EMC Full Simulation

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SuperB Collaboration Meeting
Full Simulation Session

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Bruno and EMC simulation

- EMC related studies with Bruno
  - Background studies (EMC + Background group)
  - Performance evaluation (EMC)
  - Test Beam simulation (EMC)
  - Fwd PID material impact on performances (EMC, DGWG, Fwd PID Task Force)
  - Alternative geometries performance evaluation (EMC)

Latest developments

- **Main effort in Digitization and Reconstruction**
  - Starting from Bruno output data not (yet) part of the Bruno code
- **FEE**
  - FEE volumes on the back of crystals
  - FEE related variables in output ntuples
- **Alternative geometries for Fwd Endcap**
  - LYSO, BGO, Pure CsI
    - PWO will be added soon
- **Run time Fwd endcap geometry recongnition**
  - No need to set variables or to specify options
  - Based on material and volume names

Crystal sensitivization

Almost everything based on material and volume name
(similar situation for other subdetectors)

```
// Forward endcap EMC calorimeter
 if( theName == "emcLSO" || theName == "emcLYSO" || theName == "emcBGO" ){
  int xtal_r_index(0);
      ....
  sscanf( theLogicalVolume->GetName() , "FWD_RING_%i",&xtal_r_index);
      ....
  theLogicalVolume->SetSensitiveDetector(myScorer[ xtal_r_index - 1 + xtals_barrel]);

 } else if( theName == "emcPureCsI" ){
  int xtal_r_index(0);
      ...
  sscanf( theLogicalVolume->GetName() , "EM1C_R%i",&xtal_r_index);

  theLogicalVolume->SetSensitiveDetector(myScorer[ xtal_r_index - 1 + xtals_barrel]);
 }
```

We hope to have only one geoemtry (crystal) option ASAP

Future developments and whishlist

- **Easy future developments**
  - Additional alternative geometries for Fwd EMC endcap
    - PWO
    - Mixed or non LYSO-like geometries
  - Post processing macros

- **Long standing issues**
  - Time dependence of energy deposit
    - No clear idea how to implement it
    - May have impact on event data size
    - Significant impact on post processing macros (Digitization)
  - Full Sim – Fast Sim cross check

- **Future**
  - What about reconstruction?
    - Not needed for background studies
    - For performance evaluation studies I already faced limitations from the lack of (high level) informations from other subdetectors