Muon Collider Full Simulation Studies

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Update

Progress faily slow last week
- So far, we have used single bunch crossing event simulated for BIB process, need more statistics.
- sent email to Lorenzo about accessing BIB samples (or generating them) with multiple bunch crossing events, waiting for response.

Next steps:
- use SkipNEvents feature while generating single event with 100% BIB overlay (limitation of configuration setup).
- look into jet daughter particles ntuples (using PandoraPF Objects to cluster particles), some unclear features like number of daughter particles and their energy distribution.

Recall: Origin of fake jets

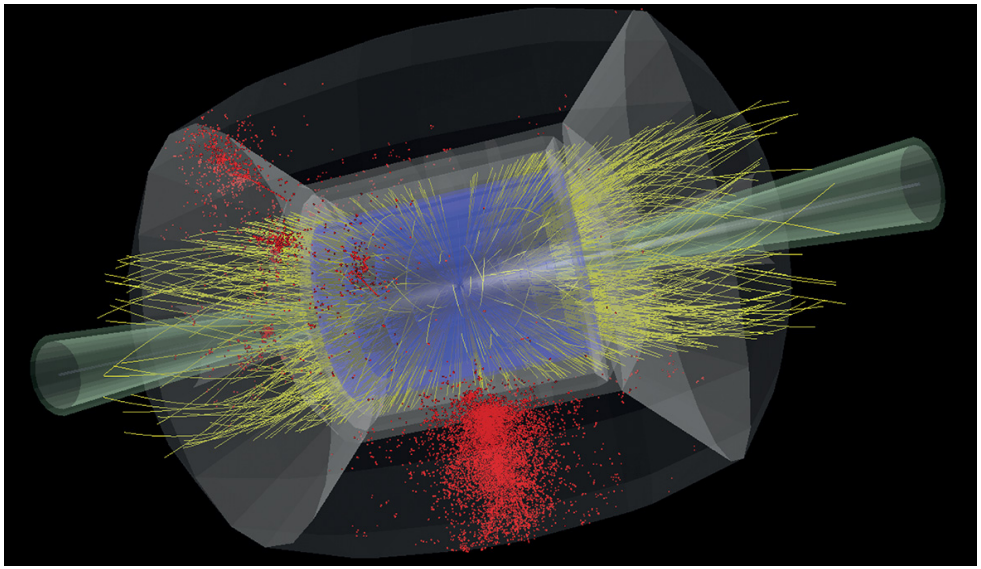


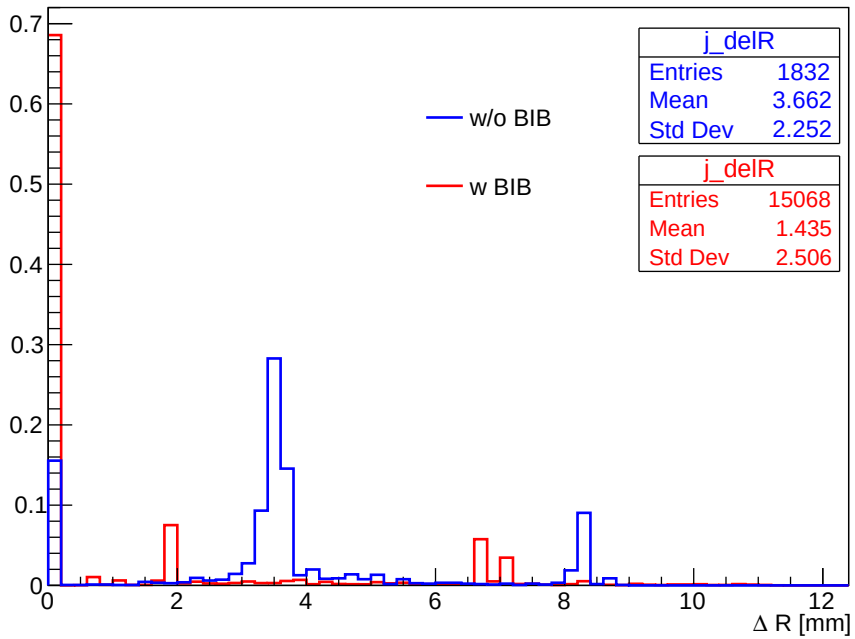
Figure: Simulation of $H \rightarrow b\bar{b}$ in presence of BIB. Credit: D Lucchesi et al

Jet substructure

For jets and its daughter particles, (E, Px, Py, Pz) info stored as TLorentzVector Jet

Then access its 'position' and 'time' (Jet.X(), Jet.Y(), Jet.Z(), Jet.T())

$$R = \sqrt{X^2 + Y^2} \text{ and } \Delta R = |R_{max} - R_{min}|$$



Small transverse width ΔR for BIB/fake jets.