Contribution ID: **133**   Type: **Oral**

ATLAS Simulation using Real Data: Embedding and Overlay

Tuesday, 11 October 2016 14:45 (15 minutes)

or some physics processes studied with the ATLAS detector, a more
accurate simulation in some respects can be achieved by including real
data into simulated events, with substantial potential improvements in the CPU,
disk space, and memory usage of the standard simulation configuration,
at the cost of significant database and networking challenges.
Real proton-proton background events can be overlaid (at the detector
digitization output stage) on a simulated hard-scatter process, to account for pileup
background (from nearby bunch crossings), cavern background, and
detector noise. A similar method is used to account for the large
underlying event from heavy ion collisions, rather than directly
simulating the full collision. Embedding replaces the muons found in
Z->mumu decays in data with simulated taus at the same 4-momenta, thus
preseving the underlying event and pileup from the original data
event. In all these cases, care must be taken to exactly match
detector conditions (beamspot, magnetic fields, alignments, dead sensors, etc.)
between the real data event and the simulation.

We will discuss the current status of these overlay and embedding techniques
within ATLAS software and computing.

Primary Keyword (Mandatory)

Simulation

Secondary Keyword (Optional)

Tertiary Keyword (Optional)

Primary author: HAAS, Andrew (New York University)

Presenter: HAAS, Andrew (New York University)

Session Classification: Track 2: Offline Computing

Track Classification: Track 2: Offline Computing