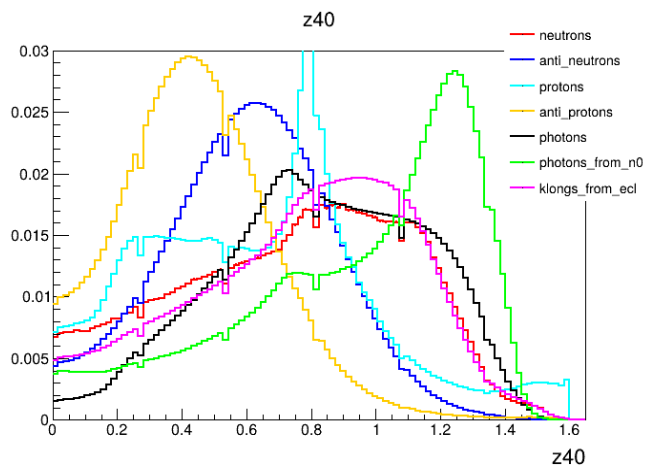


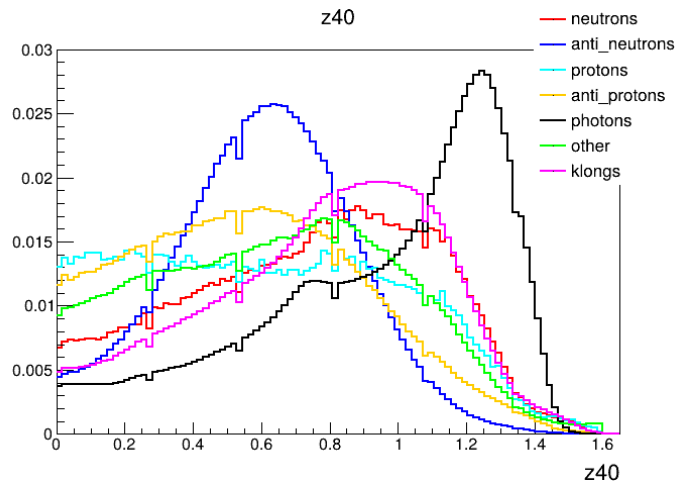
# Anti-Neutron Reconstruction at Belle II

17/02/2026

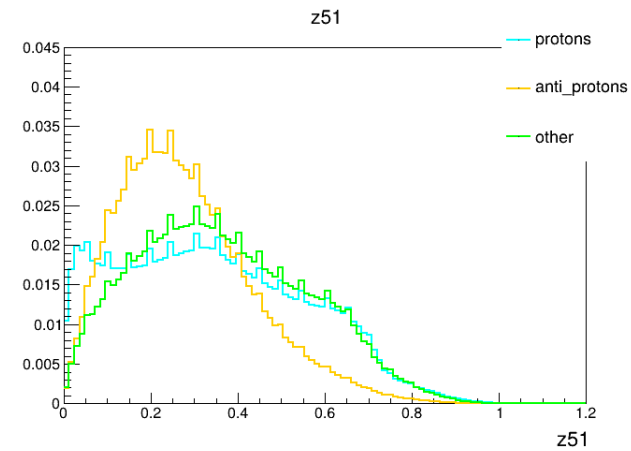
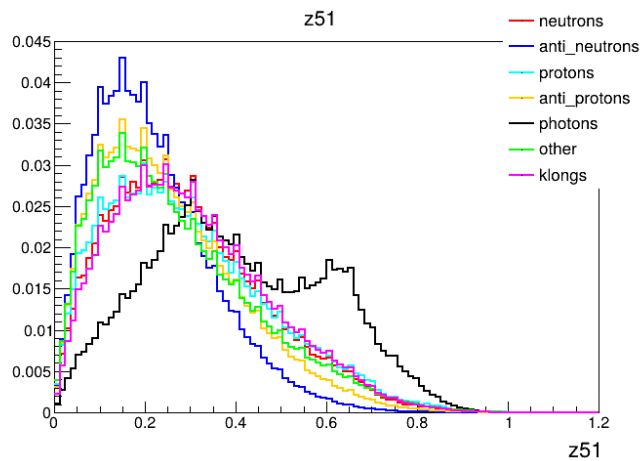
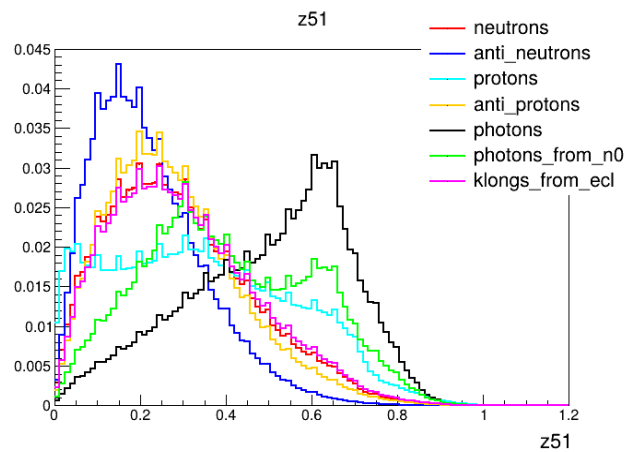
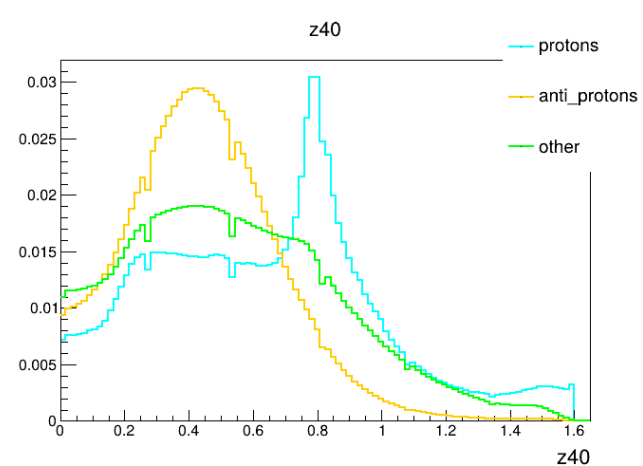
## frm seperate lists



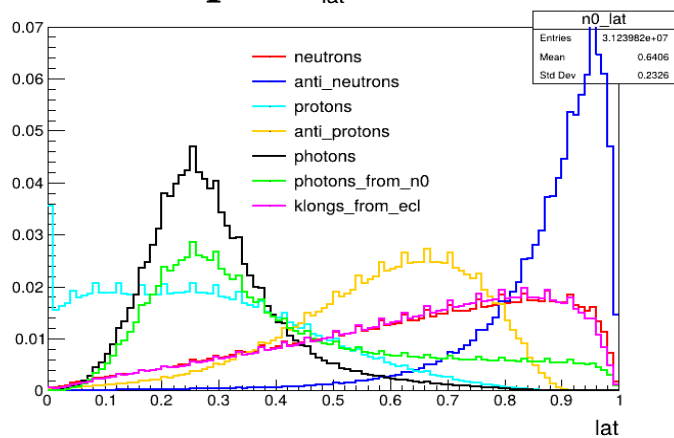
## frm anti-n0 list



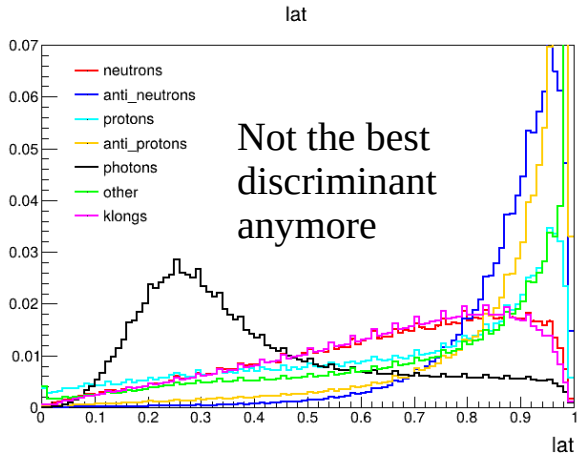
## frm anti-proton list



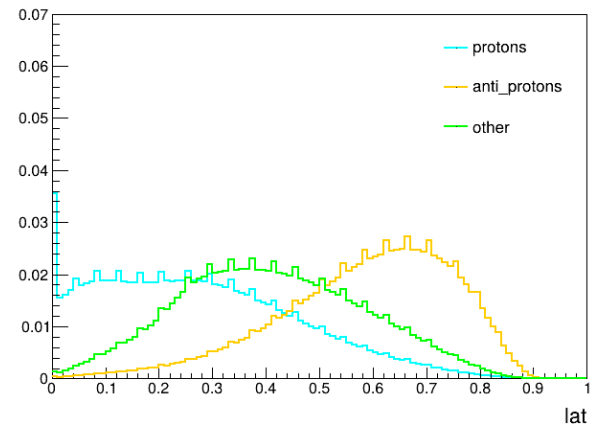
# frm seperate lists



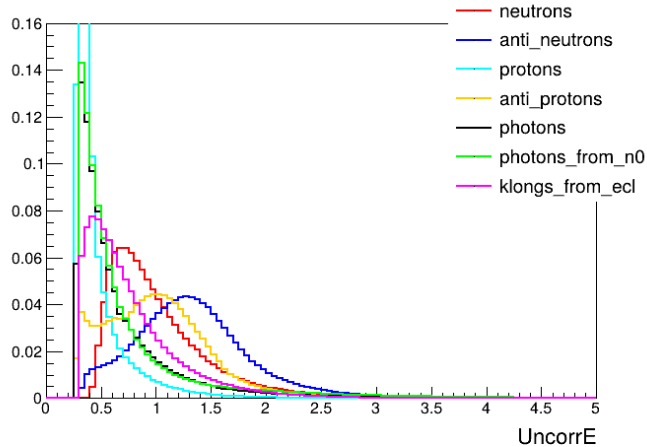
# frm anti-n0 list



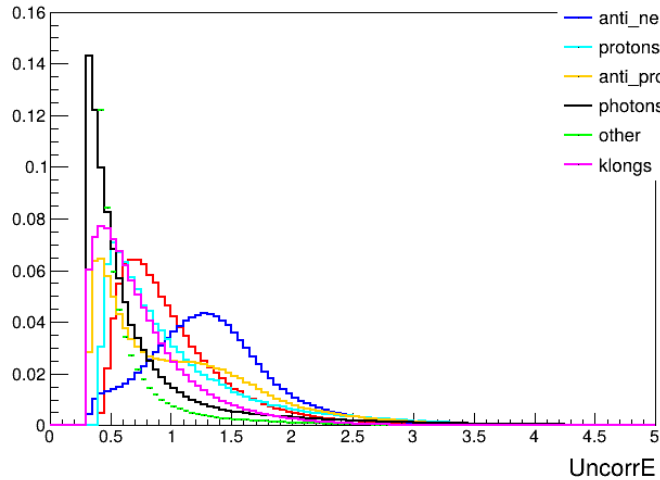
# frm anti-proton list



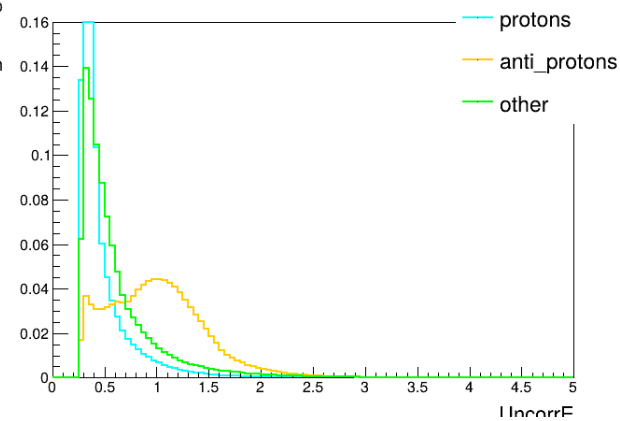
## UncorrE



## UncorrE

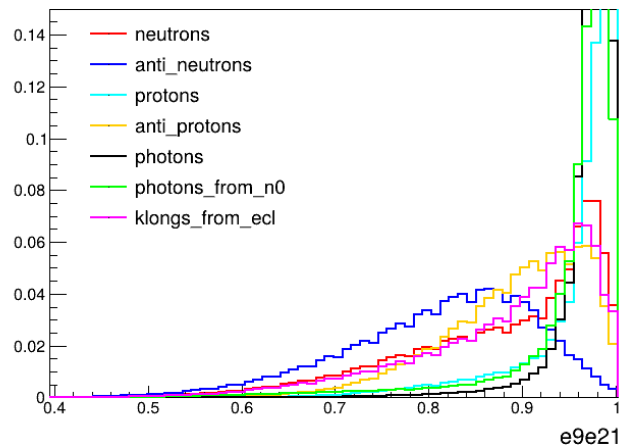


## UncorrE



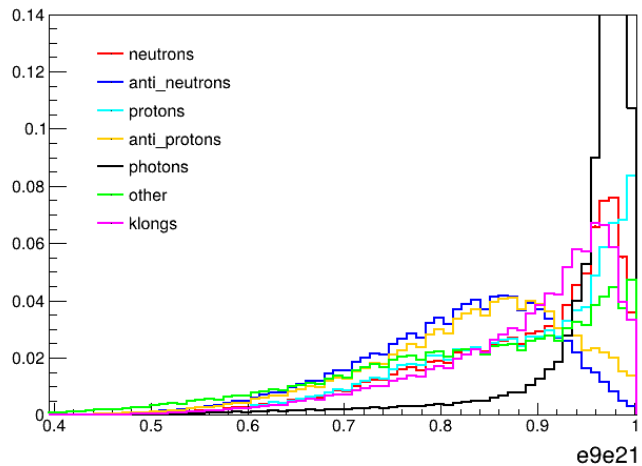
# frm seperate lists

e9e21



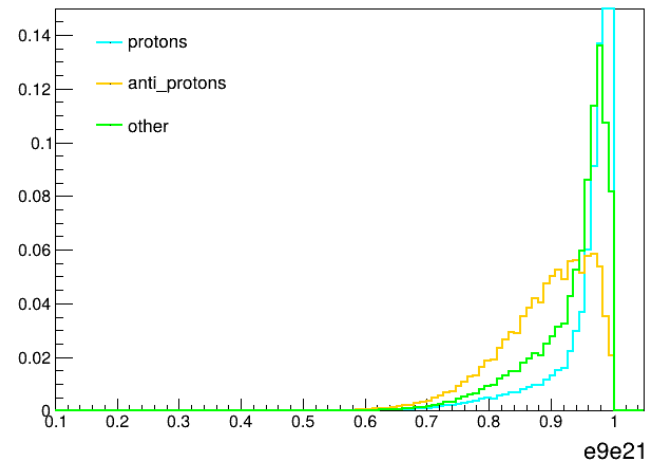
# frm anti-n0 list

e9e21

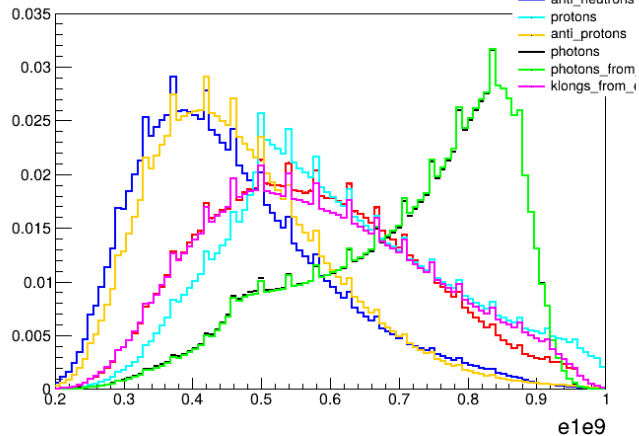


# frm anti-proton list

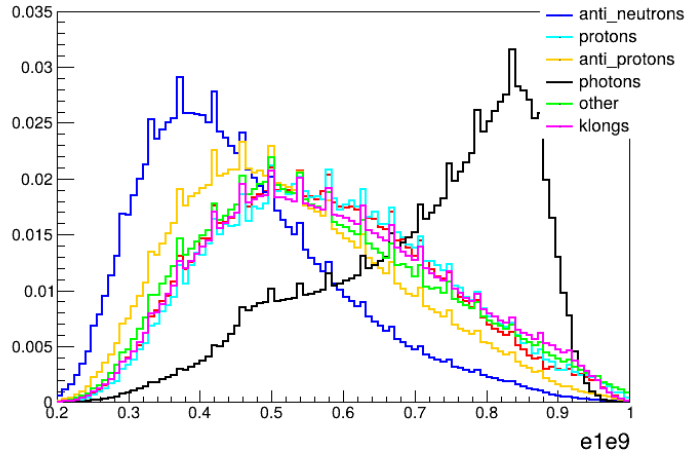
e9e21



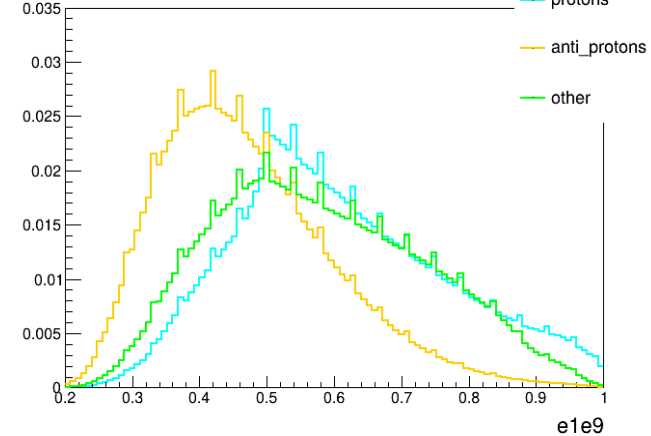
e1e9



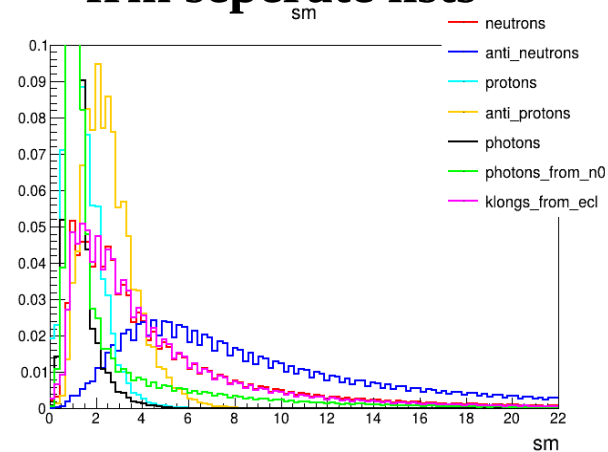
e1e9



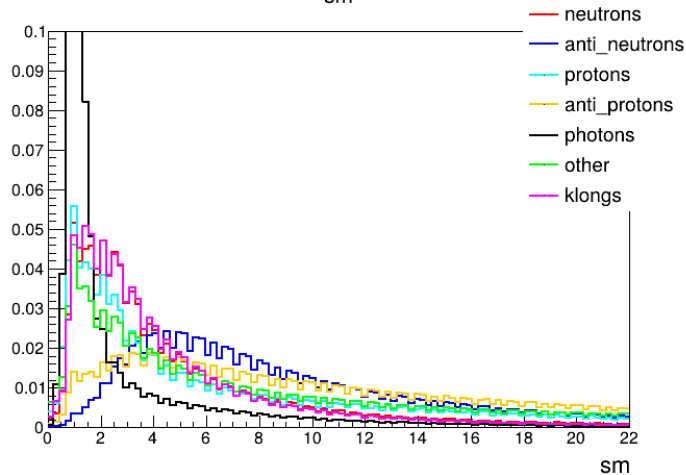
e1e9



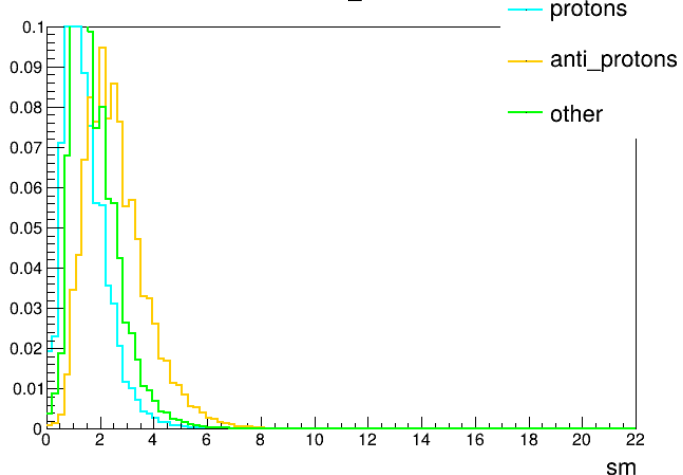
# frm seperate lists



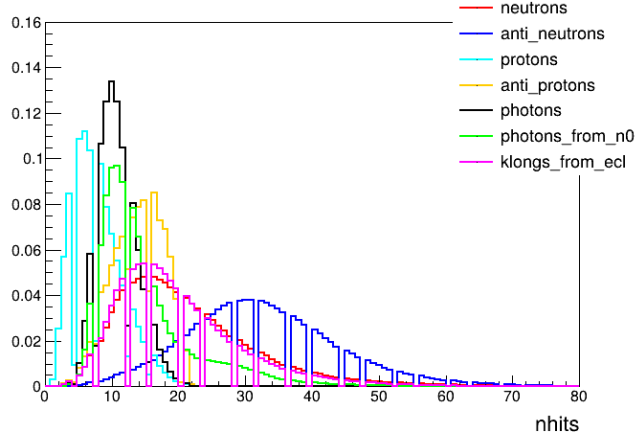
# frm anti-n0 list



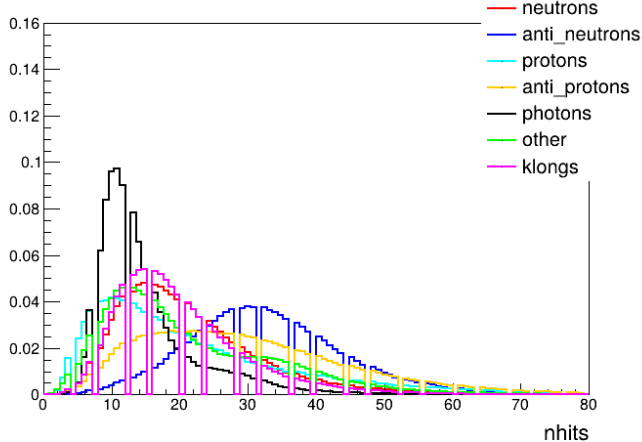
# frm anti-proton list



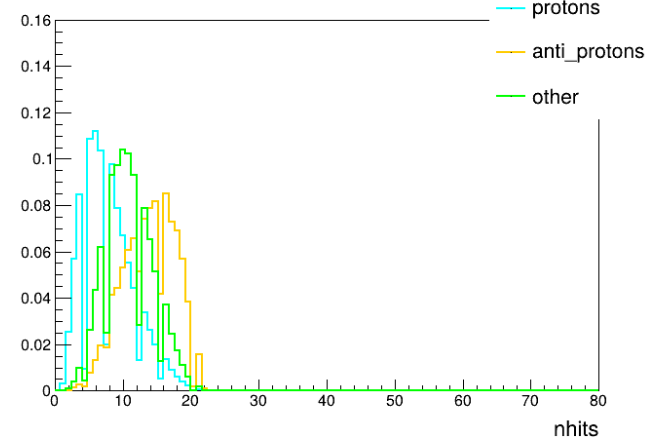
# nhits



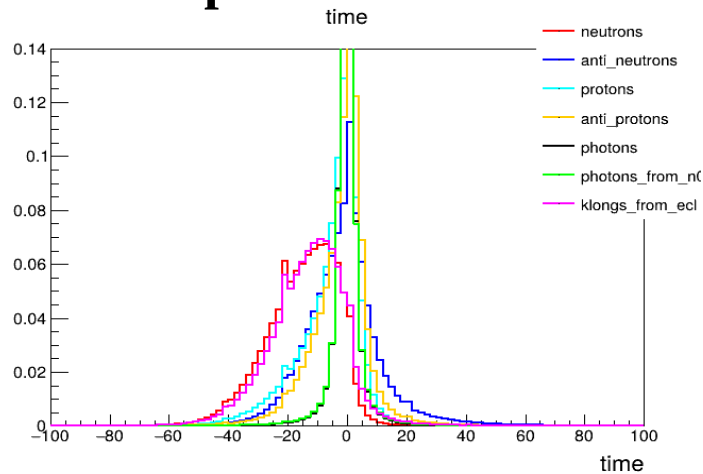
# nhits



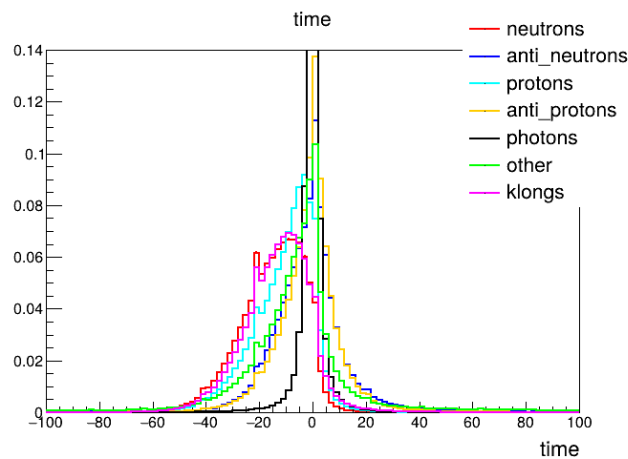
# nhits



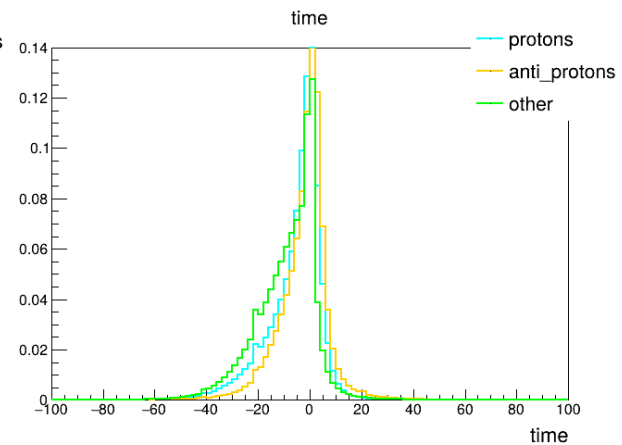
## frm seperate lists



## frm anti-n0 list



## frm anti-proton list



```

root [1] neutrons->Scan("genMotherPDG:mcPDG", "!((abs(mcPDG)==2112)|| (abs(mcPDG)==2212) || mcPDG==22 ||mcPDG==130)")
*****
*      Row      * genMother *      mcPDG *
*****
*          7 *          0 *      nan *
*         13 *          0 *      nan *
*         32 *          0 *      nan *
*         35 *         113 *     -211 *
*         52 *          0 *      nan *
*         53 *         313 *     -211 *
*         54 *          0 *      nan *
*         56 *          0 *      nan *
*         59 *          23 *     -321 *
*         60 *          0 *      nan *
*         61 *         310 *      211 *
*         71 *          0 *      nan *
*         72 *          22 *        11 *
*         75 *          0 *      nan *
*         86 *        -323 *     -211 *
*         90 *          23 *     -211 *
*         92 *         310 *     -211 *
*        100 *          0 *      nan *
*        105 *          0 *      nan *
*        108 *          0 *      nan *
*        116 *          0 *      nan *
*        118 *          0 *      nan *
*        128 *          0 *      nan *
*        130 *          0 *      nan *
*        131 *          0 *      nan *

```

**Other than (anti)neutrons, (anti)protons, photons and Klongs, the remaining are mostly *nan* candidates.**

```
root [2] neutrons->Scan("genMotherPDG:mcPDG", "((abs(mcPDG)==2112) || (abs(mcPDG)==2212) || mcPDG==22 || mcPDG==130)")
```

```
*****  
*      Row      * genMother *      mcPDG *  
*****  
*          0 *          111 *          22 *  
*          1 *          111 *          22 *  
*          2 *          111 *          22 *  
*          3 *          111 *          22 *  
*          4 *          111 *          22 *  
*          5 *          111 *          22 *  
*          6 *          111 *          22 *  
*          8 *         -2212 *          22 *  
*          9 *          130 *          22 *  
*         10 *          221 *          22 *  
*         11 *          311 *         130 *  
*         12 *          331 *          22 *  
*         14 *          221 *          22 *  
*         15 *          221 *          22 *  
*         16 *           11 *          22 *  
*         17 *          111 *          22 *  
*         18 *          111 *          22 *  
*         19 *          111 *          22 *  
*         20 *          211 *          22 *  
*         21 *         -211 *          22 *  
*         22 *         -211 *          22 *  
*         23 *          111 *          22 *  
*         24 *          221 *          22 *  
*         25 *          111 *          22 *  
*         26 *          111 *          22 *  
Type <CR> to continue or q to quit ==>  
*         27 *          111 *          22 *  
*         28 *          111 *          22 *  
*         29 *          111 *          22 *  
*         30 *          111 *          22 *  
*         31 *          111 *          22 *  
*         33 *          111 *          22 *  
*         34 *          111 *          22 *  
*         36 *          111 *          22 *  
*         37 *          111 *          22 *  
*         38 *          111 *          22 *  
*         39 *         -3122 *         -2112 *  
*         40 *         -3122 *         -2112 *
```

**(anti)neutrons, (anti)protons, photons  
and Klongs are reconstructed in the  
n0 list.**

```
root [1] protons->Scan("genMotherPDG:mcPDG", "( (abs(mcPDG)==2112) || (abs(mcPDG)==2212) || mcPDG==22 || mcPDG==130) ")
```

```
*****
```

```
*      Row      * genMother *      mcPDG *
```

```
*****
```

```
*      34 *      211 *      2212 *
*      44 *      23  *      2212 *
*      88 *     -3122 *     -2212 *
*      91 *      23  *      2212 *
*      97 *      321 *      2212 *
*     118 *     -2224 *     -2212 *
*     120 *      23  *      2212 *
*     121 *      23  *      2212 *
*     129 *     -2214 *     -2212 *
*     130 *      3222 *      2212 *
*     146 *      3122 *      2212 *
*     154 *      211 *      2212 *
*     161 *      23  *     -2212 *
*     180 *     -3122 *     -2212 *
*     187 *      23  *     -2212 *
*     190 *      2224 *      2212 *
*     206 *      23  *     -2212 *
*     236 *      23  *      2212 *
*     237 *      23  *      2212 *
*     243 *      3122 *      2212 *
*     245 *      3122 *      2212 *
*     323 *     -3222 *     -2212 *
*     325 *      23  *     -2212 *
*     330 *     -3122 *     -2212 *
*     340 *      23  *     -2212 *
```

**Only, (anti)protons. There are no (anti)neutrons or Klongs, etc.**

```
root [3] protons->Scan("genMotherPDG:mcPDG", "!((abs(mcPDG)==2112)|| (abs(mcPDG)==2212)|| mcPDG==22 ||mcPDG==130)")
```

```
*****
```

* Row *	* genMother *	* mcPDG *
* 0 *	* 310 *	* -211 *
* 1 *	* 23 *	* 211 *
* 2 *	* 310 *	* 211 *
* 3 *	* 310 *	* -211 *
* 4 *	* -313 *	* 211 *
* 5 *	* 23 *	* -321 *
* 6 *	* 113 *	* -211 *
* 7 *	* 310 *	* 211 *
* 8 *	* 22 *	* -11 *
* 9 *	* 23 *	* -211 *
* 10 *	* 310 *	* 211 *
* 11 *	* 23 *	* -321 *
* 12 *	* 23 *	* 211 *
* 13 *	* -213 *	* -211 *
* 14 *	* -213 *	* -211 *
* 15 *	* 310 *	* 211 *
* 16 *	* 23 *	* -321 *
* 17 *	* 23 *	* -321 *
* 18 *	* 113 *	* -211 *
* 19 *	* 113 *	* -211 *
* 20 *	* 23 *	* -321 *
* 21 *	* 213 *	* 211 *
* 22 *	* 313 *	* -211 *
* 23 *	* 313 *	* 321 *
* 24 *	* 22 *	* 11 *

**Remaining candidates are mostly charged tracks, not nan candidates, unlike the neutron list.**