

SHOE Framework Update

(newgeom branch)

Renaming for MC Data

Renaming for Raw Data

Renaming for Global Reco GenFit

New Classes

Raw Reconstruction

MC Reconstruction

Renaming

Renaming for MC Data

• TAMCntuEve → TAMCntuPart file

- TAMCntuEve → TAMCntuPart class
- TAMCeveTrack → TAMCpart class

• TAMCactNtuEve → TAMCactNtuPart file

- TAMCactNtuEve → TAMCactNtuPart class

• TA*actNtuMC → TA*actNtuHitMC file

- Removed TA*actNtuMC, keeping TA*actNtuHitMC
- Removed TAMCactNtu*, except TAMCactNtuTrack
- Removed LocalRecoMC, renaming LocalRecoNtuMC to LocalRecoMC
- Removed Evento class
- Kept Txt2Root executable for backward compatibility

Renaming for Raw Data

- TA*ntuRaw \mapsto TA*ntuHit file
 - TA*ntuRaw \mapsto TA*ntuHit class
 - TA*ntuHit \mapsto TA*hit class
- TA*actNtuRaw \mapsto TA*actNtuHit file
 - To be coherent with MC actions
- TA*datRaw \mapsto TA*ntuRaw file
 - TA*datRaw \mapsto TA*ntuRaw class
 - TA*rawHit \mapsto TA*rawhit class, ok !
- TABMactDatRaw \mapsto TABMactNtuRaw file
 - only BM cos ST, TW and CA have WD reader class
 - VT & IT not needed
 - MSD not yet implemented

Renaming for Global Reco GenFit

• GlobalTrackRepostory \mapsto TAGntuGlbTrackK file

- GlobalTrackRepostory \mapsto TAGntuGlbTrackK class

• GlobalTrackKalman \mapsto TAGtrackK file

- GlobalTrackKalman \mapsto TAGtrackK class

➔ Thanks to Roberto Z. GenFit is in FOOT framework using action (TAGactKFitter)

• UpdatePDG class

- moved methods in TAMCparTools, using static methods instead of singleton
- removed UpdatePDG class
- corrected mixing isotopes of B with Be
 - ➔ B7, B9, B10 and Be10, Be11 (Boron only exists in 10 and 11 in frag.)
- corrected mixing btw atomic units and GeV/c^2

New classes

MC Event container (i)

- TAMCntuEvent class

```
class TAMCntuEvent : public TAGdata {
public:
    TAMCntuEvent();
    virtual      ~TAMCntuEvent();

    Int_t        GetEventNumber()      const { return fEventNumber;  }
    void         SetEventNumber(Int_t nb) { fEventNumber = nb;      }

    Int_t        GetTriggerNumber()    const { return fTriggerNumber; }
    void         SetTriggerNumber(Int_t nb) { fTriggerNumber = nb;  }

    ULong64_t    GetTimeStamp()        const { return fTimeStamp;    }
    void         SetTimeStamp(ULong64_t nb) { fTimeStamp = nb;      }

    virtual void Clear(Option_t* opt="");
    virtual void ToStream(ostream& os=cout, Option_t* option="") const;

public:
    static const Char_t* GetBranchName() { return fgkBranchName.Data(); }

private:
    Int_t        fEventNumber;
    Int_t        fTriggerNumber;
    ULong64_t    fTimeStamp;

    . . .
    ClassDef(TAMCntuEvent,2)
};
```

➔ Add TAMCactNtuEvent action

➔ Could add/remove members ?

MC Event container (ii)

- Simulation

```
TAMCntuEvent* TAMCflukaParser::GetEvents(EVENT_STRUCT* evStr, TAGdataDsc* p_ntuevt)
{
    TAMCntuEvent* p_nturaw = (TAMCntuEvent*) p_ntuevt->Object();
    p_nturaw->Clear();

    p_nturaw->SetEventNumber(evStr->EventNumber);

    return p_nturaw;
}
```

```
/*-----*/
void TAMCevent::AddEvent(Int_t nb)
{
    fEvent->SetEventNumber(nb);
}
```

Only filled for MC, need also for raw data

➔ Need dedicated action TAGactNtuEvent and container TAGntuEvent

Event container

- TAGntuEvent class

```
class TAGntuEvent : public TAGdata {
public:
  . . .
private:
  UInt_t      fTimeSec;
  UInt_t      fTimeUsec;
  UInt_t      fEventNumber;
  UInt_t      fLiveTime;
  UInt_t      fTimeSinceLastTrigger;
  UInt_t      fClockCounter;
  UInt_t      fTriggerCounter;
  UInt_t      fBCOofTrigger;
  UInt_t      fSpillNrAndTrgFineDelay;
  UInt_t      fPMTsAndBusy;

private:
  static TString   fgkBranchName;

  ClassDef(TAGntuEvent,1)
};
```

- ➔ Copy of the TrgEvent class of DAQ with a dedicated TAGactNtuEvent action
- ➔ Added in LocalReco class
- ➔ Including method of TAGtimeStamp and remove this class
(Remove also unused TAGpadGroup)

Region flag (i)

- FootGlobal.par file

```
##### Options for reconstruction #####  
  
EnableTree:          y  
EnableHisto:         y  
EnableTracking:      y  
  
EnableSaveHits:     n  
EnableRootObject:   n  
EnableTWZmc:        n  
EnableTWnoPU:       n  
EnableTWZmatch:     y  
EnableTWCalBar:     n  
EnableRegionMc:   n
```

- ➔ Propagate to GlobalPar and TAMCevent classes
- ➔ Modify all FootGlobal.par files
- ➔ Thanks to Yun who's modified the TAGrunInfo and Txt2NtuRoot (more in his talk)
- ➔ Modified also Txt2Root, interfaced with Fluka parser class

Region flag (ii)

- TAGcampaignManager

```
class TAGcampaign : public TAGparTools {
public:
    TAGcampaign();
    virtual ~TAGcampaign();

    . . .

    const Char_t*      GetMapFile(const TString& detName, Int_t runNumber, Int_t item = 0);
    const Char_t*      GetRegFile(const TString& detName, Int_t runNumber);
    const Char_t*      GetCalFile(const TString& detName, Int_t runNumber, Bool_t isTofCalib = false,
                                Bool_t isTofBarCalib = false, Bool_t elossTuning = false);
    . . .

    // mapping file
    map<TString, vector<TString> > fFileMap;
    map<TString, vector<TArrayI> > fRunsMap;

    // region file
    map<TString, TString> fFileRegMap;
    map<TString, TArrayI> fRunsRegMap;
    . . .
}
```

- ➔ Region files in geomaps/exp/FOOT.reg
- ➔ Thanks to Giuseppe, who's provided the files
- ➔ Add TAMCactNtuRegion for reading back Fluka structure tree

Magnetic Field

- TADIdetector.geo

```
// -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
// -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
//
// Geometry file for FOOT magnets
//
// -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
// Parameters of the magnets
// Types 0 const, 1 function, 2 map file
// -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Magnets:      2
Type:         0
MagValueX:    5000.0   MagValueY:   15000.0   MagValueZ:    2000.0
```

- When setting type to 0
 - ➔ Constant field with a given value in Gauss
 - ➔ Propagate in TADlgeoField and TADlparGeo classes
 - ➔ Could be useful for global reconstruction where magnetic is on but set to zero

Reconstruction

Raw Reconstruction (i)

- L0 reconstruction (i)

```
DecodeRaw -in data/data_built.2239.physics_foot.daq.VTX.1.dat -out run2239_Out.root -nev 10000 -exp GSI -run 2239
```

```
===== Input Parameters =====  
Global debug level: 0  
Detectors included:  
- Start Counter - Beam Monitor - Target - Vertex - ToF Wall -  
  
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created  
  
In file ./geomaps/GSI/TAGdetector.geo the following beam parameters for a 16C beam have been set:  
BeamEnergy:      0.400 GeV/u  
BeamAtomicMass:  16  
BeamAtomicNumber: 8  
BeamMaterial:    "O"  
  
TargetMaterial:  "C"  
TargetThickness: 0.500 cm  
  
Info in <TAGbaseWDparTime::FromFile()>: Loading ST WD time calibration from file:./calib/GSI/WDTimeCalibration/tcalib_2239.dat  
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/GSI/TABM_T0_Calibration_2239.cal  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/GSI/TATW_Energy_Calibration.cal for calibration  
Info in <LocalReco::ReadParFiles()>: Eloss tuning for GSI data status:: ON  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/GSI/TATW_Tof_Calibration_2239.cal for calibration  
Info in <TATWparCal::FromFileZID()>: Open file ./config/GSI/TATW_BBparameters_160_400.cfg for Bethe-Bloch parametrization  
  
Info in <LocalReco::CampaignChecks()>: Reading raw data  
Opening file data/data_built.2239.physics_foot.daq.VTX.1.dat
```

```
IncludeDI:      n  
IncludeST:      y  
IncludeBM:      y  
IncludeTG:      y  
IncludeVT:      y  
IncludeIT:      n  
IncludeMSD:     n  
IncludeTW:      y  
IncludeCA:      n
```

Raw Reconstruction (ii)

- L0 reconstruction (ii)

```
-----HEADER OF FILE-----  
Info Header WRITER=: EB-RCD  
Info Header FILENAME=: data_test.00002239.physics_foot.daq.RAW._lb0000._EB-RCD  
Info Header number of file=: 1  
Info Header GUID: GUID=2E011509-225A-E911-BFEA-3CFDFED01448  
Info Header stream: Stream=physics_foot  
Info Header project: Project=data_test  
Info Header lumi: LumiBlock=0  
-----END OF HEADER FILE-----
```

```
TAGroot:  
Known Actions:  
name                type  
actGeoTrafo         TAGgeoTrafo  
actCamMan           TAGcampaignManager  
locRecFile          TAGactTreeWriter  
daqActReader        TAGactDaqReader  
evtActNtu           TAGactNtuEvent  
wdActRaw            TAGactWDreader  
stActNtu            TASTactNtuHit  
bmActDat            TABMactNtuRaw  
bmActNtu            TABMactNtuHit  
vtActNtu            TAVTactNtuHit  
twActNtu            TATWactNtuHit  
bmActTrack          TABMactNtuTrack  
vtActClus           TAVTactNtuClusterF  
vtActTrack          TAVTactNtuTrackF  
vtActVtx            TAVTactNtuVertexPD  
twActPoint          TATWactNtuPoint
```

```
Known DataDsc's:  
name                type                produced by  
daqEvt              TAGdaqEvent  
evtNtu              TAGntuEvent         evtActNtu  
stDat               TASTntuRaw          wdActRaw  
twdDat              TATWntuRaw          wdActRaw  
caDat               TACAntuRaw          wdActRaw  
stNtu               TASTntuHit          stActNtu  
bmDat               TABMntuRaw          bmActDat  
bmNtu               TABMntuHit          bmActNtu  
vtRaw              TAVTntuHit          vtActNtu  
twRaw              TATWntuHit          twActNtu  
bmTrack             TABMntuTrack        bmActTrack  
vtTrack             TAVTntuTrack        vtActTrack  
vtVtx              TAVTntuVertex       vtActVtx  
vtClus             TAVTntuCluster      vtActClus  
twPoint            TATWntuPoint        twActPoint
```

MC production (i)

• Producing, from Fluka, MC shoe data/Fluka structure

```
Txt2[Ntu]Root -in 12C_C_200_dat.txt -out 12C_C_200shoe[reg].root -exp 12C_200 -run 1 -nev 1000 [-reg]
```

```
===== Input Parameters =====  
Global debug level: 0  
Detectors included:  
- Dipole - Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF  
Wall - Calorimeter -  
  
Now processing data from 12C_C_200_dat.txt file!  
[Open region file ./geomaps/12C_200/F00T.reg]  
total number of event safely converted= 1373
```


MC production (ii)

→ Producing, with Geant4, MC shoe data

```
TAGsimulation -out 12C_C_200shoe.root -exp 12C_200 -run 1 -nev 1000
```

```
*****
Geant4 version Name: geant4-10-05-patch-01 [MT] (17-April-2019)
      Copyright : Geant4 Collaboration
      References : NIM A 506 (2003), 250-303
                  : IEEE-TNS 53 (2006), 270-278
                  : NIM A 835 (2016), 186-225
                  WWW : http://geant4.org/
*****

Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created
Info in <TCGbaseGeometryConstructor::TCGbaseGeometryConstructor(>: Creating geometry for experiment 12C_200 with run number 1

<<< Geant4 Physics List simulation engine: QGSP_BIC

Construct Run Action
Info in <TCGtargetConstructor::BuildCubicTarget(>: Build cubic target
Info in <TCSTgeometryConstructor::Construct(>: Construct Start Counter
Info in <TCSTgeometryConstructor::DefineSensitive(>: Define sensitive for Start Counter
Info in <TCBMgeometryConstructor::Construct(>: Construct Beam Monitor
Info in <TCBMgeometryConstructor::DefineSensitive(>: Define sensitive for Beam Monitor
Info in <TCVTgeometryConstructor::Construct(>: Construct Vertex
Info in <TCVTgeometryConstructor::DefineSensitive(>: Define sensitive for Vertex
Info in <TCMgeometryConstructor::Construct(>: Construct Magnets
Info in <TCITgeometryConstructor::Construct(>: Construct Inner Tracker
Info in <TCITgeometryConstructor::DefineSensitive(>: Define sensitive for Inner Tracker
Info in <TCMSDgeometryConstructor::Construct(>: Construct Multi Strip Detector
Info in <TCMSDgeometryConstructor::DefineSensitive(>: Define sensitive for Multi Strip Detector
Info in <TCTWgeometryConstructor::Construct(>: Construct ToF Wall
Info in <TCTWgeometryConstructor::DefineSensitive(>: Define sensitive for ToF Wall
Info in <TCCAgeometryConstructor::Construct(>: Construct Calorimeter
Info in <TCCAgeometryConstructor::DefineSensitive(>: Define sensitive for Calorimeter
Info in <TADIGeoField::TADIGeoField(>: Going to open ./data/AsymmetricDipoles.table
G4ClassicalRK4 (default) is called
Info in <TCMfieldSetup::CreateStepperAndChordFinder(>: The minimal step is equal to 1.000000 mm
```

MC Reconstruction (i)

- L0 reconstruction from shoe format (i)

```
DecodeMC -in 12C_C_200shoe.root -out 12C_C_200_Out.root -exp 12C_200 -run 1 -nev 10000
```

```
===== Input Parameters =====  
Global debug level: 0  
Detectors included:  
- Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -  
  
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created  
  
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:  
BeamEnergy:      0.200 GeV/u  
BeamAtomicMass:  12  
BeamAtomicNumber: 6  
BeamMaterial:    "C"  
  
TargetMaterial:  "C"  
TargetThickness: 0.500 cm  
  
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal  
Info in <TATWparCal::FromCalibFile(>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration  
Info in <TATWparCal::FromCalibFile(>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration  
Info in <TATWparCal::FromFileZID(>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization  
Info in <LocalRecoMC::CampaignChecks(>: Reading MC data  
Info in <LocalRecoMC::GlobalChecks(>: Reading MC root file with shoe format
```

EnableTree:	y
EnableHisto:	y
EnableTracking:	y
EnableSaveHits:	n
EnableRootObject:	y
EnableTWZmc:	n
EnableTWnoPU:	n
EnableTWZmatch:	y
EnableTWCalBar:	n
EnableRegionMc:	n

MC Reconstruction (ii)

- L0 reconstruction from shoe format (ii)

TAGroot:

Known Actions:

name	type
actGeoTrafo	TAGgeoTrafo
actCamMan	TAGcampaignManager
locRecFile	TAGactTreeWriter
actEvtReader	TAGactTreeReader
stActNtu	TASTactNtuHitMC
bmActNtu	TABMactNtuHitMC
vtActNtu	TAVTactNtuHitMC
itActNtu	TAITactNtuHitMC
msdActNtu	TAMSDactNtuHitMC
twActNtu	TATWactNtuHitMC
caActNtu	TACAactNtuHitMC
bmActTrack	TABMactNtuTrack
vtActClus	TAVTactNtuClusterF
vtActTrack	TAVTactNtuTrackF
vtActVtx	TAVTactNtuVertexPD
itActClus	TAITactNtuClusterF
msdActClus	TAMSDactNtuCluster
twActPoint	TATWactNtuPoint
caActClus	TACAactNtuCluster

Known ParaDsc's:

name	type
tgGeo	TAGparGeo

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Known DataDsc's:

name	type	produced by
eveMc	TAMCntuTrack	actEvtReader
evtMc	TAMCntuEvent	actEvtReader
stMc	TAMCntuHit	actEvtReader
stRaw	TASTntuHit	stActNtu
bmMc	TAMCntuHit	actEvtReader
bmRaw	TABMntuHit	bmActNtu
vtMc	TAMCntuHit	actEvtReader
vtRaw	TAVTntuHit	vtActNtu
itMc	TAMCntuHit	actEvtReader
itRaw	TAITntuHit	itActNtu
msdMc	TAMCntuHit	actEvtReader
msdRaw	TAMSDntuHit	msdActNtu
twMc	TAMCntuHit	actEvtReader
twRaw	TATWntuHit	twActNtu
caMc	TAMCntuHit	actEvtReader
caRaw	TACAntuHit	caActNtu
bmTrack	TABMntuTrack	bmActTrack
vtTrack	TAVTntuTrack	vtActTrack
vtVtx	TAVTntuVertex	vtActVtx
vtClus	TAVTntuCluster	vtActClus
itClus	TAITntuCluster	itActClus
msdClus	TAMSDntuCluster	msdActClus
twPoint	TATWntuPoint	twActPoint
caClus	TACAntuCluster	caActClus

Required Actions:

actEvtReader	TAGactTreeReader
--------------	------------------

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MC Reconstruction (iii)

- L0 reconstruction from shoe format with region (i)

```
DecodeMC -in 12C_C_200shoereg.root -out 12C_C_200_Out.root -exp 12C_200 -run 1 -nev 10000
```

EnableTree:	y
EnableHisto:	y
EnableTracking:	y
EnableSaveHits:	n
EnableRootObject:	y
EnableTWZmc:	n
EnableTWnoPU:	n
EnableTWZmatch:	y
EnableTWCalBar:	n
EnableRegionMc:	y

```
===== Input Parameters =====  
Global debug level: 0  
Detectors included:  
- Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -  
  
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created  
  
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:  
BeamEnergy:      0.200 GeV/u  
BeamAtomicMass:  12  
BeamAtomicNumber: 6  
BeamMaterial:    "C"  
  
TargetMaterial:  "C"  
TargetThickness: 0.500 cm  
  
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration  
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization  
  
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data  
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root file with shoe format  
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root tree with region crossing informations
```

MC Reconstruction (iv)

- L0 reconstruction from shoe format with region (ii)

```

TAGroot:
Known Actions:
  name          type
  actGeoTrafo   TAGgeoTrafo
  actCamMan     TAGcampaignManager
  locRecFile    TAGactTreeWriter
  actEvtReader  TAGactTreeReader
  stActNtu      TASTactNtuHitMC
  bmActNtu      TABMactNtuHitMC
  vtActNtu      TAVTactNtuHitMC
  itActNtu      TAITactNtuHitMC
  msdActNtu     TAMSdactNtuHitMC
  twActNtu      TATWactNtuHitMC
  caActNtu      TACAactNtuHitMC
  bmActTrack    TABMactNtuTrack
  vtActClus     TAVTactNtuClusterF
  vtActTrack    TAVTactNtuTrackF
  vtActVtx      TAVTactNtuVertexPD
  itActClus     TAITactNtuClusterF
  msdActClus    TAMSdactNtuCluster
  twActPoint    TATWactNtuPoint
  caActClus     TACAactNtuCluster
  caActClus     TACAactNtuCluster
Known ParaDsc's:
  name          type
  tgGeo         TAGparGeo
  . . .

```

```

Known DataDsc's:
  name          type          produced by
  regMc         TAMCntuRegion  actEvtReader
  evtMc         TAMCntuEvent   actEvtReader
  eveMc         TAMCntuTrack   actEvtReader
  stMc          TAMCntuHit     actEvtReader
  stRaw         TASTntuHit     stActNtu
  bmMc          TAMCntuHit     actEvtReader
  bmRaw         TABMntuHit     bmActNtu
  vtMc          TAMCntuHit     actEvtReader
  vtRaw         TAVTntuHit     vtActNtu
  itMc          TAMCntuHit     actEvtReader
  itRaw         TAITntuHit     itActNtu
  msdMc         TAMCntuHit     actEvtReader
  msdRaw        TAMSdntuHit    msdActNtu
  twMc          TAMCntuHit     actEvtReader
  twRaw         TATWntuHit     twActNtu
  caMc          TAMCntuHit     actEvtReader
  caRaw         TACAntuHit     caActNtu
  bmTrack       TABMntuTrack    bmActTrack
  vtTrack       TAVTntuTrack    vtActTrack
  vtVtx         TAVTntuVertex  vtActVtx
  vtClus        TAVTntuCluster vtActClus
  itClus        TAITntuCluster  itActClus
  msdClus       TAMSdntuCluster msdActClus
  twPoint       TATWntuPoint   twActPoint
  caClus        TACAntuCluster
caActClusRequired Actions:
  actEvtReader  TAGactTreeReader
  . . .

```

MC Reconstruction (v)

- L0 reconstruction from Fluka structure (i)

```
DecodeMC -in 12C_C_200shoe.root -out 12C_C_200_Out.root -exp 12C_200 -run 1 -nev 10000
```

EnableTree:	y
EnableHisto:	y
EnableTracking:	y
EnableSaveHits:	n
EnableRootObject:	n
EnableTWZmc:	n
EnableTWnoPU:	n
EnableTWZmatch:	y
EnableTWCalBar:	n
EnableRegionMc:	n

```
===== Input Parameters =====  
  
Global debug level: 0  
Detectors included:  
- Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -  
  
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created  
  
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:  
BeamEnergy:      0.200 GeV/u  
BeamAtomicMass:  12  
BeamAtomicNumber: 6  
BeamMaterial:    "C"  
  
TargetMaterial:  "C"  
TargetThickness: 0.500 cm  
  
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration  
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization  
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data  
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root file with Fluka structure format
```

MC Reconstruction (vi)

- L0 reconstruction from Fluka structure (ii)

TAGroot:

Known Actions:

name	type
actGeoTrafo	TAGgeoTrafo
actCamMan	TAGcampaignManager
locRecFile	TAGactTreeWriter
actEvtReader	TAGactTreeReader
evtActNtuMc	TAMCactNtuEvent
eveActNtuMc	TAMCactNtuTrack
stActNtu	TASTactNtuHitMC
bmActNtu	TABMactNtuHitMC
vtActNtu	TAVTactNtuHitMC
itActNtu	TAITactNtuHitMC
msdActNtu	TAMSDactNtuHitMC
twActNtu	TATWactNtuHitMC
caActNtu	TACAactNtuHitMC
bmActTrack	TABMactNtuTrack
vtActClus	TAVTactNtuClusterF
vtActTrack	TAVTactNtuTrackF
vtActVtx	TAVTactNtuVertexPD
itActClus	TAITactNtuClusterF
msdActClus	TAMSDactNtuCluster
twActPoint	TATWactNtuPoint
caActClus	TACAactNtuCluster

Known ParaDsc's:

name	type
------	------

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Known DataDsc's:

name	type	produced by
evtMc	TAMCntuEvent	evtActNtuMc
eveMc	TAMCntuTrack	eveActNtuMc
stMc	TAMCntuHit	
stRaw	TASTntuHit	stActNtu
bmMc	TAMCntuHit	
bmRaw	TABMntuHit	bmActNtu
vtMc	TAMCntuHit	
vtRaw	TAVTntuHit	vtActNtu
itMc	TAMCntuHit	
itRaw	TAITntuHit	itActNtu
msdMc	TAMCntuHit	
msdRaw	TAMSDntuHit	msdActNtu
twMc	TAMCntuHit	
twRaw	TATWntuHit	twActNtu
caMc	TAMCntuHit	
caRaw	TACAntuHit	caActNtu
bmTrack	TABMntuTrack	bmActTrack
vtTrack	TAVTntuTrack	vtActTrack
vtVtx	TAVTntuVertex	vtActVtx
vtClus	TAVTntuCluster	vtActClus
itClus	TAITntuCluster	itActClus
msdClus	TAMSDntuCluster	msdActClus
twPoint	TATWntuPoint	twActPoint
caClus	TACAntuCluster	caActClus

Required Actions:

actEvtReader	TAGactTreeReader
--------------	------------------

• • •

MC Reconstruction (vii)

- L0 reconstruction from Fluka structure with regions (i)

```
DecodeMC -in 12C_C_200flk.root -out 12C_C_200_Out.root -exp 12C_200 -run 1 -nev 10000
```

```
===== Input Parameters =====
```

```
Global debug level: 0
```

```
Detectors included:
```

```
- Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -
```

```
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created
```

```
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:
```

```
BeamEnergy:      0.200 GeV/u
```

```
BeamAtomicMass:  12
```

```
BeamAtomicNumber: 6
```

```
BeamMaterial:    "C"
```

```
TargetMaterial:  "C"
```

```
TargetThickness: 0.500 cm
```

```
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal
```

```
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration
```

```
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration
```

```
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization
```

```
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data
```

```
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root file with Fluka structure format
```

```
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root tree with region crossing informations
```

```
EnableTree:      y  
EnableHisto:     y  
EnableTracking:  y
```

```
EnableSaveHits:  n  
EnableRootObject: n  
EnableTWZmc:     n  
EnableTWnoPU:    n  
EnableTWZmatch:  y  
EnableTWCalBar:  n  
EnableRegionMc:  y
```


MC Reconstruction (viii)

- L0 reconstruction from Fluka structure with regions (ii)

```

TAGroot:
Known Actions:
  name                type
  actGeoTrafo         TAGgeoTrafo
  actCamMan           TAGcampaignManager
  locRecFile          TAGactTreeWriter
  actEvtReader         TAGactTreeReader
  regActNtuMc         TAMCactNtuRegion
  evtActNtuMc         TAMCactNtuEvent
  eveActNtuMc         TAMCactNtuTrack
  stActNtu            TASTactNtuHitMC
  bmActNtu            TABMactNtuHitMC
  vtActNtu            TAVTactNtuHitMC
  itActNtu            TAITactNtuHitMC
  msdActNtu           TAMSdactNtuHitMC
  twActNtu            TATWactNtuHitMC
  caActNtu            TACAactNtuHitMC
  bmActTrack          TABMactNtuTrack
  vtActClus           TAVTactNtuClusterF
  vtActTrack          TAVTactNtuTrackF
  vtActVtx            TAVTactNtuVertexPD
  itActClus           TAITactNtuClusterF
  msdActClus          TAMSdactNtuCluster
  twActPoint          TATWactNtuPoint
  caActClus           TACAactNtuCluster
caActClus            TACAactNtuCluster
Known ParaDsc's:
  name                type
  . . .

```

```

Known DataDsc's:
  name                type                produced by
  regMc              TAMCntuRegion         regActNtuMc
  evtMc               TAMCntuEvent          evtActNtuMc
  eveMc               TAMCntuTrack          eveActNtuMc
  stMc                TAMCntuHit
  stRaw               TASTntuHit            stActNtu
  bmMc                TAMCntuHit            bmActNtu
  bmRaw               TABMntuHit            bmActNtu
  vtMc                TAMCntuHit            vtActNtu
  vtRaw               TAVTntuHit            vtActNtu
  itMc                TAMCntuHit            itActNtu
  itRaw               TAITntuHit            itActNtu
  msdMc               TAMCntuHit            msdActNtu
  msdRaw              TAMSdntuHit          msdActNtu
  twMc                TAMCntuHit            twActNtu
  twRaw               TATWntuHit            twActNtu
  caMc                TAMCntuHit            caActNtu
  caRaw               TACAntuHit            caActNtu
  bmTrack             TABMntuTrack          bmActTrack
  vtTrack             TAVTntuTrack          vtActTrack
  vtVtx              TAVTntuVertex         vtActVtx
  vtClus              TAVTntuCluster        vtActClus
  itClus              TAITntuCluster        itActClus
  msdClus             TAMSdntuCluster       msdActClus
  twPoint             TATWntuPoint          twActPoint
  caClus              TACAntuCluster        caActClus
caActClusRequired Actions:
  actEvtReader        TAGactTreeReader
  . . .

```

MC Reconstruction (ix)

IncludeKalman:	n
IncludeTOE:	y
EnableLocalReco:	n

- Global TOE reconstruction (i)

```
DecodeGlbToe -in 12C_C_200shoe.root -out 12C_C_200_GlbOut.root -exp 12C_200 -run 1 -nev 1000 -mc
```

```
===== Input Parameters =====
Global debug level: 0
Detectors included:
- Dipole - Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:
BeamEnergy:      0.200 GeV/u
BeamAtomicMass:  12
BeamAtomicNumber: 6
BeamMaterial:    "C"
TargetMaterial:  "C"
TargetThickness: 0.500 cm
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data
Info in <LocalRecoMC::GlobalChecks()>: Make global reconstruction with TOE
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root file with shoe format
```

MC Reconstruction (x)

- Global TOE reconstruction (ii)

```

TAGroot:
Known Actions:
  name          type
  actGeoTrafo   TAGgeoTrafo
  actCamMan     TAGcampaignManager
  locRecFile    TAGactTreeWriter
  actEvtReader  TAGactTreeReader
  stActNtu      TASTactNtuHitMC
  bmActNtu      TABMactNtuHitMC
  vtActNtu      TAVTactNtuHitMC
  itActNtu      TAITactNtuHitMC
  msdActNtu     TAMSdactNtuHitMC
  twActNtu      TATWactNtuHitMC
  caActNtu      TACAactNtuHitMC
  bmActTrack    TABMactNtuTrack
  vtActClus     TAVTactNtuClusterF
  vtActTrack    TAVTactNtuTrackF
  vtActVtx      TAVTactNtuVertexPD
  itActClus     TAITactNtuClusterF
  msdActClus    TAMSdactNtuCluster
  twActPoint    TATWactNtuPoint
  caActClus     TACAactNtuCluster
  glbActTrack  TAGactNtuGlbTrack
Known ParaDsc's:
  name          type
  tgGeo         TAGparGeo
  . . .

```

```

Known DataDsc's:
  name          type          produced by
  eveMc         TAMCntuTrack  actEvtReader
  stMc          TAMCntuHit    actEvtReader
  stRaw         TASTntuHit    stActNtu
  bmMc          TAMCntuHit    actEvtReader
  bmRaw         TABMntuHit    bmActNtu
  vtMc          TAMCntuHit    actEvtReader
  vtRaw         TAVTntuHit    vtActNtu
  itMc          TAMCntuHit    actEvtReader
  itRaw         TAITntuHit    itActNtu
  msdMc         TAMCntuHit    actEvtReader
  msdRaw        TAMSdntuHit   msdActNtu
  twMc          TAMCntuHit    actEvtReader
  twRaw         TATWntuHit    twActNtu
  caMc          TAMCntuHit    actEvtReader
  caRaw         TACAntuHit    caActNtu
  bmTrack       TABMntuTrack  bmActTrack
  vtTrack       TAVTntuTrack  vtActTrack
  vtVtx         TAVTntuVertex vtActVtx
  vtClus        TAVTntuCluster vtActClus
  itClus        TAITntuCluster itActClus
  msdClus       TAMSdntuCluster msdActClus
  twPoint       TATWntuPoint  twActPoint
  caClus        TACAntuCluster caActClus
  glbTrack     TAGntuGlbTrack  glbActTrack
Required Actions:
  actEvtReader  TAGactTreeReader
  . . .

```

MC Reconstruction (xi)

IncludeKalman: n
IncludeTOE: y
EnableLocalReco: y

- Global TOE reconstruction from L0 (i)

```
DecodeGlbToe -in 12C_C_200shoe_L0out.root -out 12C_C_200_GlbOut.root -exp 12C_200 -run 1 -nev 1000 -mc
```

```
===== Input Parameters =====  
Global debug level: 0  
Detectors included:  
- Dipole - Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -  
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created  
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:  
BeamEnergy:      0.200 GeV/u  
BeamAtomicMass:  12  
BeamAtomicNumber: 6  
BeamMaterial:    "C"  
TargetMaterial:  "C"  
TargetThickness: 0.500 cm  
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration  
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration  
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization  
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data  
Info in <GlobalToeReco::GlobalChecks()>: Make global reconstruction from L0 tree  
Info in <LocalRecoMC::GlobalChecks()>: Make global reconstruction with TOE
```

MC Reconstruction (xii)

- Global TOE reconstruction from L0 (ii)

```
TAGroot:
Known Actions:
  name          type
  actGeoTrafo   TAGgeoTrafo
  actCamMan     TAGcampaignManager
  locRecFile    TAGactTreeWriter
  evtReader     TAGactTreeReader
  glbActTrack   TAGactNtuGlbTrack
Known ParaDsc's:
  name          type
  tgGeo         TAGparGeo
. . .
Known DataDsc's:
  name          type          produced by
  vtTrack      TAVTntuTrack    evtReader
  vtVtx        TAVTntuVertex   evtReader
  vtClus       TAVTntuCluster  evtReader
  itClus       TAITntuCluster  evtReader
  msdClus      TAMSDntuCluster evtReader
  twPoint      TATWntuPoint   evtReader
  caClus       TACAntuCluster  evtReader
  eveMc        TAMCntuTrack  evtReader
  glbTrack     TAGntuGlbTrack  glbActTrack
Required Actions:
  locRecFile    TAGactTreeWriter
  glbActTrack   TAGactNtuGlbTrack
```

MC Reconstruction (xiii)

- Global GF reconstruction (i)

IncludeKalman:	y
IncludeTOE:	n
EnableLocalReco:	n

```
DecodeGlb -in 12C_C_200shoe.root -out 12C_C_200_1_Out.root -nev 1 -exp 12C_200 -run 1 -mc
```

```
===== Input Parameters =====
Global debug level: 0
Detectors included:
- Dipole - Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -
Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created
In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:
BeamEnergy:      0.200 GeV/u
BeamAtomicMass:  12
BeamAtomicNumber: 6
BeamMaterial:    "C"
TargetMaterial:  "C"
TargetThickness: 0.500 cm
Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration
Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration
Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization
Info in <LocalRecoMC::CampaignChecks()>: Reading MC data
Info in <LocalRecoMC::GlobalChecks()>: Make global reconstruction with GenFit
Info in <LocalRecoMC::GlobalChecks()>: Reading MC root file with shoe format
```

MC Reconstruction (xiv)

- Global GF reconstruction (ii)

```

TAGroot:
Known Actions:
  name          type
  actGeoTrafo   TAGgeoTrafo
  actCamMan     TAGcampaignManager
  locRecFile    TAGactTreeWriter
  actEvtReader  TAGactTreeReader
  stActNtu      TASTactNtuHitMC
  bmActNtu      TABMactNtuHitMC
  vtActNtu      TAVTactNtuHitMC
  itActNtu      TAITactNtuHitMC
  msdActNtu     TAMSdactNtuHitMC
  twActNtu      TATWactNtuHitMC
  caActNtu      TACAactNtuHitMC
  bmActTrack    TABMactNtuTrack
  vtActClus     TAVTactNtuClusterF
  vtActTrack    TAVTactNtuTrackF
  vtActVtx      TAVTactNtuVertexPD
  itActClus     TAITactNtuClusterF
  msdActClus    TAMSdactNtuCluster
  twActPoint    TATWactNtuPoint
  caActClus     TACAactNtuCluster
  glbActkFitter  TAGactKFitter
Known ParaDsc's:
  name          type
  tgGeo         TAGparGeo
  . . .

```

```

Known DataDsc's:
  name          type          produced by
  eveMc         TAMCntuTrack  actEvtReader
  stMc          TAMCntuHit    actEvtReader
  stRaw         TASTntuHit    stActNtu
  bmMc          TAMCntuHit    actEvtReader
  bmRaw         TABMntuHit    bmActNtu
  vtMc          TAMCntuHit    actEvtReader
  vtRaw         TAVTntuHit    vtActNtu
  itMc          TAMCntuHit    actEvtReader
  itRaw         TAITntuHit    itActNtu
  msdMc         TAMCntuHit    actEvtReader
  msdRaw       TAMSdntuHit   msdActNtu
  twMc          TAMCntuHit    actEvtReader
  twRaw        TATWntuHit    twActNtu
  caMc          TAMCntuHit    actEvtReader
  caRaw        TACAntuHit    caActNtu
  bmTrack       TABMntuTrack  bmActTrack
  vtTrack       TAVTntuTrack  vtActTrack
  vtVtx        TAVTntuVertex vtActVtx
  vtClus        TAVTntuCluster vtActClus
  itClus        TAITntuCluster itActClus
  msdClus       TAMSdntuCluster msdActClus
  twPoint       TATWntuPoint  twActPoint
  caClus        TACAntuCluster caActClus
  TAGntuGlbTrackK  TAGntuGlbTrackK  glbActkFitter
Required Actions:
  actEvtReader  TAGactTreeReader
  . . .

```

MC Reconstruction (xv)

IncludeKalman: y
IncludeTOE: n
EnableLocalReco: y

- Global GF reconstruction from L0 (i)

```
DecodeGlb -in 12C_C_200shoe_L0Out.root -out 12C_C_200_GlbOut.root -exp 12C_200 -run 1 -nev 1000 -mc
```

Input Parameters

Global debug level: 0

Detectors included:

- Dipole - Start Counter - Beam Monitor - Target - Vertex - Inner Tracker - Multi-Strip Detector - ToF Wall - Calorimeter -
Using GenFit for Global Reconstruction

Info in <TGeoManager::TGeoManager>: Geometry FOOT, FOOT Geometry created

In file ./geomaps/12C_200/TAGdetector.geo the following beam parameters for a 12C beam have been set:

BeamEnergy: 0.200 GeV/u
BeamAtomicMass: 12
BeamAtomicNumber: 6
BeamMaterial: "C"

TargetMaterial: "C"
TargetThickness: 0.500 cm

Info in <TABMparCal::FromFile>: Loading BM T0 calibration from file: ./calib/12C_200/TABM_T0_Calibration.cal

Info in <TADIgeoField::TADIgeoField()>: Going to open ./data/AsymmetricDipoles.table

Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Energy_Calibration.cal for calibration

Info in <TATWparCal::FromCalibFile()>: Open file ./calib/12C_200/TATW_Tof_Calibration.cal for calibration

Info in <TATWparCal::FromFileZID()>: Open file ./config/12C_200/TATW_BBparameters_12C_200.cfg for Bethe-Bloch parametrization

Info in <GlobalReco::CampaignChecks()>: Reading MC data

Info in <GlobalReco::GlobalChecks()>: Make global reconstruction from L0 tree

Info in <GlobalReco::GlobalChecks()>: Make global reconstruction with GenFit

MC Reconstruction (xvi)

- Global GF reconstruction from L0 (ii)

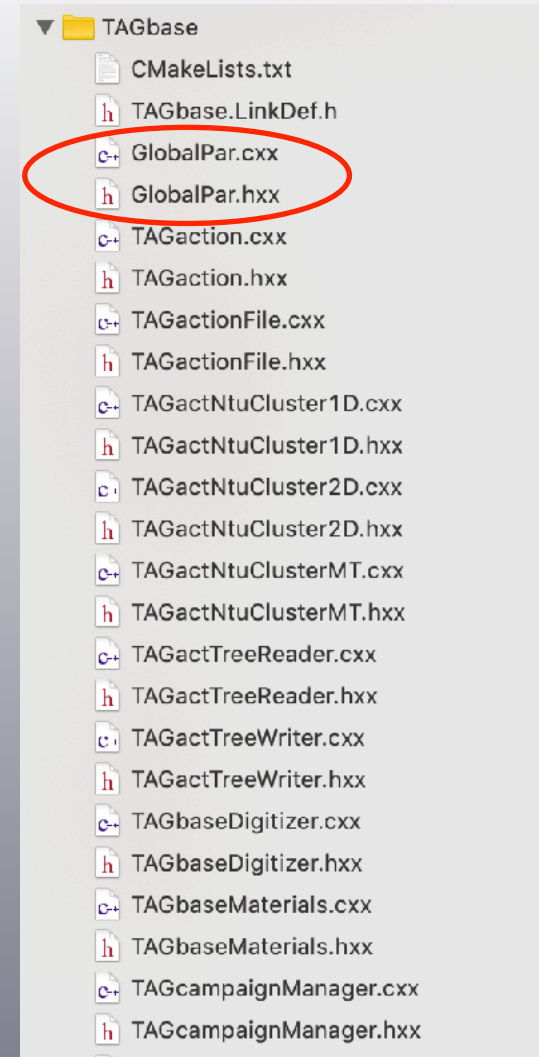
```
TAGroot:
Known Actions:
  name          type
  actGeoTrafo   TAGgeoTrafo
  actCamMan     TAGcampaignManager
  locRecFile    TAGactTreeWriter
  evtReader     TAGactTreeReader
  glbActkFitter TAGactKFitter
. . .
Known DataDsc's:
  name          type          produced by
  vtTrack      TAVTntuTrack  evtReader
  vtVtx        TAVTntuVertex evtReader
  vtClus       TAVTntuCluster evtReader
  itClus       TAITntuCluster evtReader
  msdClus      TAMSDntuCluster evtReader
  twPoint      TATWntuPoint  evtReader
  caClus       TACAntuCluster evtReader
  eveMc        TAMCntuTrack  evtReader
  evtMc        TAMCntuEvent  evtReader
  stMc         TAMCntuHit    evtReader
  bmMc         TAMCntuHit    evtReader
  vtMc         TAMCntuHit    evtReader
  itMc         TAMCntuHit    evtReader
  msdMc        TAMCntuHit    evtReader
  twMc         TAMCntuHit    evtReader
  caMc         TAMCntuHit    evtReader
  TAGntuGlbTrackK TAGntuGlbTrackK glbActkFitter
Required Actions:
  locRecFile    TAGactTreeWriter
  glbActkFitter TAGactKFitter
```

Conclusions

- New classes and actions for event and regions
- Add some info and watchdog outputs
- Simulations tested with Geant4 and Fluka converter (Txt2NtuRoot)
- Tested all reconstructions
 - Local L0 from MC with Fluka/shoe format and with or w/o region
 - Local L0 from Raw data
 - Global reconstruction from MC data or L0 tree with TOE or GenFit,
(exclude reconstruction from raw data, cannot be tested)
➔ Works fine, need the experts to check outputs
- Debugging and improvements
- All changes implemented in NewGeom branch, not pushed

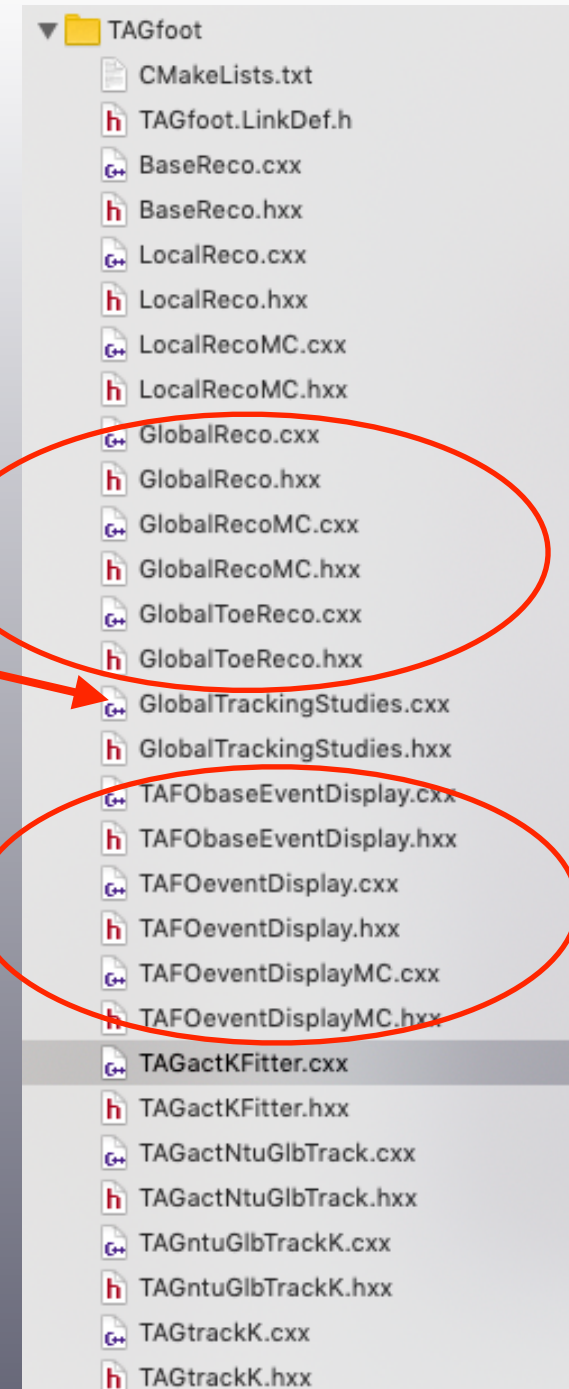
Outlook (i)

- Should change name of GlobalPar to TAGrecoManager to be coherent with TAGcampaignManager,
 - ➔ moreover GlobalPar is not related anymore **only** with global reconstruction



Outlook (ii)

- Should change name of TAFO*eventDisplay* to TAG*eventDisplay* to be coherent with other classes in folder
- Class GlobalTrackingStudies, still used ??
- **GlobalReco**, **GlobalRecoMC** and **GlobalToeReco** should be only at most two classes, reading back from L0 reconstruction tree
- As well we should only keep DecodeGlb.cc and DecodeGlbToe.cc with the difference in setting the global flag (TOE or GenFit). What for DecodeGlbMC.cc ??



Outlook (iii)

- TAGactKFitter, histograms still not saved in output root file
 - ➔ Still mixing up reconstruction with analysis
 - TAGntuGlbTrackK, still not have a branch saved in output root file
 - TAGtrackK different from TAGtrack
 - ➔ not compatible with Ilaria work.
 - ➔ will need two different analysis.
 - Folder TAGfoot starts to come crowdy in AdvancedKalmanGenfit branch with GF classes
 - ➔ added a dedicated folder (e.g.: TAGFbase) as for TOE (i.e.: TATOEbase)
- ➔ if people agree I will make the last changes and push into the branch

Details for Experts

Renaming for ST

- TASTntuRaw \mapsto TASTntuHit file
 - TASTntuHit \mapsto TASThit class
 - TASTntuRaw \mapsto TASTntuHit class
- TASTactNtuRaw \mapsto TASTactNtuHit file
 - TASTactNtuRaw \mapsto TASTactNtuHit class
- TASTdatRaw \mapsto TASTntuRaw file
 - TASTdatRaw \mapsto TASTntuRaw class

Renaming for BM

• TABMntuHit \mapsto TABMhit file

- TABMntuHit \mapsto TABMhit class

• TABMntuRaw \mapsto TABMntuHit file

- TABMntuRaw \mapsto TABMntuHit class

• TABMactNtuRaw \mapsto TABMactNtuHit file

- TABMactNtuRaw \mapsto TABMactNtuHit class

• TABMdatRaw \mapsto TABMntuRaw file

- TABMdatRaw \mapsto TABMntuRaw class

• TABMactDatRaw \mapsto TABMactNtuRaw file

- TABMactDatRaw \mapsto TABMactNtuRaw class

Renaming for VTX (i)

- TAVTactBaseNtuMC \mapsto TAVTactBaseNtuHitMC file
 - TAVTactBaseNtuMC \mapsto TAVTactBaseNtuHitMC class
- TAVTbaseNtuHit \mapsto TAVTbaseHit file
 - TAVTbaseNtuHit \mapsto TAVTbaseHit class
- TAVTntuHit \mapsto TAVThit file
 - TAVTntuHit \mapsto TAVThit class
- TAVTntuRaw \mapsto TAVTntuHit file
 - TAVTntuRaw \mapsto TAVTntuHit class
- TAVTactNtuRaw \mapsto TAVTactNtuHit file
 - TAVTactNtuRaw \mapsto TAVTactNtuHit class

Renaming for VTX (ii)

- TAITactNtuRaw \mapsto TAITactNtuHit file
 - TAITactNtuRaw \mapsto TAITactNtuHit class

Renaming for ITR

- TAITntuHit \mapsto TAIThit file
 - TAITntuHit \mapsto TAIThit class
- TAITntuRaw \mapsto TAITntuHit file
 - TAITntuRaw \mapsto TAITntuHit class
- TAITactNtuRaw \mapsto TAITactNtuHit file
 - TAITactNtuRaw \mapsto TAITactNtuHit class

Renaming for MSD

- TAMSDntuHit → TAMSDhit file
 - TAMSDntuHit → TAMSDhit class
- TAMSDntuRaw → TAMSDntuHit file
 - TAMSDntuRaw → TAMSDntuHit class

Renaming for TW

- TATWntuRaw \mapsto TATWntuHit file
 - TATWntuHit \mapsto TATWhit class
 - TATWntuRaw \mapsto TATWntuHit class

- TATWactNtuRaw \mapsto TATWactNtuHit file
 - TATWactNtuRaw \mapsto TATWactNtuHit class

- TATWdatRaw \mapsto TATWntuRaw file
 - TATWdatRaw \mapsto TATWntuRaw class

Renaming for CA

- TACAntuRaw \mapsto TACAntuHit file
 - TACAntuHit \mapsto TACAhit class
 - TACAntuRaw \mapsto TACAntuHit class
- TACAactNtuRaw \mapsto TACAactNtuHit file
 - TACAactNtuRaw \mapsto TACAactNtuHit class
- TACAdatRaw \mapsto TACAntuRaw file
 - TACAdatRaw \mapsto TACAntuRaw class

Renaming for Reco

• BaseReco file

- fpNtuRaw* \mapsto fpNtuHit* members
- GetNtuRaw*() \mapsto GetNtuHit*() methods

• LocalReco file

- fActNtuRaw* \mapsto fActNtuHit* members

• LocalRecoMC file

- fActNtuRaw* \mapsto fActNtuHit* members