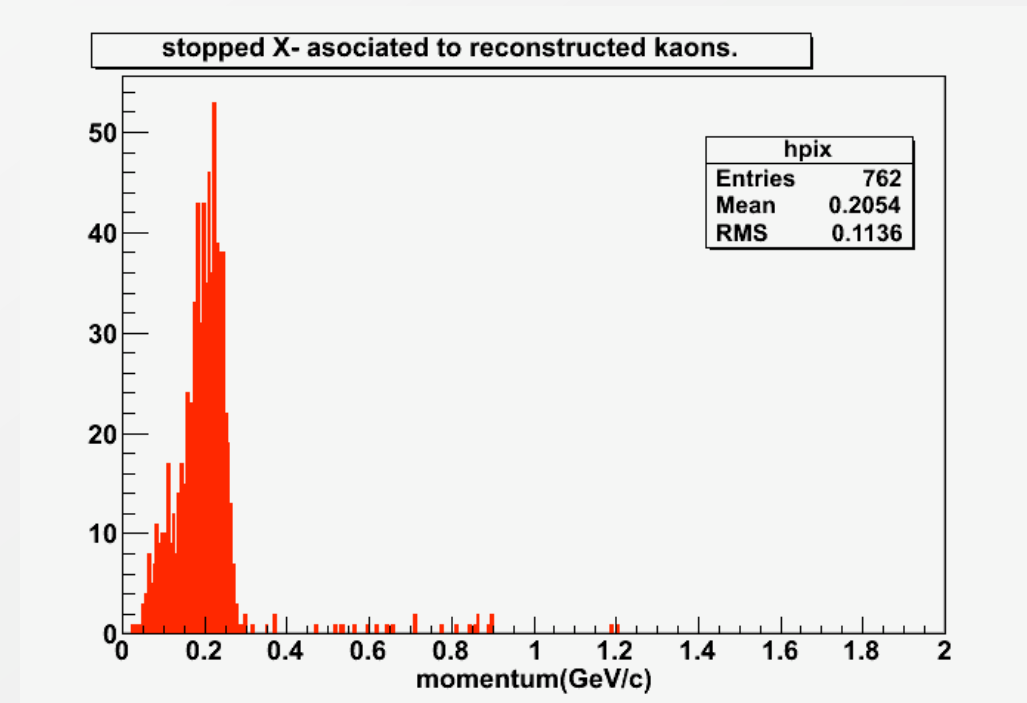




# Trigger on at least one reconstructed kaon



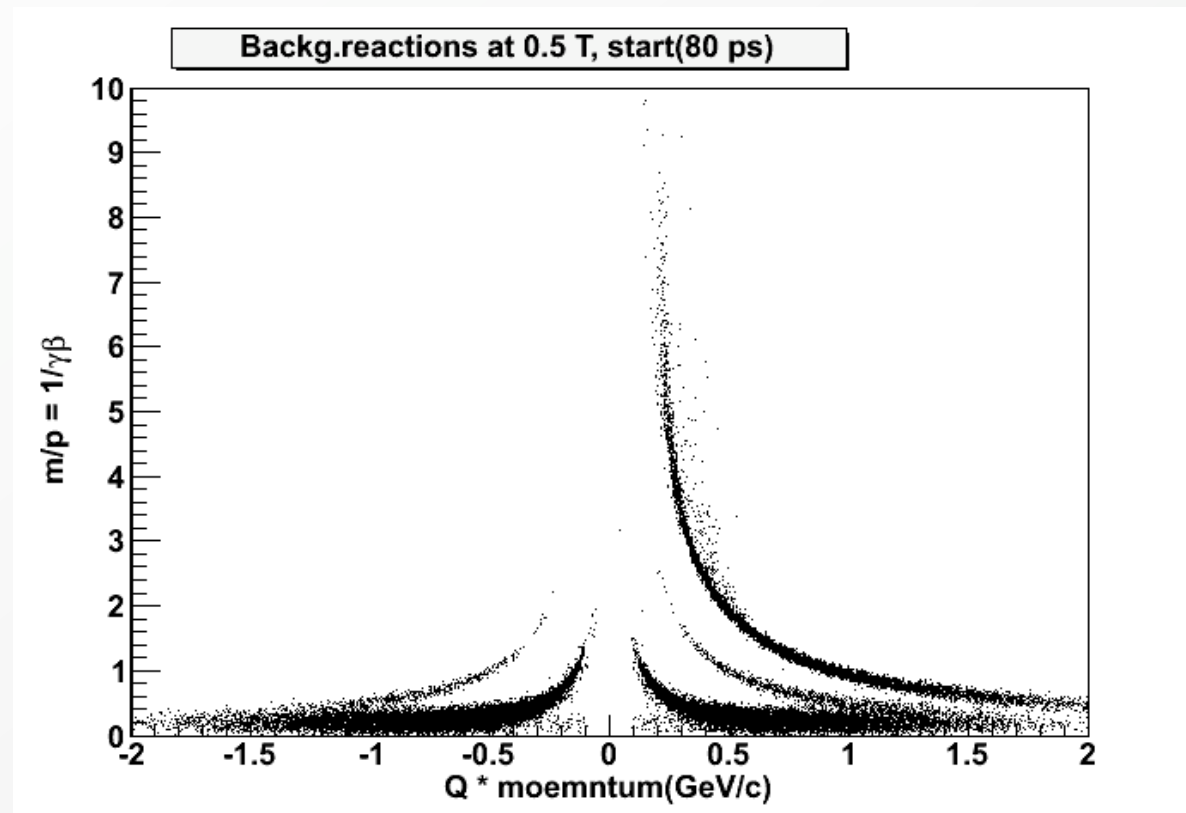
550 reco. kaons



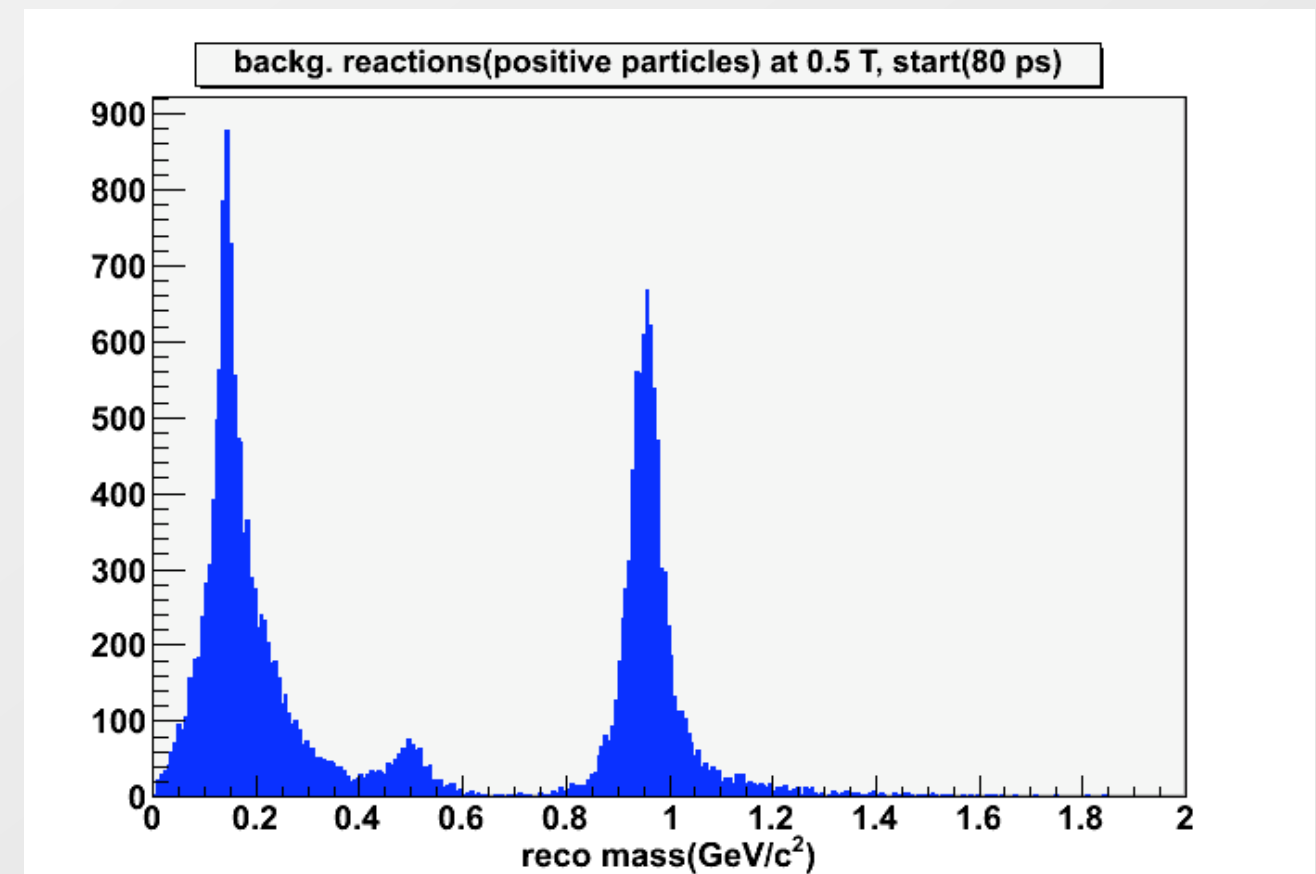
8900 reco. kaons

- Secondary target: MC provides circa 15000  $\Xi$  stopped

# Tof Studies at different magnetic field values



1. magnetic field value 0.5T
2. start(80 ps)
3. p+pbar reactions



## Conclusions:

1. Multiplicity kaon trigger based on TOF will be not enough.
2. Tracking information from Sec. Target has to be used complementary.
3. the start detector has to have a time resolution similar to the tofbarrel.
4. A possible start detector solution: diamond detector with a time resolution of 60-70 ps)
5. The most of the kaons are emitted into the forward region, which suggests the possibility of a tof forward disc immediately after the disc disc can be useful.

# Secondary target

