Scintillation Process in GATEv9.0

Issue #346 (by Han Gyu Kang)

Scintillation Process does NOT work in GATEv9.0 #346

Open **hangyookang** opened this issue on Jun 9 · 3 comments

hangyookang commented on Jun 9

Scintillation Process does NOT work in GATEv9.0

Recently, I installed GATEv9.0 on my Ubuntu Linux PC with Geant4 10.06.p02.
The "GATE_USE_OPTICAL" option was turned ON during the installation.

After GATE installation, I checked that everything works fine except the scintillation process.
The optical.mac in the benchImaging folder is working well as it uses "opticalphoton" as a source.
I checked that Cerenkov process is also working.
However, "Scintillation Process" is NOT working in GATEv9.0 optical simulation.

Is there any one who validated in "scintillation process" in GATEv9.0?

Issue (Jun 9, 2020)

wrzof commented 6 hours ago Contributor

Hi,

For me either, the combination gatev9 + geant4 10.06 doesn't produce scintillation. I advice you to use geant4 10.05 for the moment. We will try to figure out what it is happening.

In release note of geant4 10.06 (http://geant4-data.web.cern.ch/geant4-data/ReleaseNotes/ReleaseNotes4.10.6.html), I only found a mention to scintillation :

> G4Cerenkov, G4Scintillation, G4SynchrotronRadiation, G4VTransitionRadiation: added registration/de-registration mechanism.

For now, I do not know if it is related to our problem.

Fix (Oct 21, 2020)

Fix issue

Fix issue #346 #368

Open wrzof wants to merge 1 commit into `OpenGATE:develop` from `wrzof:fix_scintillation_with_geant4_10.06`

Conversation 0 | Commits 1 | Checks 9 | Files changed 3

wrzof commented 2 hours ago — Contributor

This pull request aims to fix issue #346.

Implementation of IsApplicable in GateScintillation to get back behaviour of geant4 10.05.

IsApplicable has been changed between geant4 10.05 and geant4 10.06 which made Scintillation not applicable for gamma. Because gamma has a PDGCharge of 0.0. Here we go back to previous implementation until we find another solution (ie without bypassing geant4).

Code in geant4 10.05:

```
G4bool G4Scintillation::IsApplicable(const G4ParticleDefinition& aParticleType)
{
       if (aParticleType.GetParticleName() == "opticalphoton") return false;
       if (aParticleType.IsShortLived()) return false;

       return true;
}
```

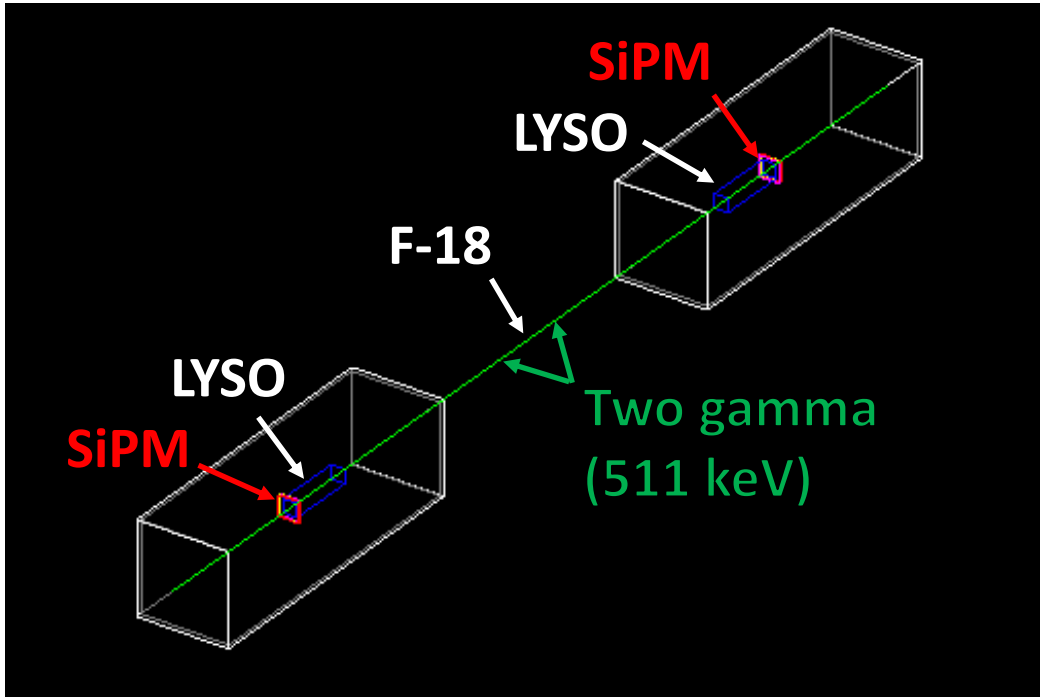
Code in geant4 10.06:

```
G4bool G4Scintillation::IsApplicable(const G4ParticleDefinition& aParticleType)
{
       return (aParticleType.GetPDGCharge() == 0.0 ||
              aParticleType.IsShortLived()) ? false : true;
}
```

Scintillation Process in GATEv9.0

GATEv9.0 + Geant4.10.06.p02

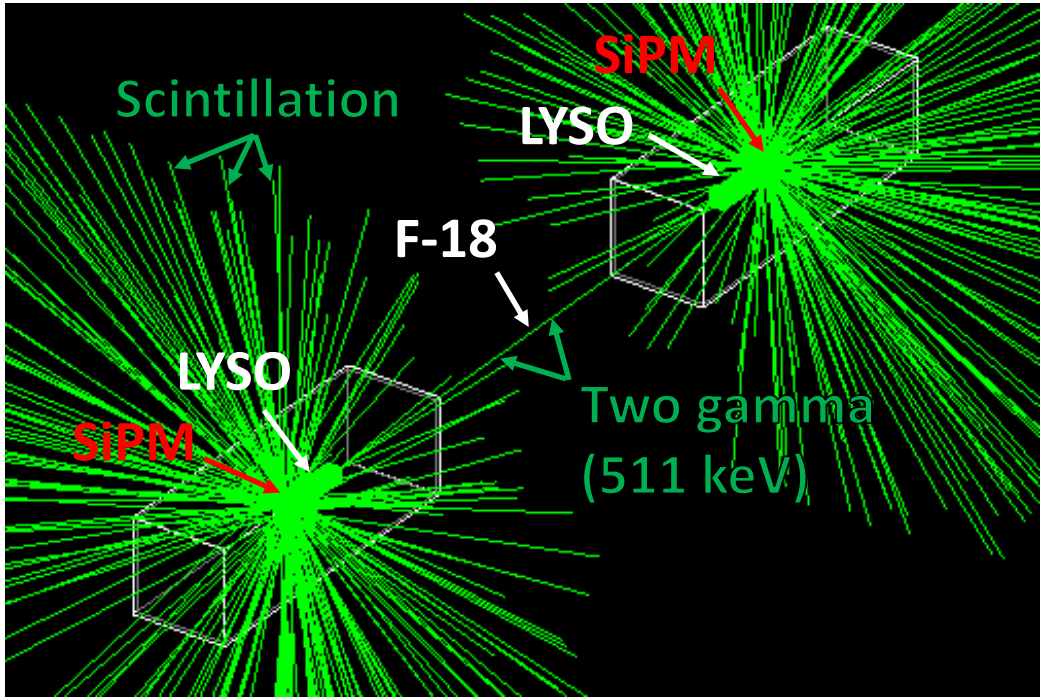
Scintillation Process does NOT work




```
G4bool G4Scintillation::IsApplicable(const G4ParticleDefinition&
aParticleType)
{
{ return (aParticleType.GetPDGCharge() == 0.0 ||
aParticleType.IsShortLived()) ? false : true; }
}
```

GATEv9.0 + Geant4.9.05.p01

Scintillation Process does work!




```
G4bool G4Scintillation::IsApplicable(const G4ParticleDefinition&
aParticleType)
{
if (aParticleType.GetParticleName() == "opticalphoton") return false;
if (aParticleType.IsShortLived())
return false; return true;
}
```