

Data Handling of RPC

Han-Bum RHEE
Korea Univ.

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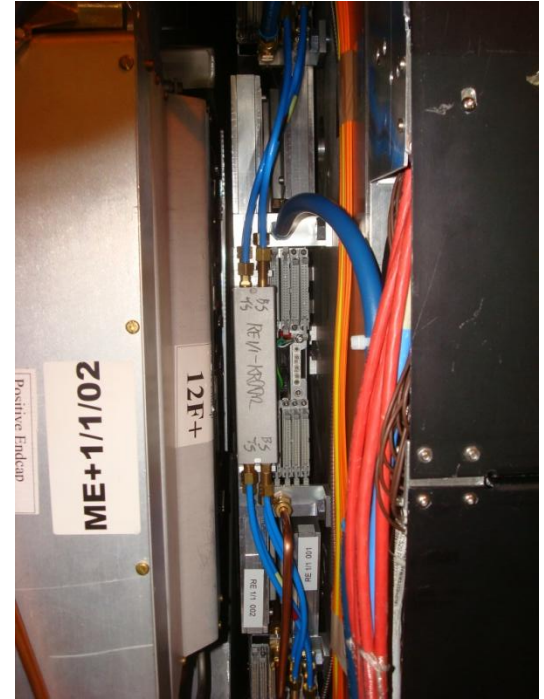
5th KR-CMS Meeting

Outline

- Introduction
- Analyzer, mac.C
- Information-GEN, SIM, DIGI, RECO
- RE1/1 project
- Summary & plan

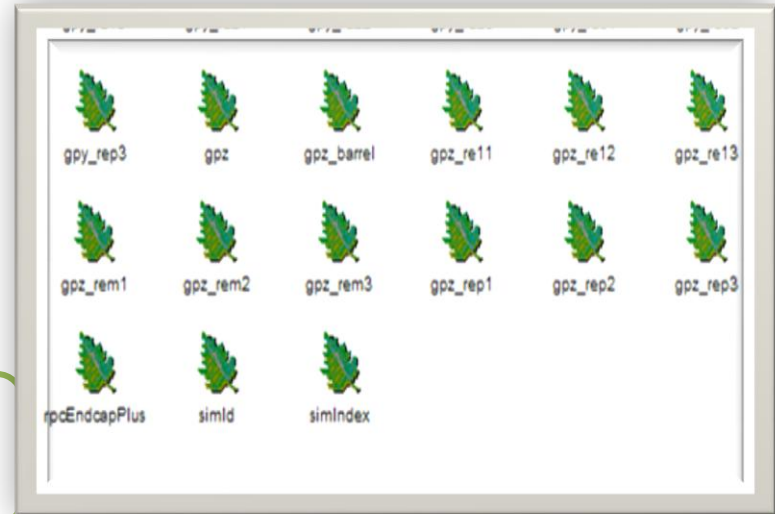
Introduction

- Finished installation of RE1/1 (except Link Board)
- Plan for LB-system of RE1/1
- Understanding to data processing for RPCs
- Study about data handling of RPCs with DPG people(Marcello Maggi)

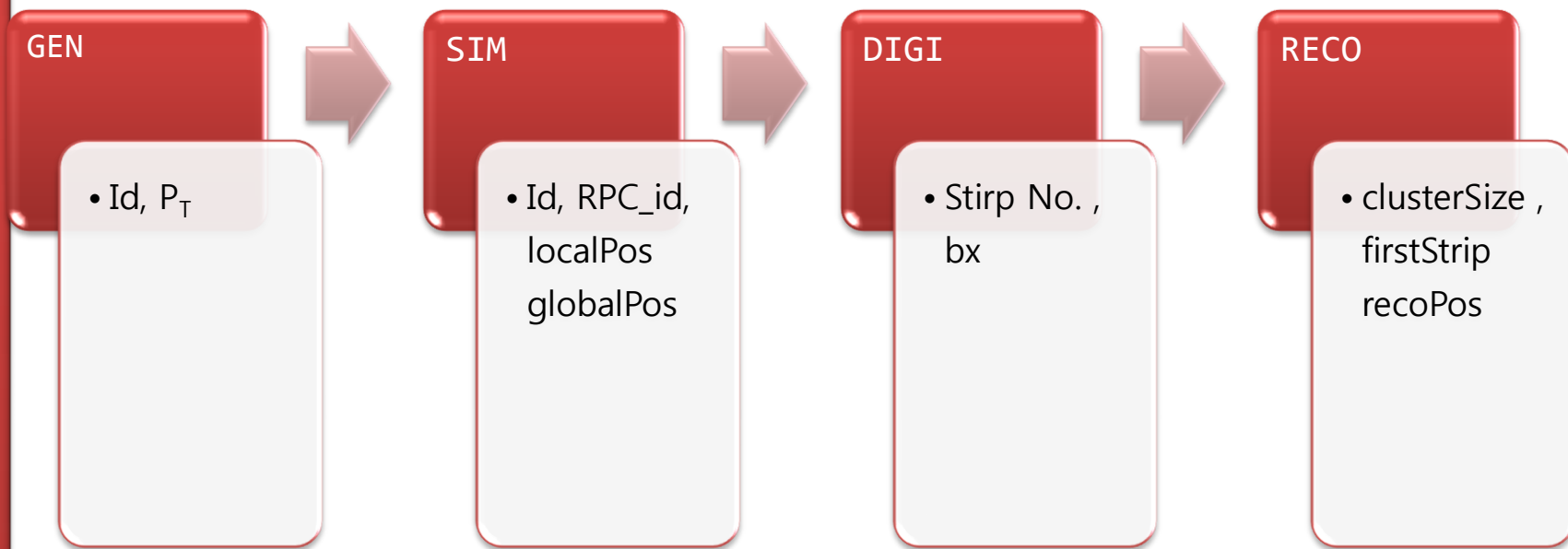


Analyzer

```
// ----- method called to for each event -----  
void  
HanBum::analyze(const edm::Event& iEvent, const edm::EventSetup& iSetup)  
{  
    using namespace edm;  
    using namespace std;  
    using namespace reco;  
  
    Handle<GenParticleCollection> genParticles;  
    iEvent.getByLabel("genParticles", genParticles);  
  
    edm::ESHandle<RPCGeometry> rpcGeom;  
    iSetup.get<MuonGeometryRecord>().get(rpcGeom);  
  
    edm::Handle<PSimHitContainer> simHit;  
    iEvent.getByLabel("g4SimHits", "MuonRPCHits", simHit);  
  
    Handle<RPCDigiCollection> rpcdigis;  
    iEvent.getByType(rpcdigis);  
  
    Handle<RPCRecHitCollection> recHit;  
    iEvent.getByLabel("rpcRecHits", recHit);  
}
```



Information



GEN : P_T
SIM : RPC_id, Global Position
DIGI: Strip No.
RECO: cluster size, first strip

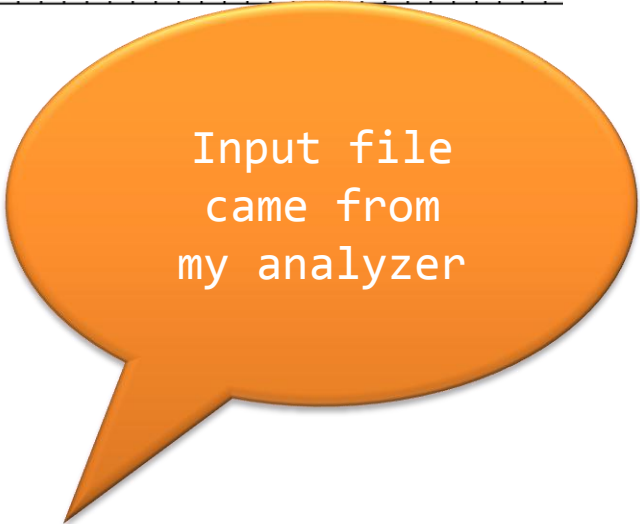
RPC.C

```
void RPC () {
    gROOT->Reset();
    gROOT->Clear();
    gROOT->SetStyle("Plain");

    gStyle->SetTextSize(0.01908148);
    gStyle->SetTitleFontSize(0.07);
    gStyle->SetOptTitle(1);
    gStyle->SetOptStat(0000);
    gStyle->SetTitleXOffset(1.1);
    gStyle->SetTitleYOffset(1.15);
    gStyle->SetPadBottomMargin(0.15);
    gStyle->SetPadLeftMargin(0.12);

    TFile *f1 = new TFile("HistSingleMu.root");
    //TFile *f1 = new TFile("HistReco1000.root");
    TNtuple *anal = (TNtuple*) f1->Get("Demo");

    TH2D *hp1 = new TH2D("hp1", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *hp2 = new TH2D("hp2", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *hp3 = new TH2D("hp3", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *hm1 = new TH2D("hm1", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *hm2 = new TH2D("hm2", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *hm3 = new TH2D("hm3", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *h11 = new TH2D("h11", "", 1400, -700, 700, 1400, -700, 700);
    TH2D *h12 = new TH2D("h12", "", 1400, -700, 700, 1400, -700, 700);
}
```



Input file
came from
my analyzer

GEN information

SingleMuPt100_cfi.py

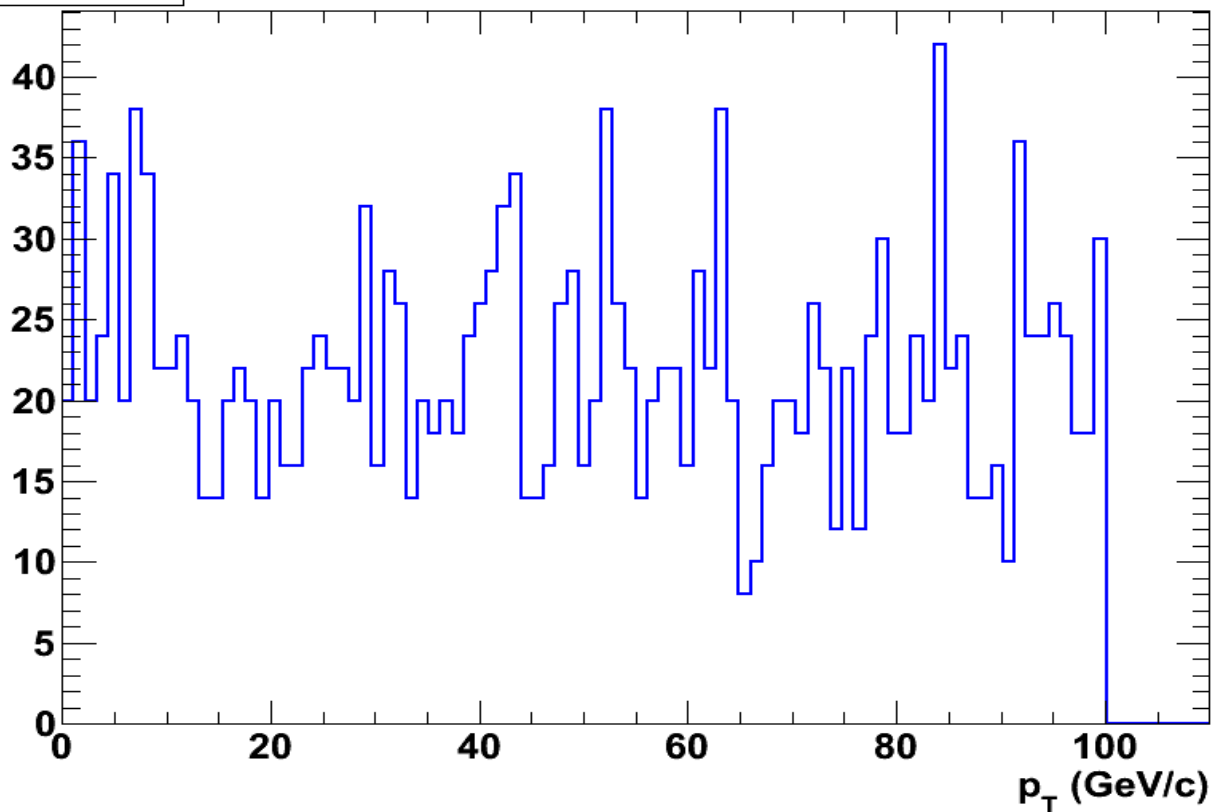
Random Pt gun

$P_T: 0.01 \sim 100.01$ GeV

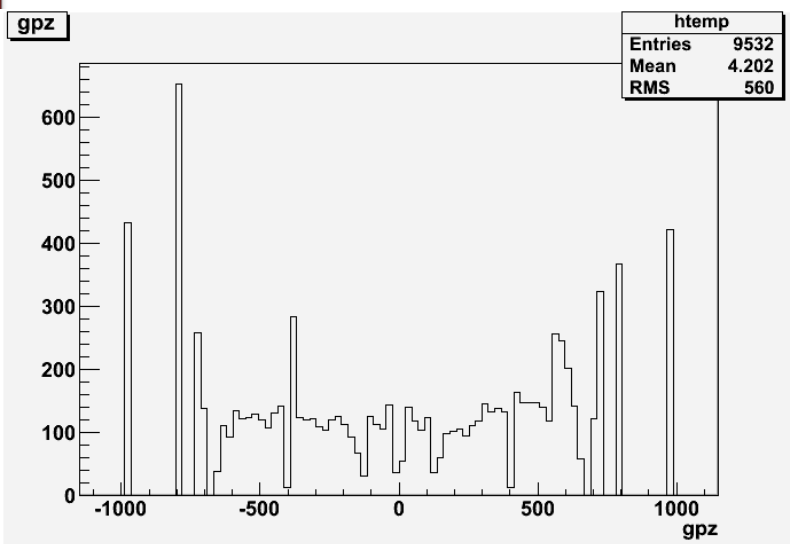
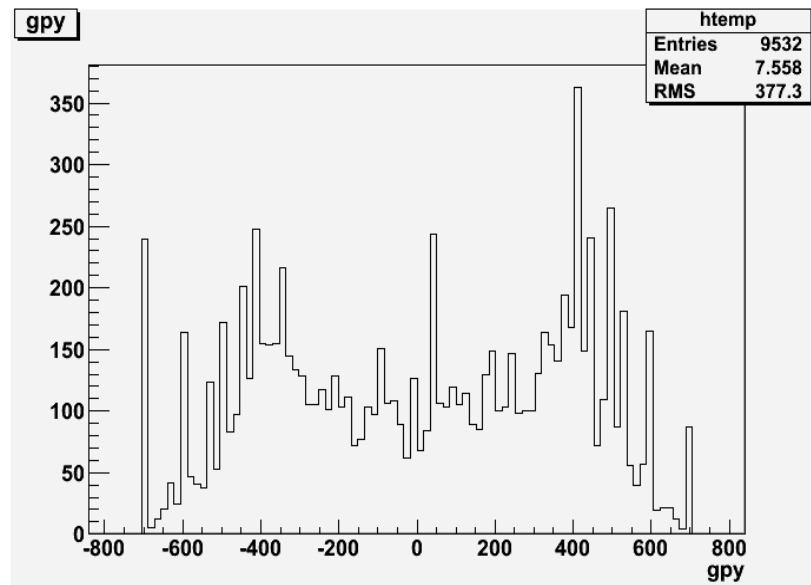
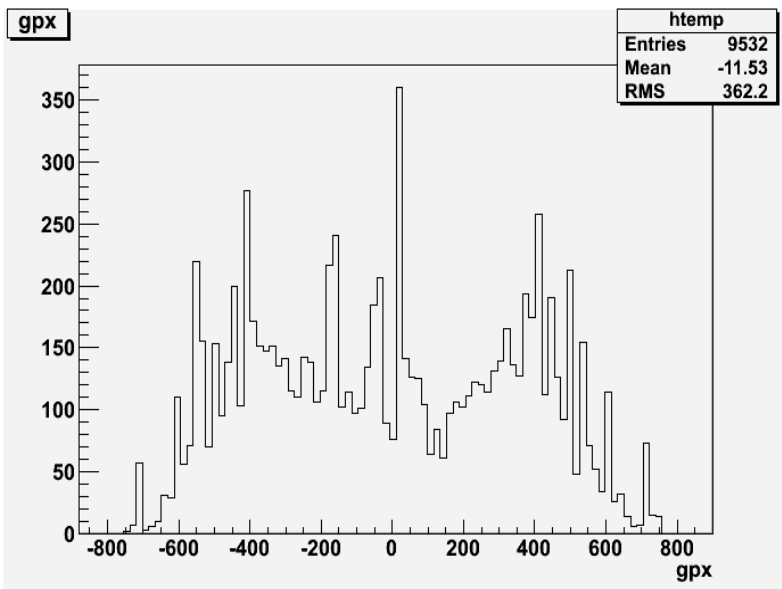
$|\eta| < 2.5$

of Events: 1000

Gen P_T



SIM information

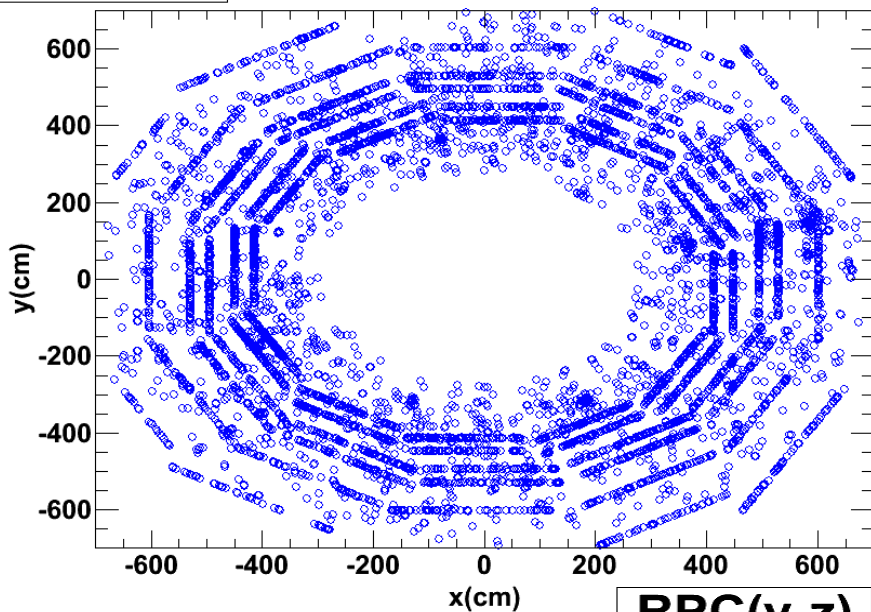


GP : information of hit position
(x, y, z, r, phi)

RPC.C  Projection 2D graph

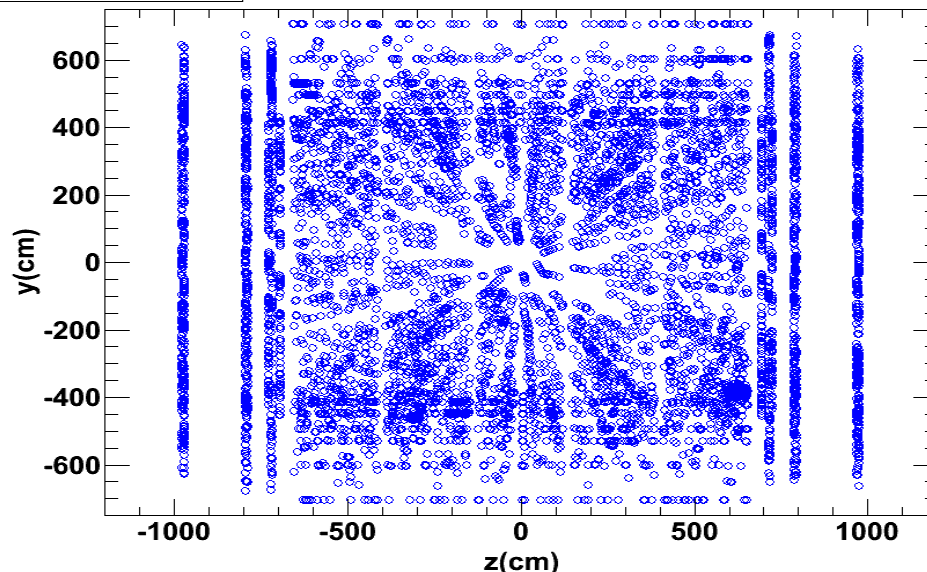
SIM information

RPC(x-y)



- Identify structure of RPC system
- Focus on endcap RPCs

RPC(y-z)



SIM information

RPC_ID

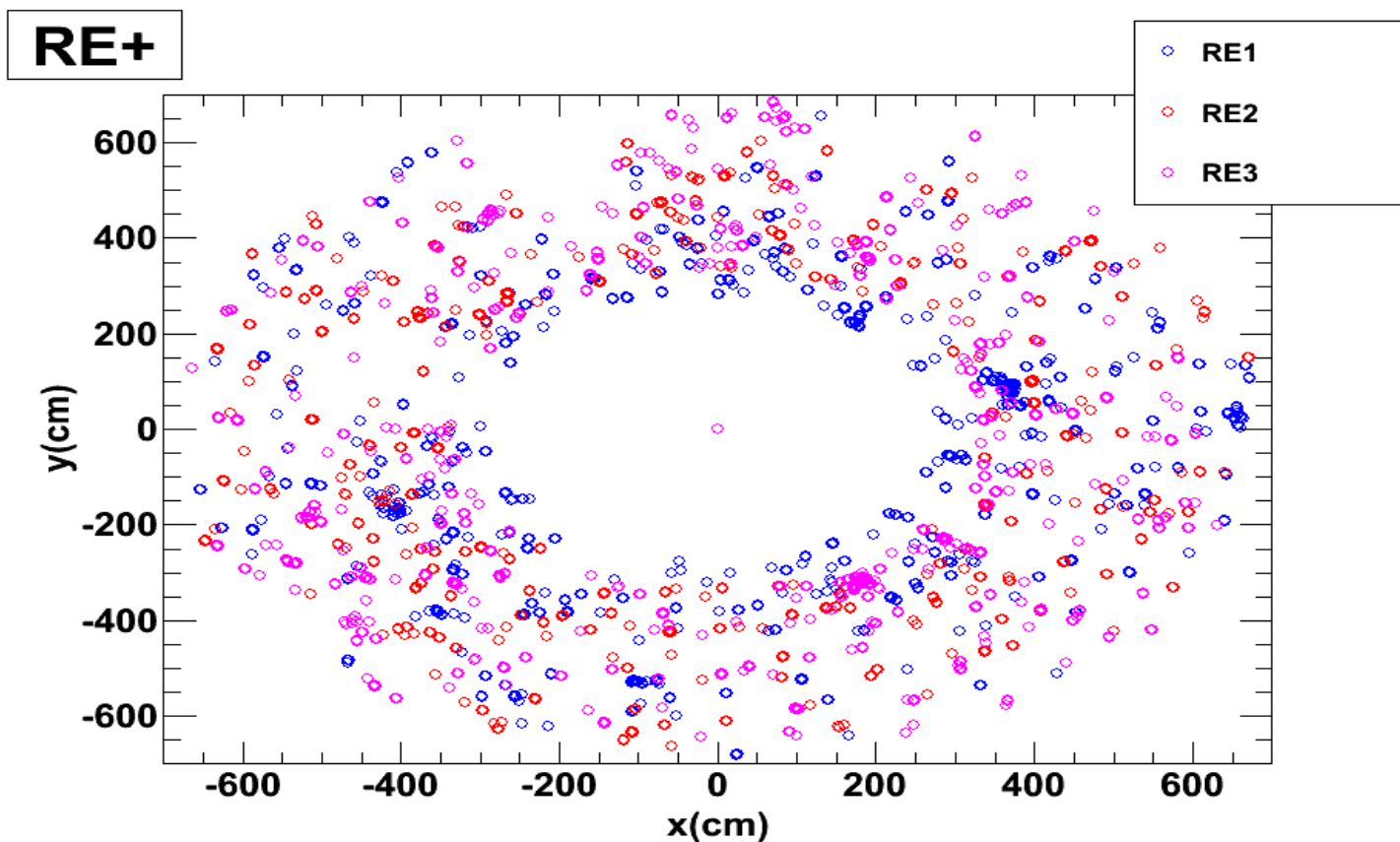
Region: barrel(0) & endcap(+/-1, -/-1)

Ring: wheel No(in barrel)

physical ring located on a disk(in endcap)

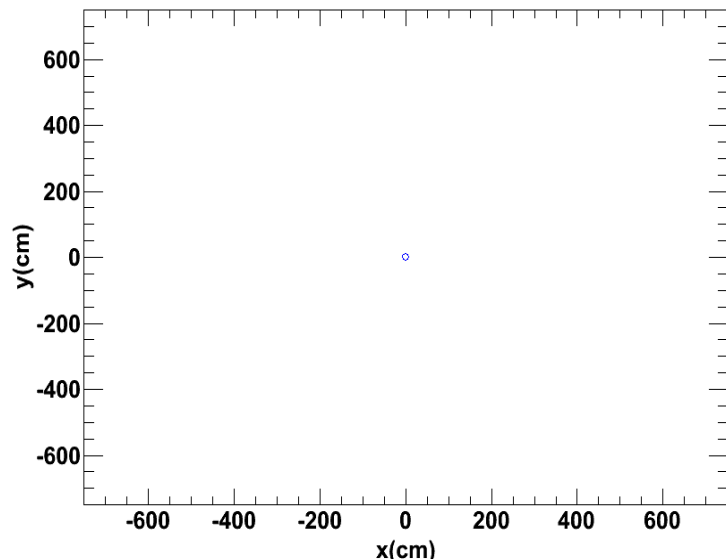
Station: the 4 group of chambers at same r(in barrel)

the 3 group of chambers at same z(in endcap)

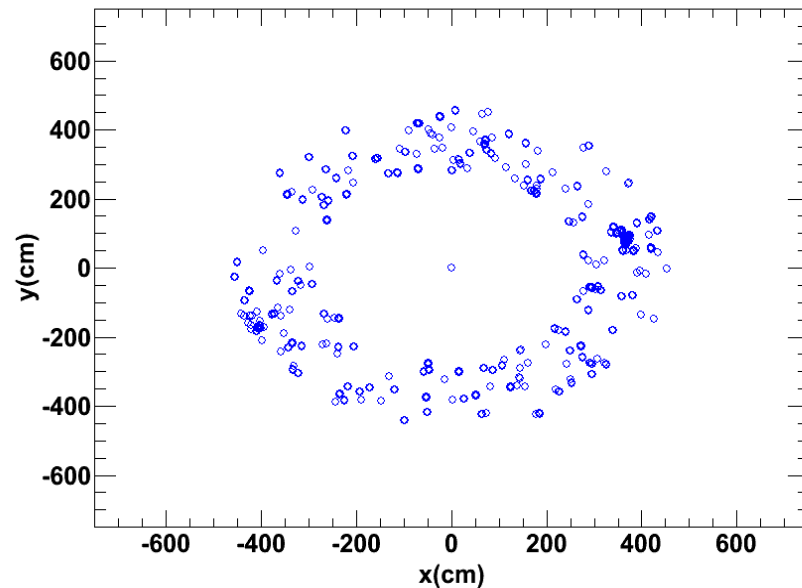


SIM information

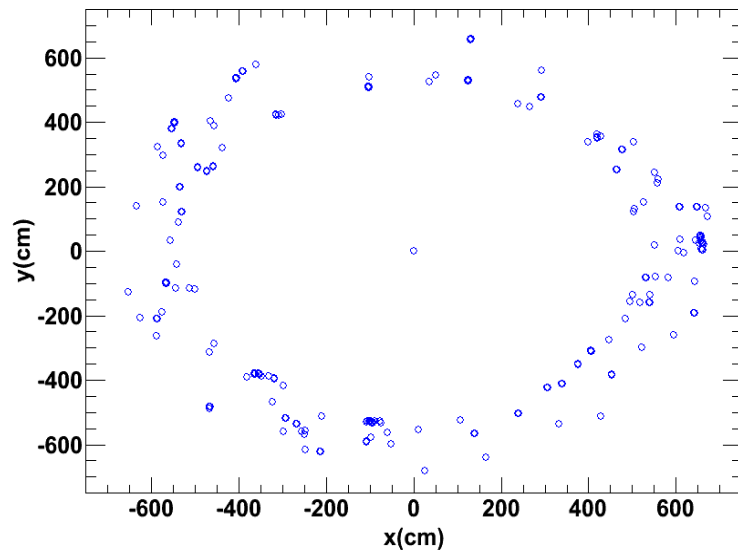
RE+11



RE+12

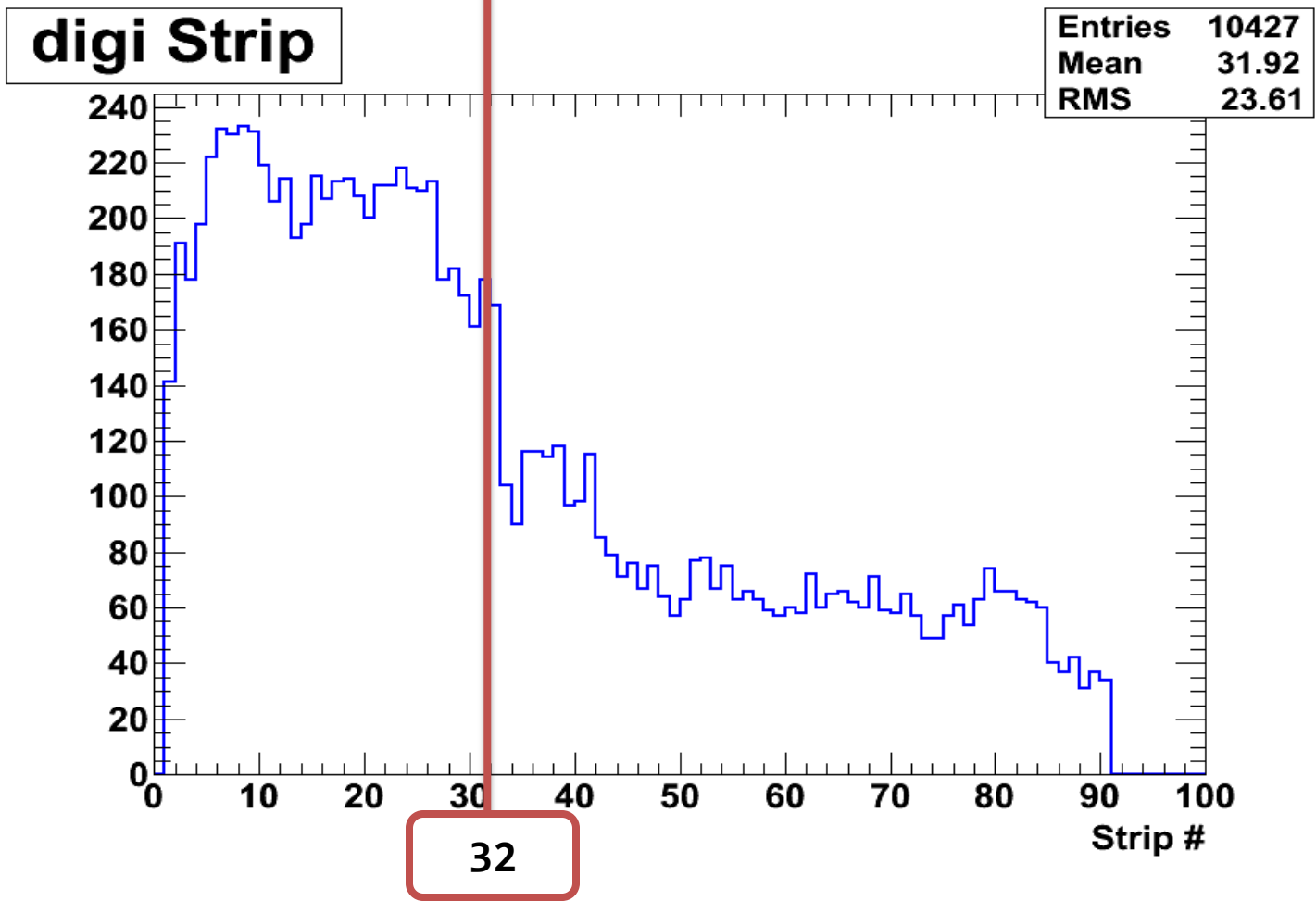


RE+13



Each station ruled out of 1st ring
(i.e. RE1/1, RE2/1, RE3/1)

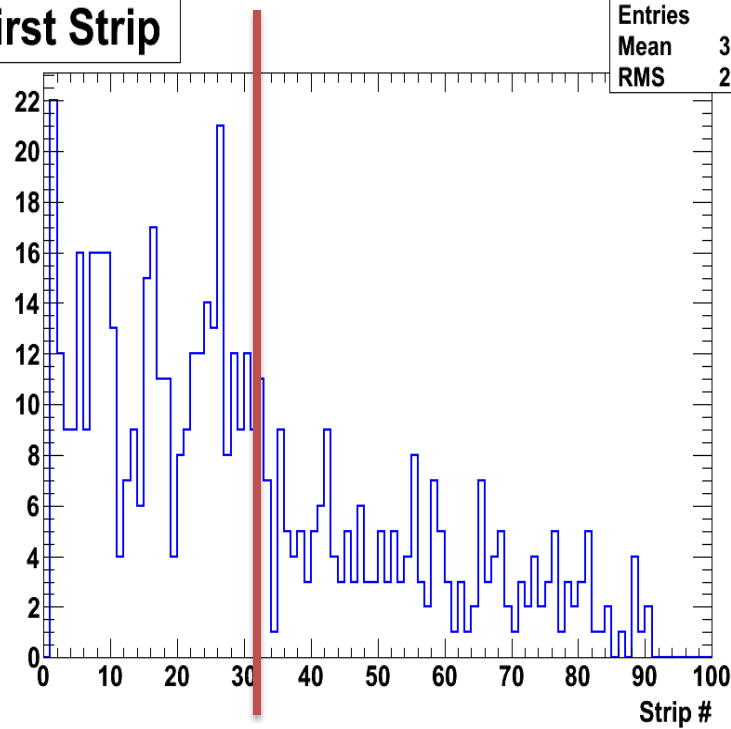
DIGI information



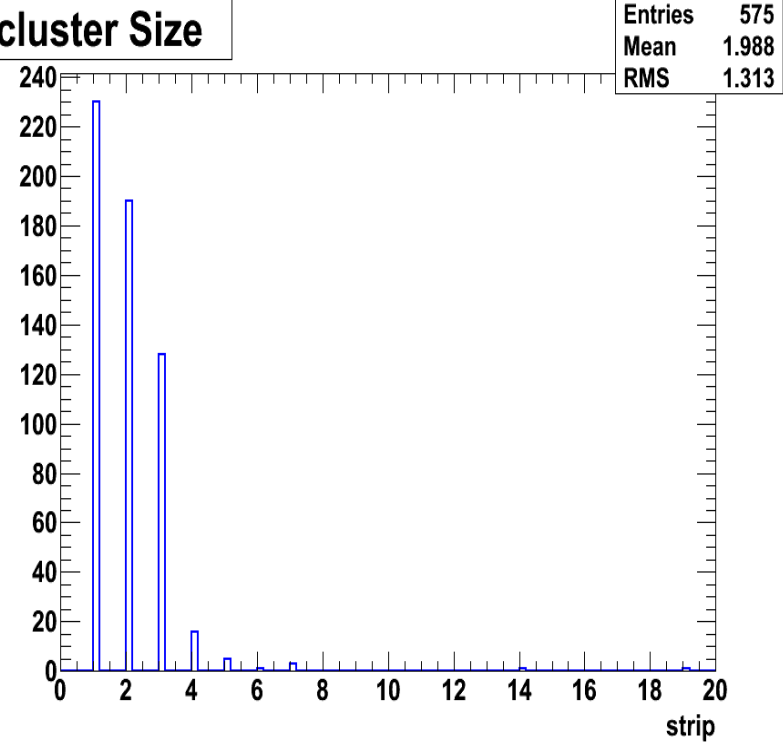
Endcap RPCs : 32strip X 3 roll (except RE1/1(X 4roll))

RECO information

First Strip



cluster Size



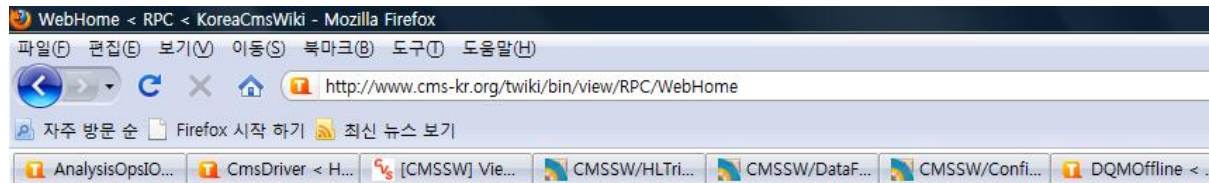
SingleMuPt100_cfi.py
Random Pt gun
 $P_T: 0.01 \sim 100.01$ GeV
 $|\eta| < 2.5$
of Events: 100

Cluster size: 1.98

RE1/1 project

- Write manual for prototype of RE1/1(component, preparation, assembly)

<http://www.cms-kr.org/twiki/bin/view/RPC/>



Document

- [component_list.xlsx](#): ComponentList?
- [RE11_preparation.pdf](#): PreparationList?
- [RE11_Assembly.pdf](#): AssemblyList?
- RE11_QC: QCList
- RE11_Installation: InstallationList?

RPC Web Utilities

- - [advanced search](#)
- [WebTopicList](#) - all topics in alphabetical order
- [WebChanges](#) - recent topic changes in this web

Future plan

- Study about pp & hydjet sample.
- Improve analyzer code.
- Complete manual for installation of RE1/1.

Back up

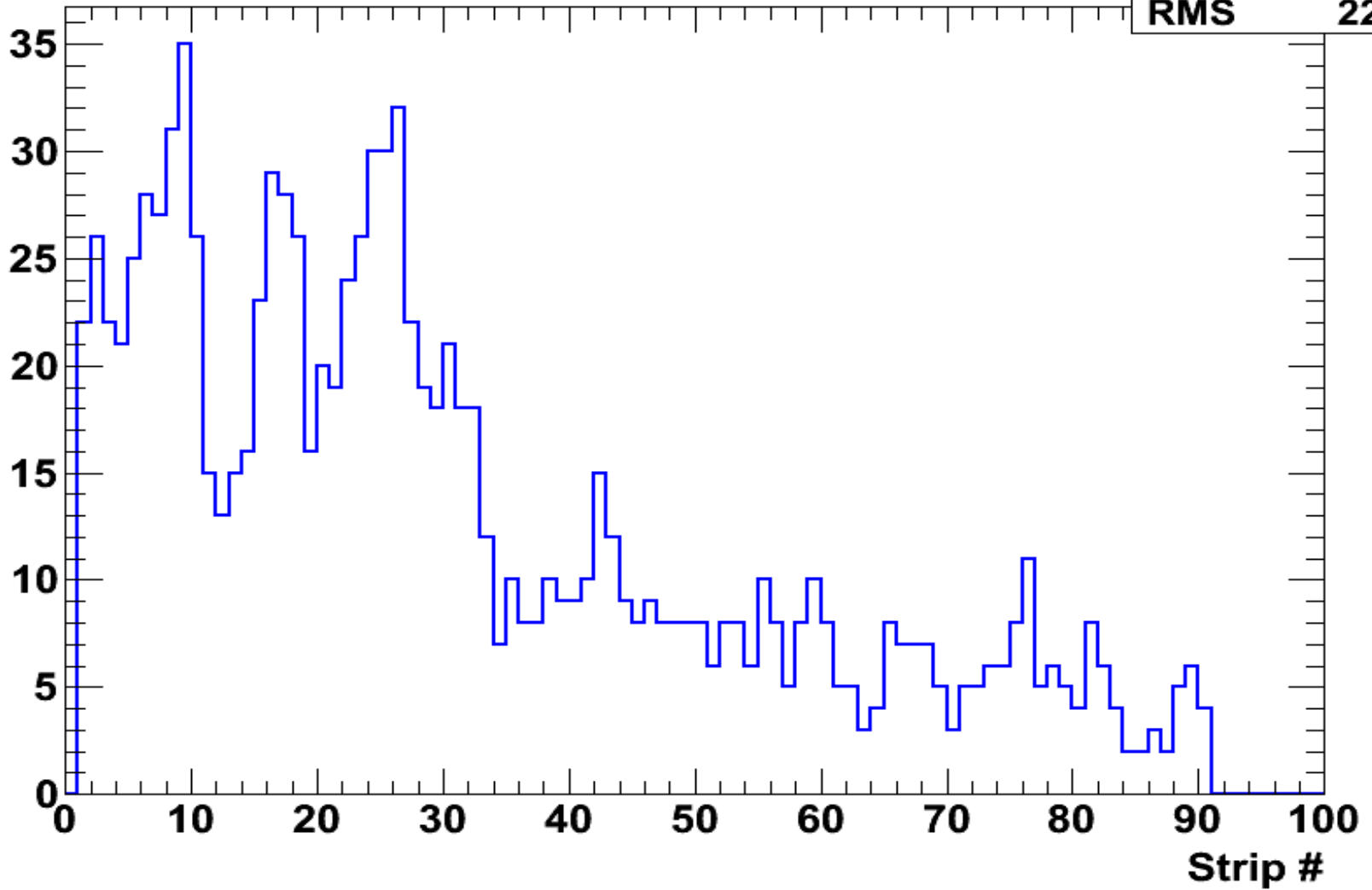
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digi Strip

Entries	1143
Mean	30.54
RMS	22.99



DIGI vs RECO Strip

