

Progress on CEPC Software

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IHEP

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Bug fixed

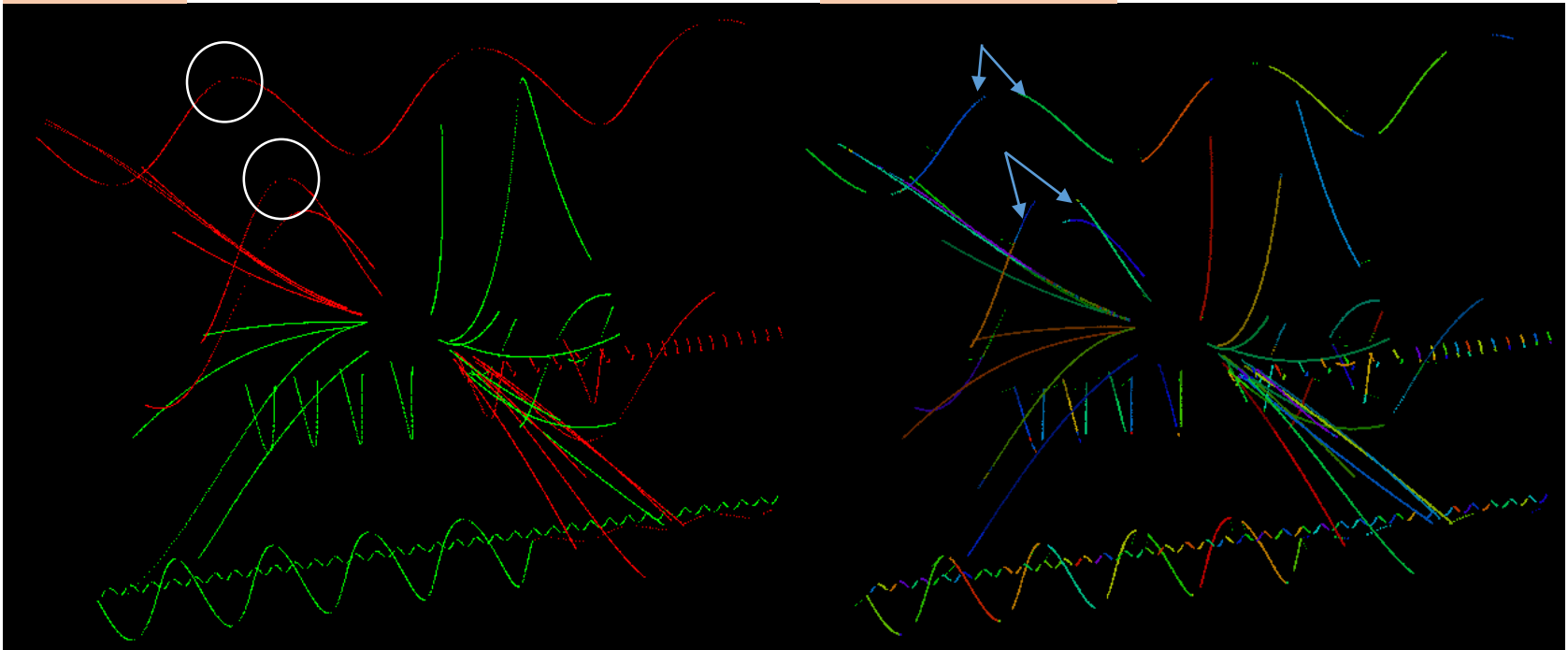
- MCParticle's simulation status
 - Decay in simulation: always true (bug)
- After fixed, through `isCreatedInSimulation()` to divide the MC particles to generator's and secondary particles in simulation
- Once `cepcgit` works, it will release as soon as possible

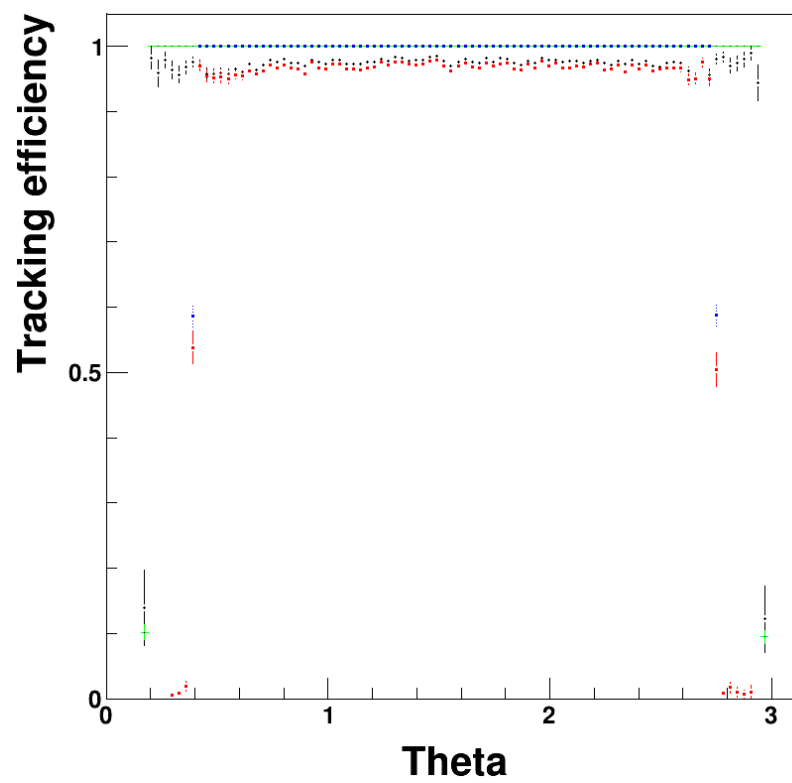
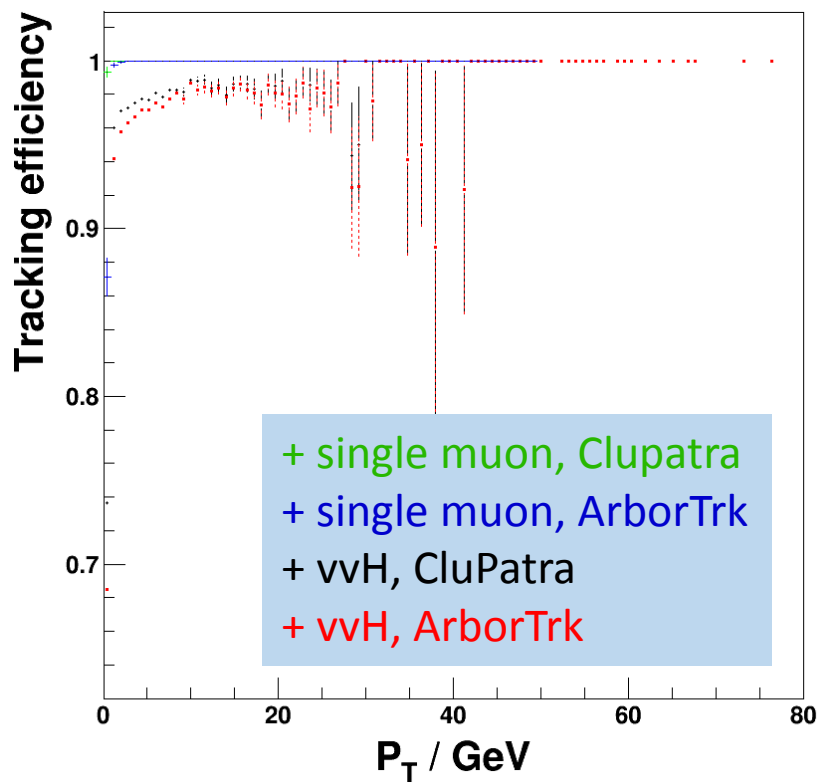
New Tracking Algorithm based on Arbor

- Arbor for track finding + ArborTrk for fitting

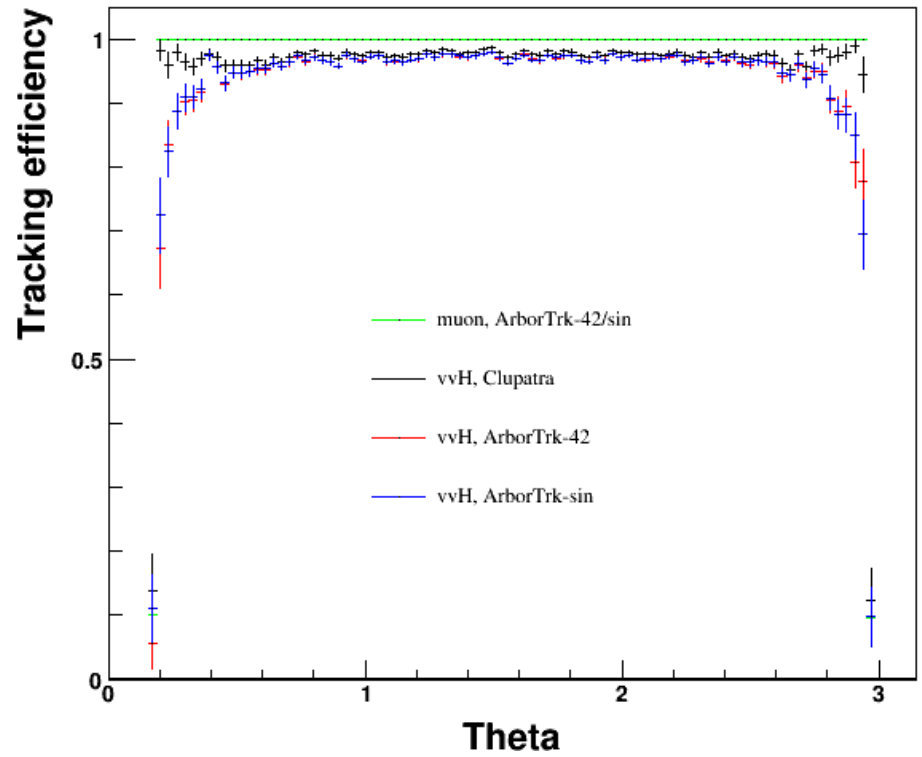
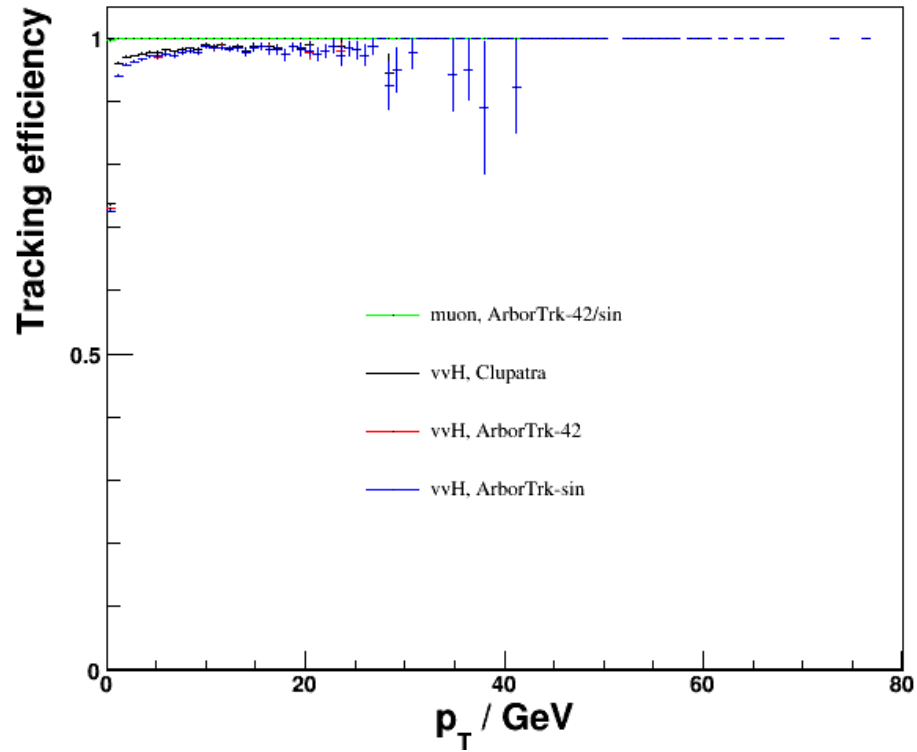
TPC hits

Arbor branches





ArborTrk-42: threshold 42mm
ArborTrk-sin: threshold 16mm/sin θ



New Geometry Interface

- Sub-detector driver: GeneralInterface

- For existing detector construction: [G4VUserDetectorConstruction](#) inherited class

- Example: TestConstruction

- `G4VPhysicalVolume* TestConstruction::Construct()` for standalone simulation



- `void TestConstruction::Construct(G4LogicalVolume* worldLog, VSensitiveDetector* sd)`



`G4bool GeneralInterface::ContextualConstruct(const CGAGeometryEnvironment &, G4LogicalVolume *)`

General Sensitive Detector

- CalSD(G4String SDname, G4double zEndcap, G4double halfsize) for calorimeter
- S,M,I,J,K
 - S: barrel vs endcap, $z < 0$ vs $z > 0$
 - M: sector in phi direction
 - K: history->GetVolume(1)->GetCopyNo()
 - I: history->GetVolume(0)->GetCopyNo()
 - J=0 (in general, it is difficult to be calculated, relative with arrangement)
- halfsize = distance threshold to merge to same hit
 - If size=0, there will be huge hits for calorimeter
 - Approximate to half of cell size
 - Position of cells are not fixed
- General TrkSD for tracker is similar and more simple without merging

Roadmap for New Sub-detector

- Use GeneralInterface to integrate quickly
- Rough analysis result to decide whether develop
- Hopeless, removed from plan
- Or study more based on GeneralInterface
- Once develop, build customized driver and define sensitive detector