
weekly meeting

J-PARC E73 2nd, E80

Status report about BLDC and CDC analysis,
Modified plan about my Master Thesis

2024/6/3 Yuto Kimura
RARIS, J-PARC E80

現状と今後の方針

- CDC ArCO2 データ解析のためにE73_2nd データでChamber解析の練習中

- BLDC

- TOT cutや1 hit eventなど、様々なカットを試して綺麗な TDCを抽出
- Drift lengthのoffset(パラメータ)を決めた
- XT curve(パラメータ)を決めた

今後

- Residualを見る
- Tracking efficiencyを求める
- beam profile、beam inclinationを見る

Analyzerでどういうことをやっているのか理解する

- CDC

- まだ何もやっていない。
- まずは色々ヒストを試してみる。

今後

- 練習のゴール

- BLDCとCDCのtrackを組み合わせてreaction pointを決定する

Contents

- Recent events
- To do
- Plan about Master Thesis
- Future events

Recent events

- E73_2nd data taking ~6/5
 - Helium-4 done
 - Hydrogen done
 - Helium-3 done ~40% of our goal
- CDC meeting @Tateyama today
- E80 meeting @RIKEN 6/12, 13
- GPPU_2nd application 7/16~7/19
- JPS meeting manuscript ~7/23

BLDC analysis

- Aim : Be familiar with analyzer via deciding the reaction point
- What I want to do
 - explain a path to make tracks
- What I did
 - nothing ...

CDC analysis

- Aim : Be familiar with CDC analyzer
- What I want to do
 - decide the parameters (Drift length offset, XT curve)
- What I did
 - nothing ...

- Tracking efficiency
- Kaon profile at Final Focus point (FF)
- Briefly say, understand a part of tracking in the analyzer

- Tracking efficiency
- Kaon profile at Final Focus point (FF)
- Briefly say, understand a part of tracking in the analyzer

```
#if TRACKING
DCAna->MakePairsAll();
{
    for(int ichm=0;ichm<nchm2;ichm++){
        int kChm=kchm[ichm];
        TString tmpname=chmname[kChm];
        int cid =chmid[kChm];
        // LocalTrack* track=DCAna->GetTrack(cid,itr);
        // #if 0
        int st;
        int nt;
        hist::H1
        hist::H1
        if(KAON)
            hist
        if(KAON) #endif
            hist
        hist::H1(tmpname+"_time", track->GetTrackTime(),2000,-200,200);
        hist::H1(tmpname+"_timerms",track->GetTrackTimeRMS(),1000,0,200);
    }
    if CLUSTER
        tmpadd
        if(Sing
        for( i
        int i
        for(
        hist::H1(tmpname+"_chi2yz",track->chi2yz(),1000,0,100);
        double x,y;
        hist
        track->XYLocalPosatZ(0,x,y);
        hist::H2(tmpname+"_XYLocal",x,y,posbins2);
        hist::H2(tmpname+"_AB",track->gdx(),track->gdy(),100,-0.1,0.1,100
--UU-:----F1
--UU-:----F1 UserDC.cc 62% L435 (C++/l Abbrev) -----
```

```
0.1);
    for(int xy=0;xy<2;xy++){
        for(int i=0;i<track->nhit(xy);i++){
            double resid=track->resid(xy,i);
            int layer=track->layer(xy,i);
            hist::H1(tmpname+"_resid"+Form("_layer%d", layer ), resid, residbin\
s);
            hist::H2(tmpname+"_EvNum_dE"+Form("_layer%d", layer ),event_number\
, resid, evresidbins);
```

```
switch(cid){
case DetIdBLC1:
case DetIdBLC1a:
case DetIdBLC1b:
    track->XYPosatZ(0,x,y);
    hist::H2(tmpname+" XY",x,v.posbins2);
    for(int i2=0;i2<n2;i2++){
        DCCluster* cl=DCAna->GetCluster(cid,xy,i1,i2);
        if(cl->nhit()==2){
            TString clstr=Form("_cluster%d%d",xy,i1);
            for(int iadd=0;iadd<(int)tmp padd.size();iadd++){
                hist::H1(tmpname+"_time"+clstr,cl->ti\
ne(),1000,-100,400);
                hist::H1(tmpname+"_timesub"+clstr,cl->ti\
nesub(),1000,-250,250);
                hist::H1(tmpname+"_ctime"+clstr,cl->ct\
ime(),1000,-100,400);
                hist::H2(tmpname+"_timesub_time"+clstr,cl->ti\
nesub(),100,-200,200,100,-100,400);
                hist::H2(tmpname+"_timesub_ctime"+clstr,cl->ti\
nesub(),cl->ctime(),100,-200,200,100,-100,400);
            }
        }
    }
}
#endif
for(int itr=0;itr<ntra;itr++){
```

Plan about Master Thesis

list up 足りないもの

- Jul. 2~
 - CDC will arrive at J-PARC (準備棟).
 - Jul. 22~
 - Make daisy chains, attach it the CDC
 - Aug. Sep. Oct.
 - Attach Circuit board
 - HV
 - fell down to the ground
 - aging (goal : $\neq \sim 1 \text{ um}$)
 - connect ASD to a part of the boards
 - Noise reduction
 - Gas leak check
 - analog signal check with checking source
 - Data taking by cosmic ray with a part of layers
 - Dec.
 - After the E73, data taking by cosmic ray using the repeaters and cables of current CDC
- ArCO2 analysis by current CDC using cosmic data
 - Simulation by Garfield++
 - Gas Gain...
 -
- write my master thesis

Future events

- Tateyama 6/10~11
- RIKEN 6/12~(13)
- Sendai 6/13~7/20
- Tokai 7/21~8/3 ← GPPU exam between this period
- Sendai 8/4~8/7
- Tokai 8/18~9/13
- Sendai 9/14
- JPS in Hokkaido 9/15~20 ? Talk about CDC with ArCO2 (by cosmic data)
- Tokai 9/21~
- J-PARC E73_2nd (3rd) Nov.~

Questions

- Why is there a valley besides the main peak of TDC (p. 5) (H. O)
 - While output the signal from disci, the input signal is ignored.
- How are peaks explained except for the main peak? (p. 5) (H. O)
 -
- Why are Shapers (A"S"D) needed for CDC? (p. 13) (M. M)
 -

Back Up

Beam Line (J-PARC K1.8BR)

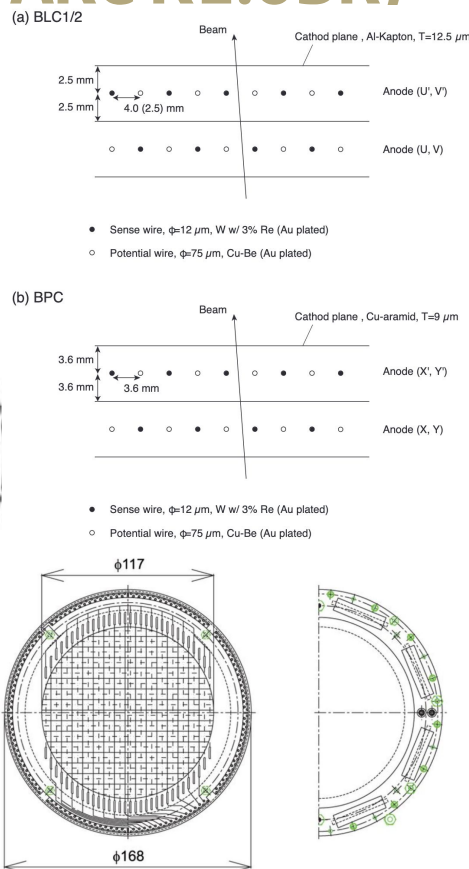
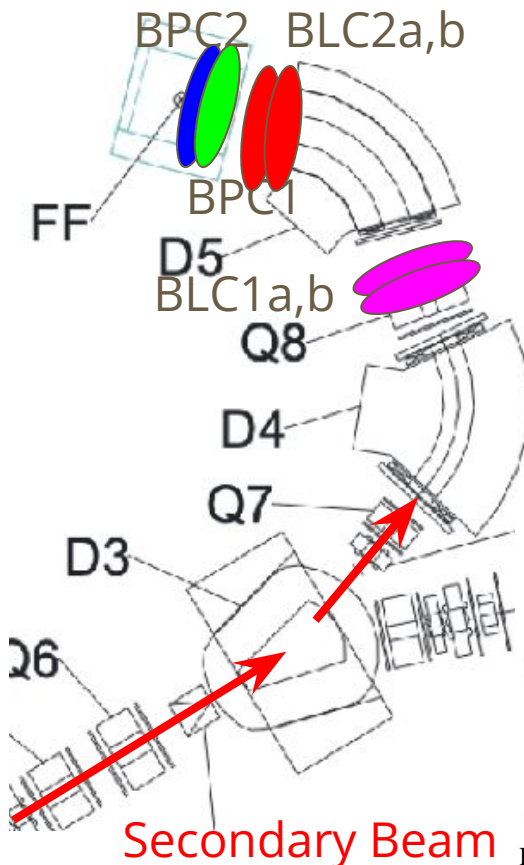


Fig. 2.6 Design of the BPC (all dimensions in mm). Taken from Ref.[60].

- The role of BLDC
 - Beam tune
 - To decide the reaction vertex
 - work together with CDC track
- Present HV (cat=pot) and Vth
 - BLC1 : 1250 V, 4.00 V
 - BLC2 : 1275 V, 3.30 V
 - BPC1 : 1450 V, 0.75 V
 - BPC2 : 1425 V, 1.05 V
- Gas
 - Ar : isoC₄H₁₀ = 4 : 1, + methylal
 - Ar 80 ml/min
- Resolution
 - about 0.1 mm