EM-Physics status

Mihály Novák

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General physics framework and EM-physics have been completed:

- model for positron-electron annihilation into 2 gammas has been added recently
- the simulation circle has been completed with this: the physics framework handles all type of interactions (continuous, discrete and at-rest) in a general way
- all EM model has been reimplemented recently: each model can sample final state either using sampling tables or rejection (a flag before init.)
- EM shower can be simulated in case of any detectors
- applications (examples, both with G4 and GV):
  - TestEm5: simulation of particle transmission through a simple slab (configurable target and gun)
  - TestEm3: general (configurable from macro) simplified sampling calorimeter simulation to study EM shower simulation
  - fullCMS: general (gdml based geometry) simulation with fully configurable particle gun (primary type, energy, direction, randomisation, etc.); can be used with any gdml file (as long as the [0,0,0] primary vertex position is fine)

Current State

particle	processes	model(s)	
		GeantV	**Geant4**
e^-	ionisation	Møller [100eV-100TeV]	Møller [100eV-100TeV]
	bremsstrahlung	Seltzer-Berger [1keV-1GeV]	Seltzer-Berger [1keV-1GeV]
		Tsai (Bethe-Heitler) w. LPM. [1GeV-100TeV]	Tsai (Bethe-Heitler) w. LPM. [1GeV-100TeV]
	Coulomb sc.	GS MSC model [100eV-100TeV]	Urban MSC model [100eV-100MeV]
			Mixed model [100MeV-100TeV]
e^+	ionisation	Bhabha [100eV-100TeV]	Bhabha [100eV-100TeV]
	bremsstrahlung	Seltzer-Berger [1keV-1GeV]	Seltzer-Berger [1keV-1GeV]
		Tsai (Bethe-Heitler) w. LPM. [1GeV-100TeV]	Tsai (Bethe-Heitler) w. LPM. [1GeV-100TeV]
	Coulomb sc.	GS MSC model [100eV-100TeV]	Urban MSC model [100eV-100MeV]
			Mixed model [100MeV-100TeV]
	annihilation	Heitler (2γ) [0-100TeV]	Heitler (2γ) [0-100TeV]
γ	photoelectric	Sauter-Gavrila + EPICS2014 [1eV-100TeV]	Sauter-Gavrila + EPICS2014 [1eV-100TeV]
	incoherent sc.	Klein-Nishina$^+$ [100eV-100TeV]	Klein-Nishina$^+$ [100eV-100TeV]
	e^-e^+pair production	Bethe-Heitler$^+$ [100eV-80GeV]	Bethe-Heitler$^+$ [100eV-80GeV]
		Bethe-Heitler$^+$ w. LPM [80GeV-100TeV]	Bethe-Heitler$^+$ w. LPM [80GeV-100TeV]
	coherent sc.	-	Livermore
+	energy loss fluct.	-	Urban