

Analysis logbook of primary trees  
21-Nov-2016

AIDA

AIDA Ttree: 161110\_0823\_aida25\_11to23.root

aida->Print():

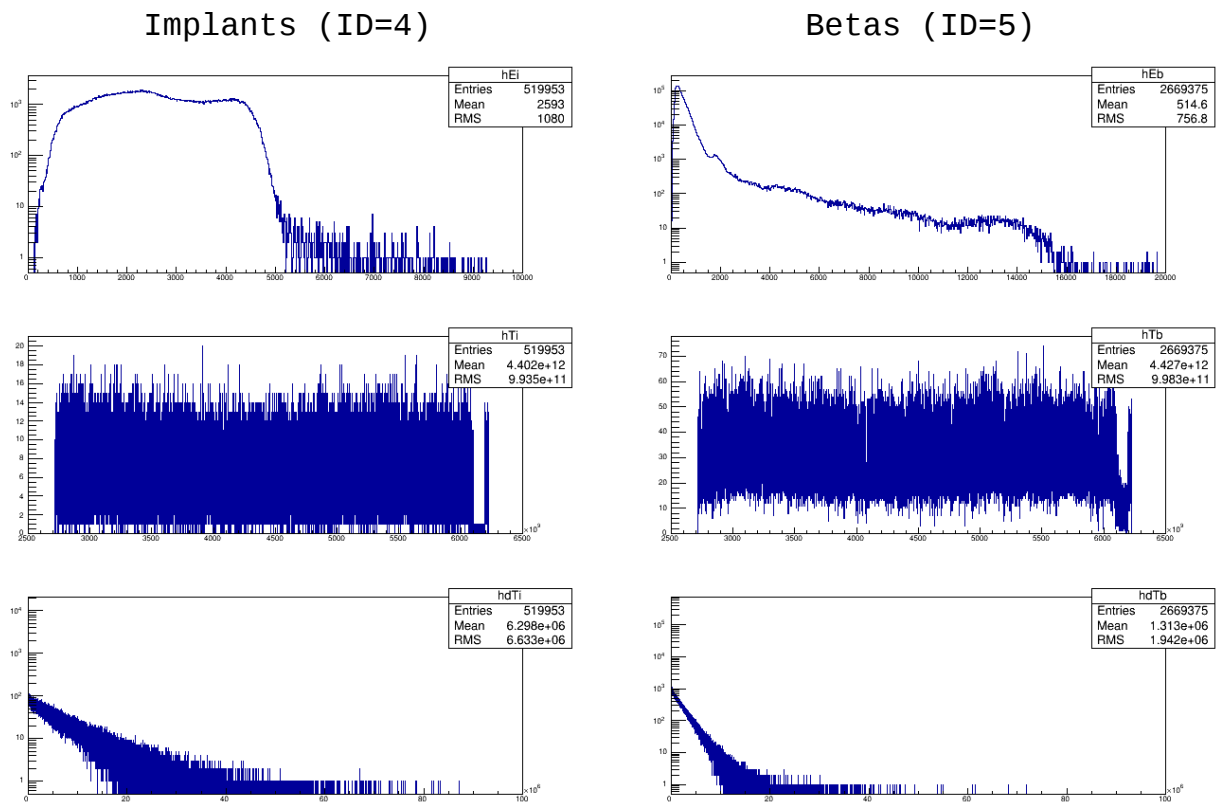
```
*****
*Tree      :aida      : aida tree ion and beta) *
*Entries   : 3189328 : Total =          245745535 bytes File Size = 128405538 *
*          :          : Tree compression factor = 1.91 *
*****
*Br       0 :aida      : T/l:Tfast/l:E/D:EX/D:EY/D:x/D:y/D:z/D:nx/I:ny/I:nz/I: *
*          | ID/b *
*Entries   : 3189328 : Total Size= 245745127 bytes File Size = 128388526 *
*Baskets   : 1821    : Basket Size= 4741632 bytes Compression= 1.91 *
*.....*
```

aida->Show(100000):

```
T                = 2829770790280
Tfast            = 0
E                = 248.161
EX              = 336.721
EY              = 159.601
x                = 9
y                = 85
z                = 1
nx              = 1
ny              = 1
nz              = 1
ID               = 5
```

T: in ns  
E: average of EX & EY, in units of keV (beta) or MeV (implant)  
x,y: in fractional strip units (?)  
z: in DSSD units  
nx,ny,nz: in strip units  
ID=4 : implant  
ID=5 : beta

Distribution of Energy (top), of Timestamp (middle) and Difference of timestamp (bottom) between successive events of type Implant (left) or Beta (right)

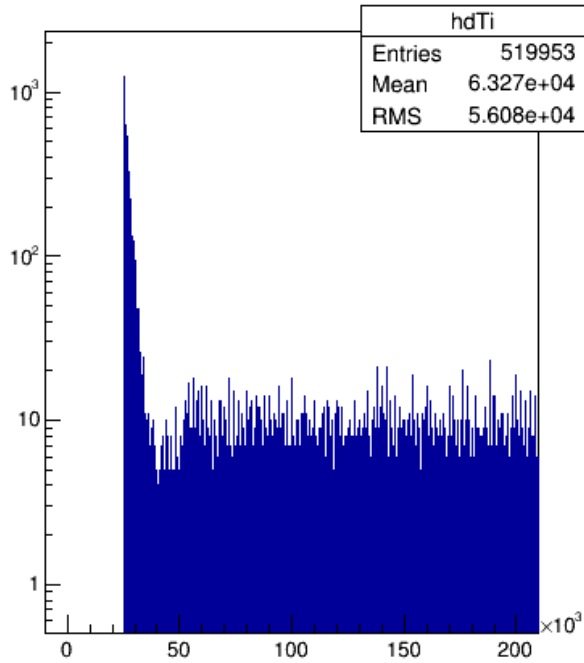


Observations:

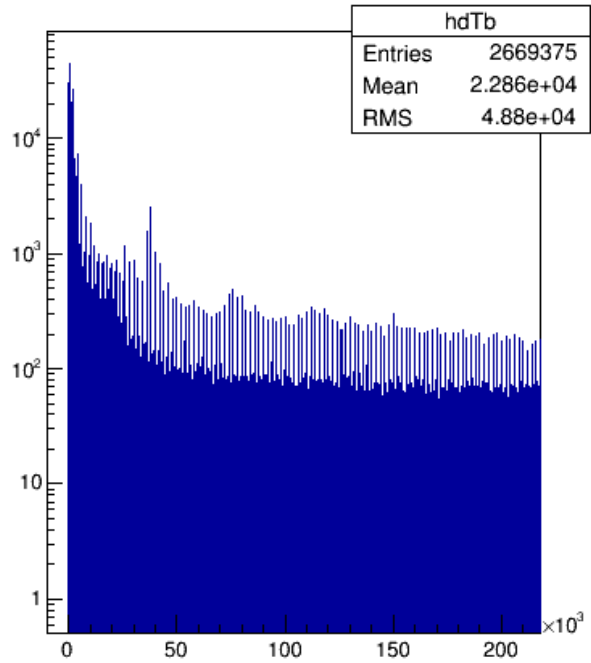
- Rate was rather constant except at the very end (beam off?)
- The dT distribution shows a nice exponential behaviour reflecting the different rates:  
Implants: 165cps, Betas: 510cps
- The total number of counts are  
Ntot(imp)=519953, Ntot(bet)=2669375

Zoom on the difference of timestamps between successive events

Implants (ID=4)



Betas (ID=5)

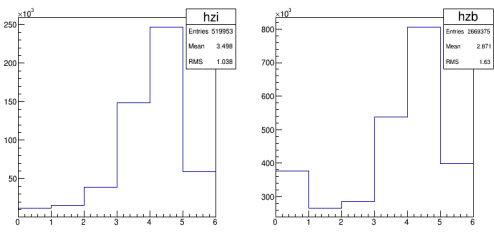


Observations:

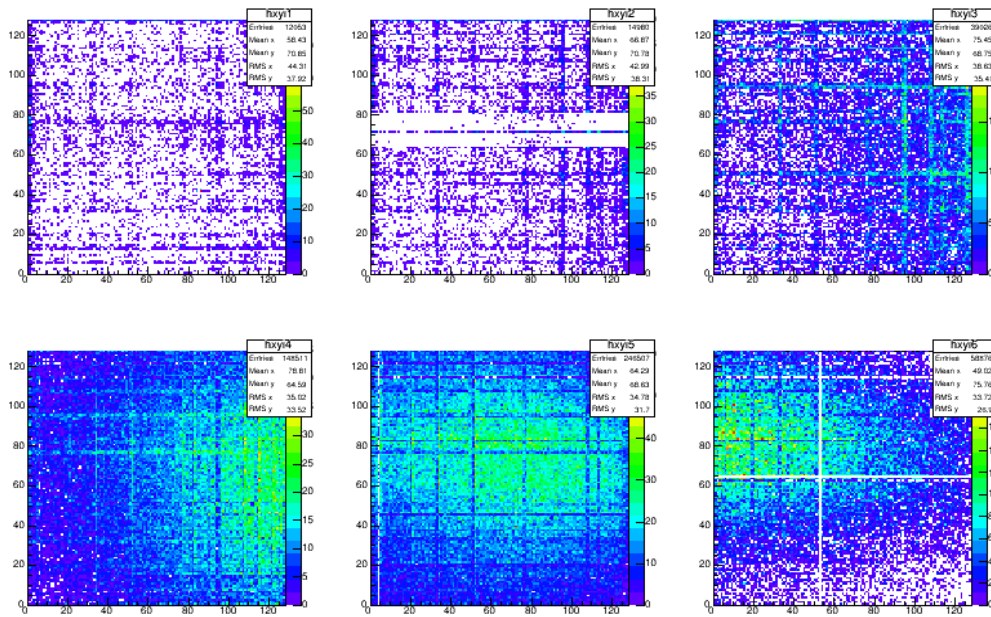
- There is a lower cut in dT of 25us for implants, none for betas
- There is a concentration of dT at very small values: below 40us for implants and 8us for betas
- After this peak there is a depression in the dT spectrum for implants and a bump for betas.
- The number of counts in this peak are  
Nc(imp)=22500, Nc(bet)=819762  
this represents 4.3% and 30.7% of the respective totals
- The number of counts in the spectra excluding the lowest dT < 60us:  
N(imp)=496849, N(bet)=1734589  
(3.5 betas/implant)

# Spatial distribution of implants and betas

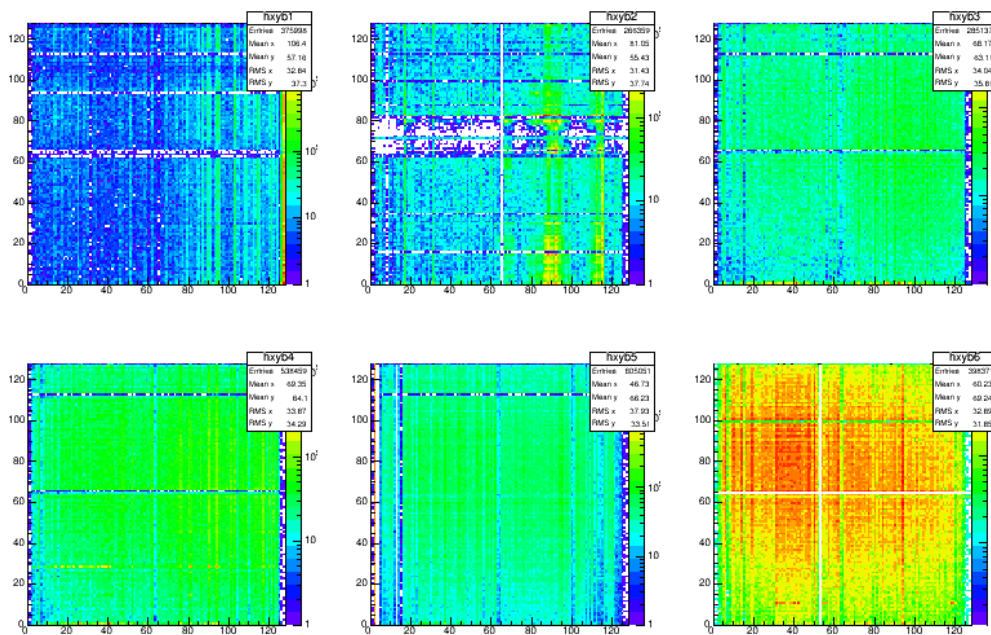
Z:                    imp                                    bet



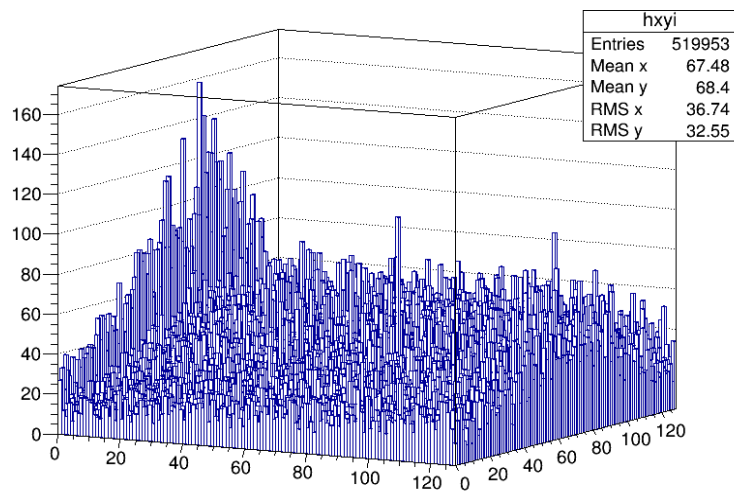
XY imp (lin): 1-6



XY bet (log): 1-6



XY imp all:

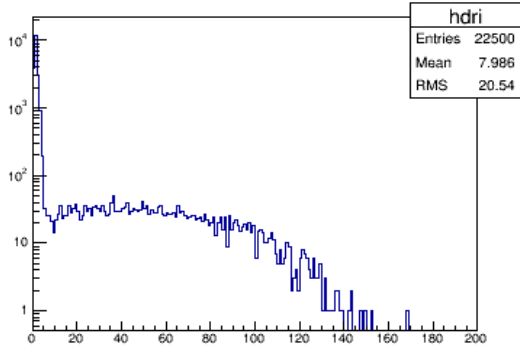


Observations:

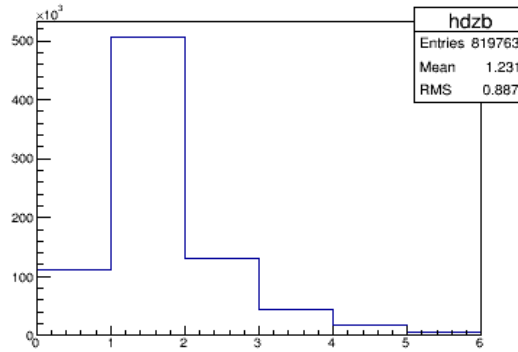
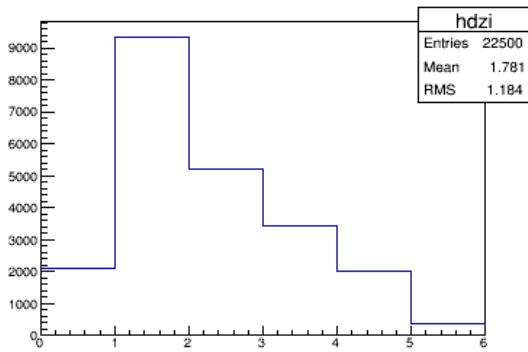
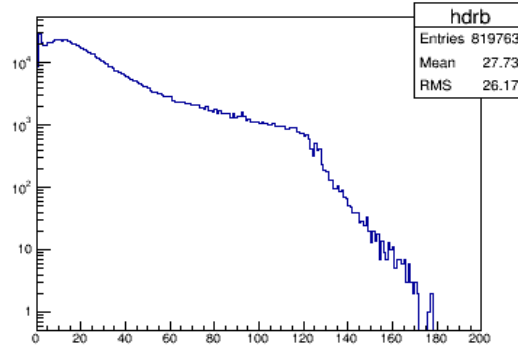
- Most implants and betas are in DSSD #5
- The transverse implantation distribution is very broad. We were hitting things outside AIDA (!).

Spatial correlation of the successive events in the dT peak.  
 Implants:  $dt < 40\mu s$ . Betas:  $dt < 8\mu s$   
 Top: distance in XY plane (in strip units)  
 Bottom: distance in Z axis (in DSSD units)

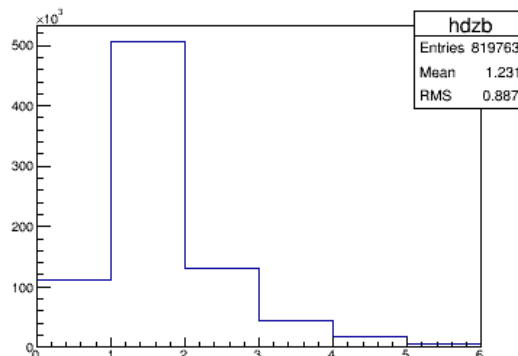
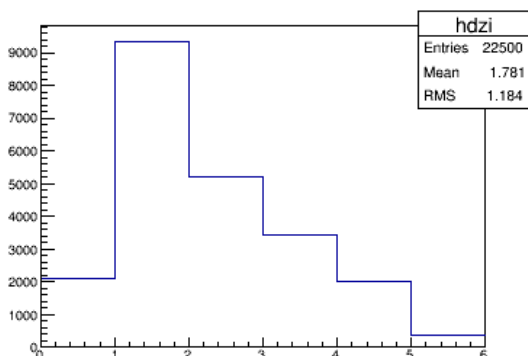
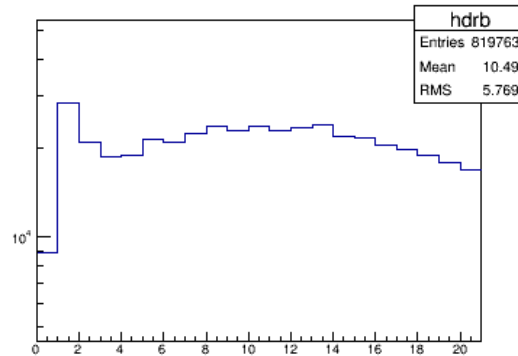
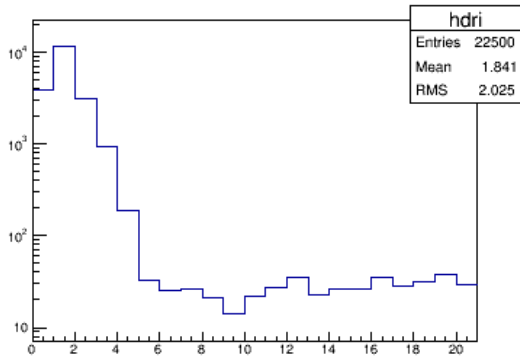
Implants (ID=4)



Betas (ID=5)



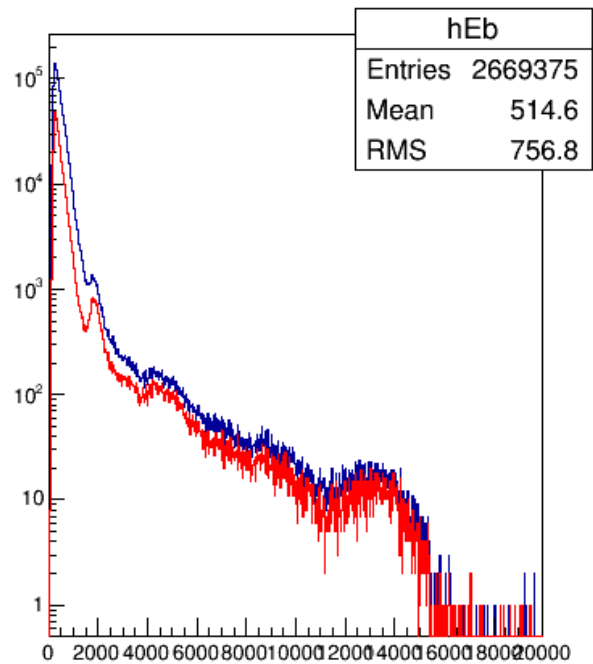
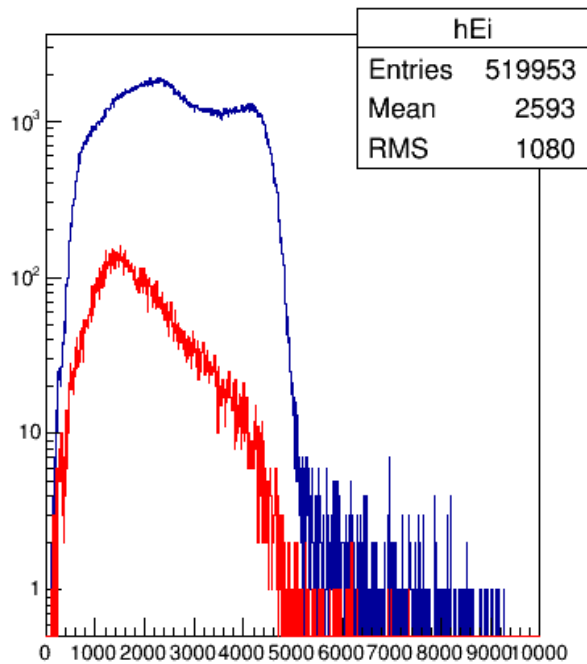
Zoom on distance in XY plane:



Observations:

- The distance in XY for implants is concentrated for  $dr < 6$  (maximum around 1.5). For betas there is a very broad distribution with maxima around 1 and 12 (!?).
- The distance in Z most frequent is 2 (!?) for both implants and betas. Larger distances are non-negligible.

Energy distribution of the next closely time correlated event (red) compared to the total spectrum (blue).



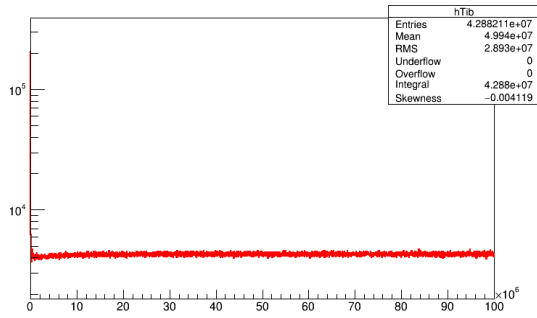
Observations:

- There is a huge difference in shape for implants but very little for betas (!?).

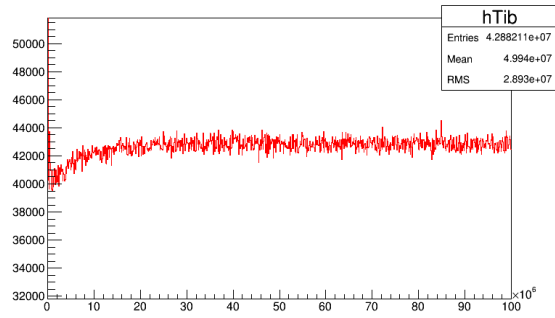


# Time correlation between implants and betas (Tbet-Timp):

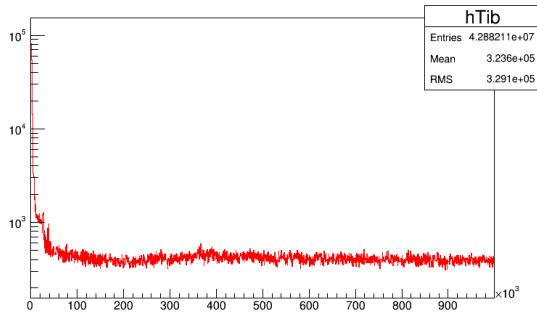
Tdiff<100ms, Log



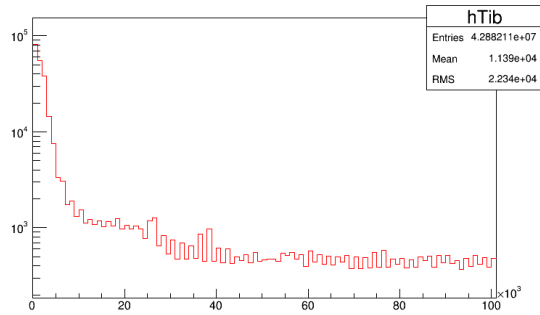
Lin



zoom 1ms



zoom 100us



## Observations:

- Peak (not decay related) below 8us. Bump up to 30us. Depression up to 300us. (!?)
- The count rate rises up to 20ms (dead time?)