

Exercises

- 1) Book a new histogram for the measured energy distribution in the calorimeter. Introduce an energy smearing ($\sigma E/E=2\%$) to define variable `Emeas` (use `TRandom` case already defined)
- 2) Display the hits of the silicon tracker planes in the X-Z projection (vertex and inner tracker) for Nitrogen fragments and then for protons (few events)
- 3) Create an energy-weighted 2D histo to display the hit map in calorimeter (11row*11col)
- 4) Create an histogram of particles (using `FlukaID`) escaping from the calorimeter using the crossings information

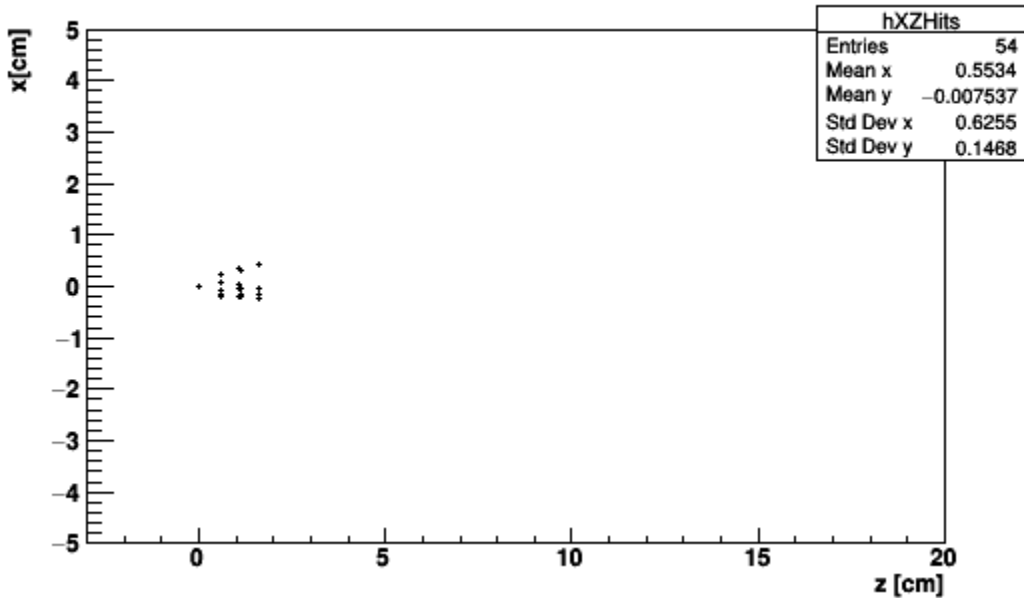
Exercise 1

```
//energy smearing
if(EnCalo > 0.){
  for(int ii=0;ii<pevstr->ncry;ii++){
    sigma_energia = EnCalo*0.02; //sigmaE/E = 2%
    Emeas = caso.Gaus(EnCalo,sigma_energia);
  }
}
else{
  Emeas = 0;
}
```

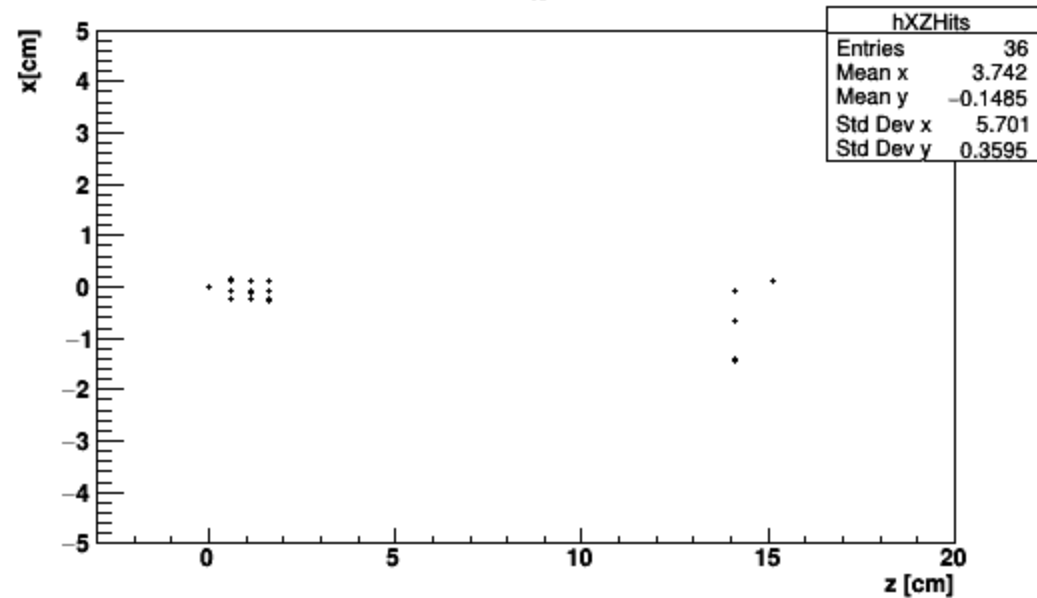
Exercise 2

```
int ipart_pointVTX,ipart_pointIT;  
  
for(int i=0;i<pevstr->nvtx;i++){  
  ipart_pointVTX = pevstr->idvtx[i]-1;  
  for(int j=0;j<pevstr->nIT;j++){  
    ipart_pointIT = pevstr->idIT[j]-1;  
  
    if ( ipart_pointVTX==ipart_pointIT ){  
      //if ( pevstr->trcha[ipart_pointVTX]==7 ){//Nitrogen  
      if ( pevstr->trfid[ipart_pointVTX]==1 ){//Protons  
        ((TH2D*)gDirectory->Get("TRACKERS/hXZHits"))->  
          Fill(pevstr->zinvtx[i],pevstr->xinvtx[i]);  
        ((TH2D*)gDirectory->Get("TRACKERS/hXZHits"))->  
          Fill(pevstr->zinIT[i],pevstr->xinIT[i]);  
      }  
    }  
  }  
}
```

Hits



Hits

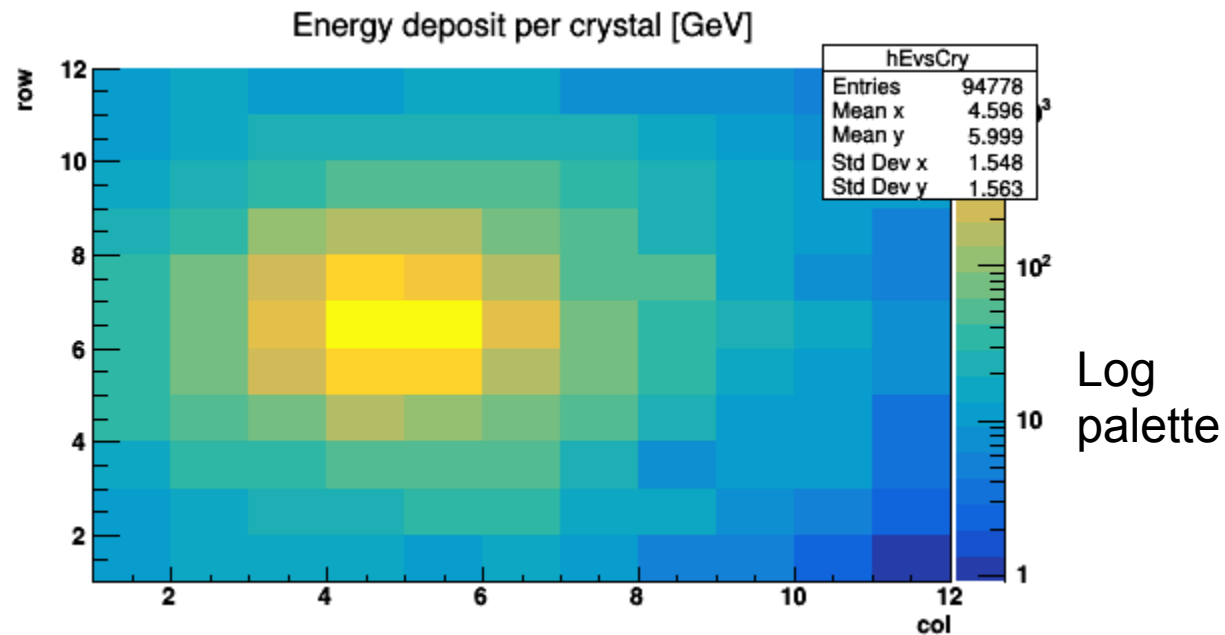


Exercise 3

```
//loop on crystal deposits
for(int i=0;i<pevstr->ncry;i++){

    //energy deposition per event
    EnCalo += pevstr->decry[i];

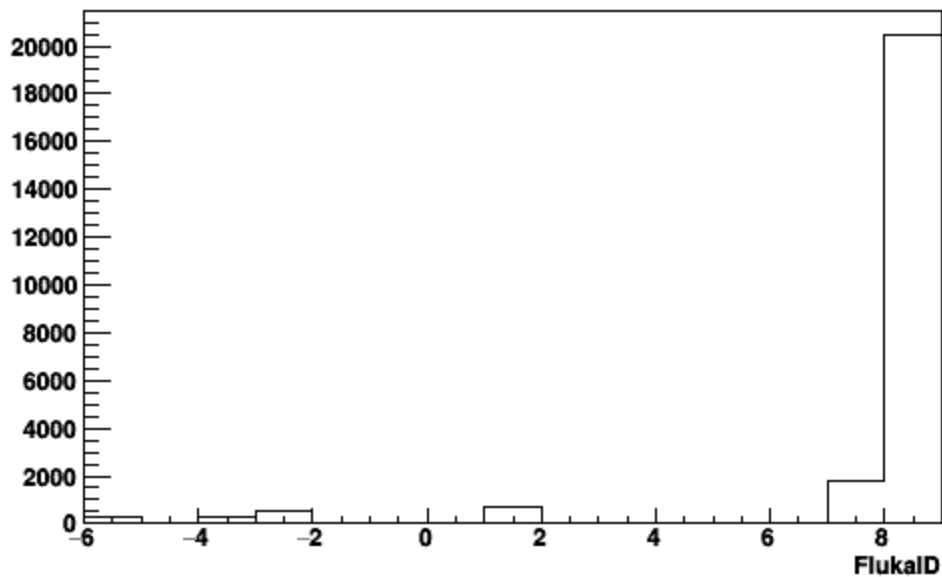
    //energy deposit per crystal
    ((TH2D*)gDirectory->Get("CRYSTAL/hEvsCry"))->
        Fill(pevstr->icolcry[i],pevstr->irowcry[i],pevstr->decry[i]);
}
}
```



Exercise 4

```
//CALORIMETER->AIR CROSSINGS  
if( (pevstr->nregoldcross[ic] >= nregcalo_first  
    && pevstr->nregoldcross[ic] <= nregcalo_last)  
    && (pevstr->nregcross[ic] == nregair) ){  
    ((TH1D*)gDirectory->Get("CRYSTAL/hPartOutCalo"))->  
    Fill(pevstr->trfid[ipart_pointer]);  
}
```

Particles escaping from calo



Particles escaping from calo

