

```

[clas12@ifarm1402:~] cd /volatile/clas12/CollMeeting061017/
[clas12@ifarm1402:CollMeeting061017] ls -ltrh
total 228M
-rwxr----- 1 clas12 clas12-1 101 Oct 6 10:50 RunECal
-rw-r----- 1 clas12 clas12-1 3.9K Oct 6 10:50 ECal.java
-rw-r----- 1 clas12 clas12-1 227M Oct 6 10:50 simu.hipo
-rw-r----- 1 clas12 clas12-1 4.3K Oct 6 11:28 ECal.class
-rw-r----- 1 clas12 clas12-1 42K Oct 6 11:28 e_ecal.png
-rw-r----- 1 clas12 clas12-1 5.3K Oct 6 11:28 res_simu.hipo
drwxr-sr-x 3 clas12 clas12-1 4.0K Oct 6 14:25 demo_6oct17
[clas12@ifarm1402:CollMeeting061017] ls -ltrh demo_6oct17/
total 1.5G
-rwxr-xr-x 1 clas12 clas12-1 3.2K Sep 27 15:58 install-claracre-clas.sh
-rwxr-xr-x 1 clas12 clas12-1 896 Oct 6 14:08 run-tutorial.csh
-rw-r----- 1 clas12 clas12-1 624 Oct 6 14:08 instructions.txt
-rw-r----- 1 clas12 clas12-1 3.8M Oct 6 14:08 gen.dat
-rw-r----- 1 clas12 clas12-1 226 Oct 6 14:08 demo-env.csh
-rw-r----- 1 clas12 clas12-1 523K Oct 6 14:14 sim.evio
-rw-r----- 1 clas12 clas12-1 1.1G Oct 6 14:18 clas_000809.evio.902
drwxr-sr-x 8 clas12 clas12-1 4.0K Oct 6 14:19 myClara
-rw-r----- 1 clas12 clas12-1 147K Oct 6 14:19 sim.hipo
-rw-r----- 1 clas12 clas12-1 80M Oct 6 14:21 clas12_000809_a00902.hipo
-rw-r----- 1 clas12 clas12-1 35 Oct 6 14:22 files.list
-rw-r----- 1 clas12 clas12-1 424 Oct 6 14:24 cook.clara
-rw-r----- 1 clas12 clas12-1 484K Oct 6 14:25 out_sim.hipo
-rw-r----- 1 clas12 clas12-1 234M Oct 6 14:34 out_clas12_000809_a00902.hipo
[clas12@ifarm1402:CollMeeting061017]

```



```
[clas12@ifarm1402:demo_6oct17] more instructions.txt
```

- login into ifarm
- use tcsh (check with "echo \$SHELL", if not tcsh do "chsh -s /bin/tcsh")
- make sure both ~/.tcshrc and ~/.login are empty
- if any changes were made in previous two steps, log out and log back in
- select a location with sufficient disk space (e.g. /work or /volatile), copy the directory of ancillary files
- cd /volatile/clas12/username/
- cp -r /volatile/clas12/nathanh/demo_6oct17 .
- cd demo_6oct17
- source demo-env.csh
- make run-tutorial.csh executable and run it:
- chmod +x run-tutorial.csh
- ./run-tutorial.csh



```
[clas12@ifarm1402:demo_6oct17] more run-tutorial.csh
#!/bin/csh -f

source /group/clas12/gemc/environment.csh 4a.2.1
gemc /group/clas12/gemc/4a.2.1/clas12.gcard -INPUT_GEN_FILE="LUND, gen.dat" -OUTPUT="evio, sim.evio" -RUNNO=11

cp /cache/clas12/kpp/data/clas_000809.evio.902 .

wget --no-check-certificate https://claraweb.jlab.org/clara/_downloads/install-claracre-clas.sh
chmod +x install-claracre-clas.sh
setenv CLARA_HOME $PWD/myClara/
./install-claracre-clas.sh -v 4a.8.2
setenv COATJAVA $CLARA_HOME/plugins/clas12/

$COATJAVA/bin/evio2hipo -r 11 -t -1.0 -s 1.0 -o sim.hipo sim.evio
$COATJAVA/bin/decoder -t -0.5 -s 0.0 -i clas_000809.evio.902 -o clas12_000809_a00902.hipo -c 2

ls sim.hipo > files.list
ls clas12_000809_a00902.hipo >> files.list

sed -i "s|MY_WORKING_DIR|$PWD|g" cook.clara
sed -i "s|MY_NAME|'whoami'|g" cook.clara
sed -i "s|MY_FILE_LIST|$PWD/files.list|g" cook.clara
$CLARA_HOME/bin/clara-shell cook.clara
```



Elements of analysis code

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Oct 6th 2017



```
> $COATJAVA/bin/eviodump simu.hipo
```

```
***** EVENT # 12 *****
```

```
+-----+-----+-----+-----+-----+
| 40|                REC::Particle|          2|    331|    11|
| 41|                REC::Calorimeter|        3|    332|    25|
| 57|                ECAL::clusters|         3|   20723|    18|
+-----+-----+-----+-----+-----+
```

```
Choose (n=next,p=previous, q=quit), Type Bank Name or id : REC::Particle
```

```
+-----+
pid ( INT) :      11      22
px ( FLOAT) :    0.794  -0.342
py ( FLOAT) :    0.104   0.274
pz ( FLOAT) :    3.243   7.452
charge ( BYTE) :      -1      0
+-----+
```

```
Choose (n=next,p=previous, q=quit), Type Bank Name or id : REC::Calorimeter
```

```
+-----+
index ( SHORT) :      0      1      2
pindex ( SHORT) :      0      0      0
detector ( BYTE) :      7      7      7
sector ( BYTE) :      1      1      1
layer ( BYTE) :      1      4      7
energy ( FLOAT) :    0.450   0.341   0.047
x ( FLOAT) :    216.596  228.976  237.966
y ( FLOAT) :     64.439   66.246   67.411
z ( FLOAT) :    671.121  701.316  717.615
+-----+
```



```

public class ECal {
    public ECal() {
    }
    public int makeElectron(DataBank bank){
    }
    public void getElecEBEcal(DataBank bank){
    }
    public void processEvent(DataEvent event) {
    }
    public void analyze(){
    }
    public void plot() {
    }
    public void write() {
    }
    public static void main(String[] args) {
        ECal ana = new ECal();
        HipoDataSource reader = new HipoDataSource();
        reader.open("simu.hipo");
        int count = 0;
        while(reader.hasEvent()) {
            DataEvent event = reader.getNextEvent();
            ana.processEvent(event);
            count++;
            if(count%500 == 0) System.out.println(count);
        }
        reader.close();
        ana.analyze();
        ana.plot();
        ana.write();
    }
}

```



```

public class ECal {
    public int e_part_ind;
    public float e_rec_mom, e_ecal_X, e_ecal_Y, e_ecal_E;
    public H2F H_XY_ECal, H_ESampl_ECal;
    public GraphErrors g_m_ESampl_ECal, g_s_ESampl_ECal;

    public ECal() {
        H_XY_ECal = new H2F("H_XY_ECal", "H_XY_ECal", 100, -500, 500, 100, -500, 500);
        H_XY_ECal.setTitle("Electron ECAL POS");
        H_XY_ECal.setTitleX("X (cm)");
        H_XY_ECal.setTitleY("Y (cm)");
        H_ESampl_ECal = new H2F("H_ESampl_ECal", "H_ESampl_ECal", 100, 0, 9, 100, 0, 0.5);
        H_ESampl_ECal.setTitle("Electron ECAL Sampling Fraction");
        H_ESampl_ECal.setTitleX("p (GeV/c)");
        H_ESampl_ECal.setTitleY("Edep/p");
    }
    public static void main(String[] args) {
        ECal ana = new ECal();
    }
}

```

```

public int makeElectron(DataBank bank){
    for(int k = 0; k < bank.rows(); k++){
        int pid = bank.getInt("pid", k);
        if( pid == 11 ){
            float px = bank.getFloat("px", k);
            float py = bank.getFloat("py", k);
            float pz = bank.getFloat("pz", k);
            e_rec_mom = (float)Math.sqrt(px*px+py*py+pz*pz);
            return k;
        }
    }
    return -1;
}

public void getElecEBEcal(DataBank bank){
    e_ecal_E = 0;
    for(int k = 0; k < bank.rows(); k++){
        int det = bank.getInt("layer", k);
        short pind = bank.getShort("pindex",k);
        if(det==1 && pind==e_part_ind){
            e_ecal_X = bank.getFloat("x",k);
            e_ecal_Y = bank.getFloat("y",k);
            e_ecal_E += bank.getFloat("energy",k);
        }
        if(det==4 && pind==e_part_ind)e_ecal_E += bank.getFloat("energy",k);
        if(det==7 && pind==e_part_ind)e_ecal_E += bank.getFloat("energy",k);
    }
}

public void processEvent(DataEvent event) {
    if(event.hasBank("REC::Particle"))e_part_ind = makeElectron(event.getBank("REC::Particle"));
    if(e_part_ind==-1)return;
    if(event.hasBank("REC::Calorimeter"))getElecEBEcal(event.getBank("REC::Calorimeter"));
    else return;
    H_XY_ECal.fill(e_ecal_X,e_ecal_Y);
    H_ESampl_ECal.fill(e_rec_mom,e_ecal_E/e_rec_mom);
}

```




```

public void plot() {
    EmbeddedCanvas can_e_ecal = new EmbeddedCanvas();
    can_e_ecal.setSize(1200,600);
    can_e_ecal.divide(2,1);
    can_e_ecal.setAxisTitleSize(24);
    can_e_ecal.setAxisFontSize(24);
    can_e_ecal.setTitleSize(24);
    can_e_ecal.cd(0);can_e_ecal.draw(H_XY_ECal);
    can_e_ecal.cd(1);can_e_ecal.draw(H_ESampl_ECal);
    can_e_ecal.draw(g_m_ESampl_ECal,"same");
    can_e_ecal.draw(g_s_ESampl_ECal,"same");
    can_e_ecal.save("e_ecal.png");
}
public void write() {
    TDirectory dirout = new TDirectory();
    dirout.mkdir("/ecal/");
    dirout.cd("/ecal/");
    dirout.addDataSet(H_XY_ECal,H_ESampl_ECal);
    g_m_ESampl_ECal.setName("g_m_ESampl_ECal");
    g_s_ESampl_ECal.setName("g_s_ESampl_ECal");
    dirout.addDataSet(g_m_ESampl_ECal,g_s_ESampl_ECal);
    dirout.writeFile("res_simu.hipo");
}

```

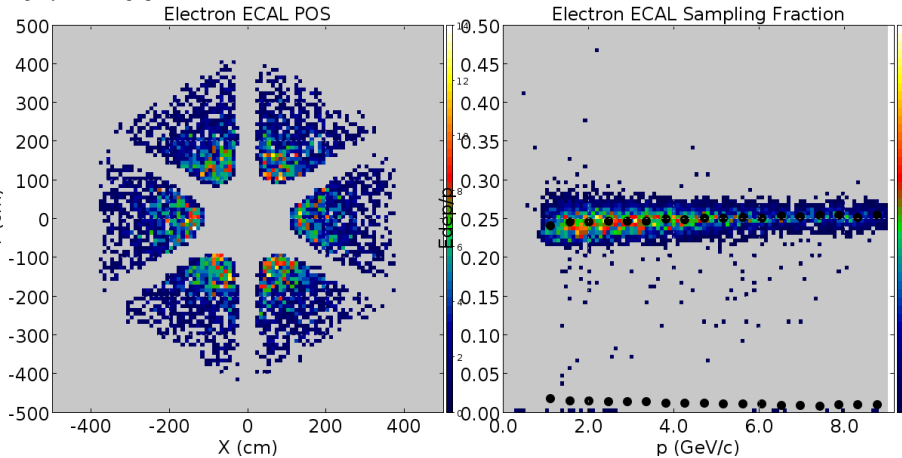


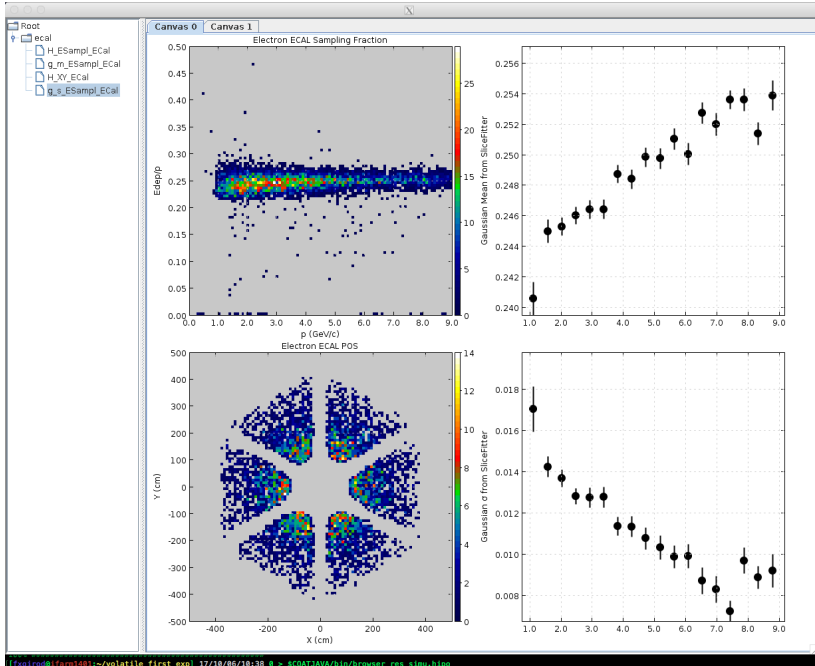
```
import org.jlab.groot.data.H2F;
import org.jlab.io.base.DataBank;
import org.jlab.io.base.DataEvent;
import org.jlab.io.hipo.HipoDataSource;
import org.jlab.groot.fitter.ParallelSliceFitter;
import org.jlab.groot.graphics.EmbeddedCanvas;
import org.jlab.groot.data.GraphErrors;
import org.jlab.groot.data.TDirectory;

public class ECal {
}
```



```
javac -cp "$COATJAVA/lib/clas/*" ECal.java
java -cp "$COATJAVA/lib/clas/*:" ECal
display e_ecal.png
```





[fxgirod@lfarm1481:~/volattle_first_exp] 17/10/06/10:38 @ > \$COAT3JAVA/bin/browser_res_simu.hipo



Conclusion

It's not ROOT but it works

