HFCC Muon Detector R&D

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L3s: Reinhard Schwienhorst schwier@msu.edu – Drift tubes + Scintillator strips

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The US institutes expressed interests and their expertise

Boston University (ATLAS MDT, FE, L0MDT)

Brookhaven National Laboratory (ATLAS CSC, MM, ASIC)

Florida Institute of Technology (CMS Muon, GEM)

Harvard University (ATLAS MDT, FE, MM TP)

Jefferson Lab (MPGD/μ-RWELL facility)

Michigan State University (ATLAS sMDT)

Northeastern University (CSM End-cap Muon system)

Tufts University (ATLAS Muon detector alignment)

SLAC (ATLAS CSC TDAQ, Silicon FE, Scintillator strips, SiPM)

University of California, Davis (CMS Forward Pixels, endcap muon)

University of California, Irvine (ATLAS CSC, TDAQ, L0MDT)

University of Florida (CMS CSC, muon gas system)

University of Massachusetts, Amherst (ATLAS NSW TP, L0MDT)

University of Michigan (ATLAS MDT/sMDT, ASIC, FE, TDAQ)

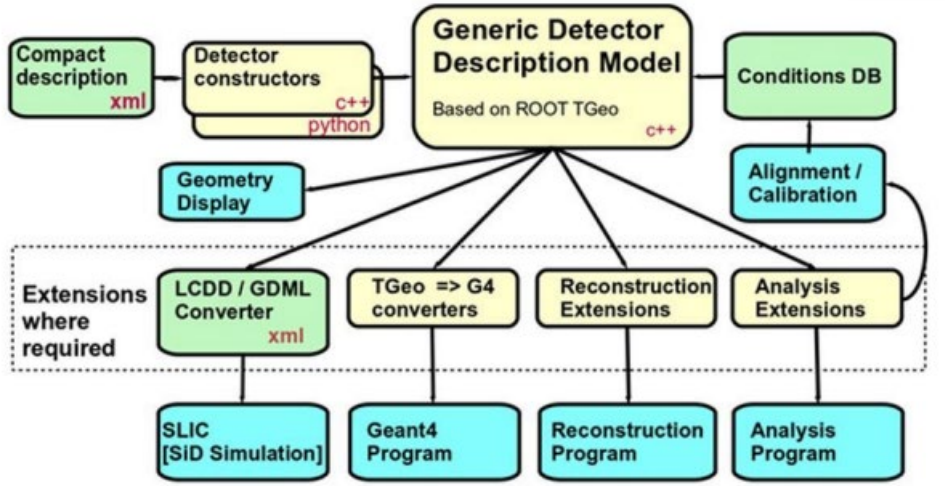
University of Wisconsin (CSM Muon, trigger system)

Fermilab (Scintillator strip extrusion facility)

Univ. of Washington (ATLAS MDT, DCS)

The current simulation work

Detector Description Toolkit for High Energy Physics



The on-going simulation work at the Univ. of Michigan for FCC-ee for Muon drift tubes and inner straw tracker

-- with DD4HEP framework (based on GEANT4, ROOT, ACTS,…)

-- with Garfield for drift tube cell electric/magnetic field, signal properties, RT functions,…

UM people working on simulations

-- Jianming Qian (faculty in charge, UM simulation contact)

-- Liang Guan (Research Staff, Garfield simulation on straws, and squared drift tubes)

-- Kevin Nelson (Postdoc, DD4HEP simulation)

-- Chihao Li (Postdoc, DD4HEP, geometry of straw tracker, ACTS)

-- Two UM undergraduate students

What we would like to work together with the US simulation group

-- Set up GEANT4 geometry (with envelops, Pixel, inner tracker, EM and HCAL (with proper radiation length/interaction length for the calorimeter), and Muon system, possibly magnetic field, critic for muon punch through studies, and Muon ID/tag)

-- Develop dedicated CPU/GPU and storage for simulations and for test beam data analysis

-- Generate several bench mark MC samples (final particles with 4-vector, and distributions) – leptons, jets,…