원자력의학원 데이터 미팅
(GATEv7.1 GPU 시뮬레이션)

2015.07.17.

강한규

내용

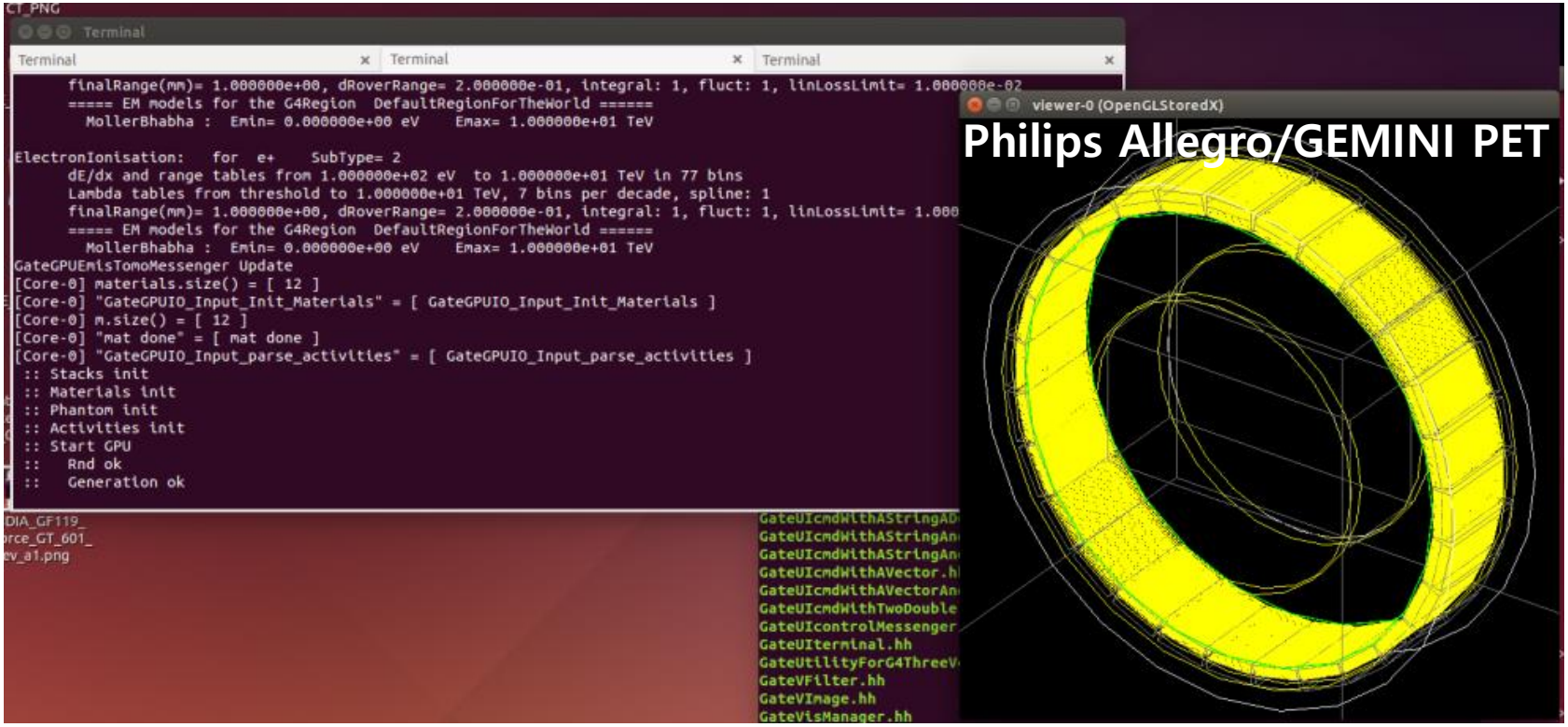
- GATEv7.1 및 CUDA 설치 조건
- GPU example 시뮬레이션 결과
- CPU vs. GPU 시뮬레이션 시간 비교

GATE 설치 조건

- ✓ **Ubuntu 14.04.1 LTS**
- ✓ CLHEP 2.2.0.4
- ✓ cmake-2.8.10.2
- ✓ **CUDA-v7.0**
- ✓ root_v5.34.30
- ✓ **Geant4.10.01.p02**
- ✓ **GATEv7.1**

GPU PET 시뮬레이션

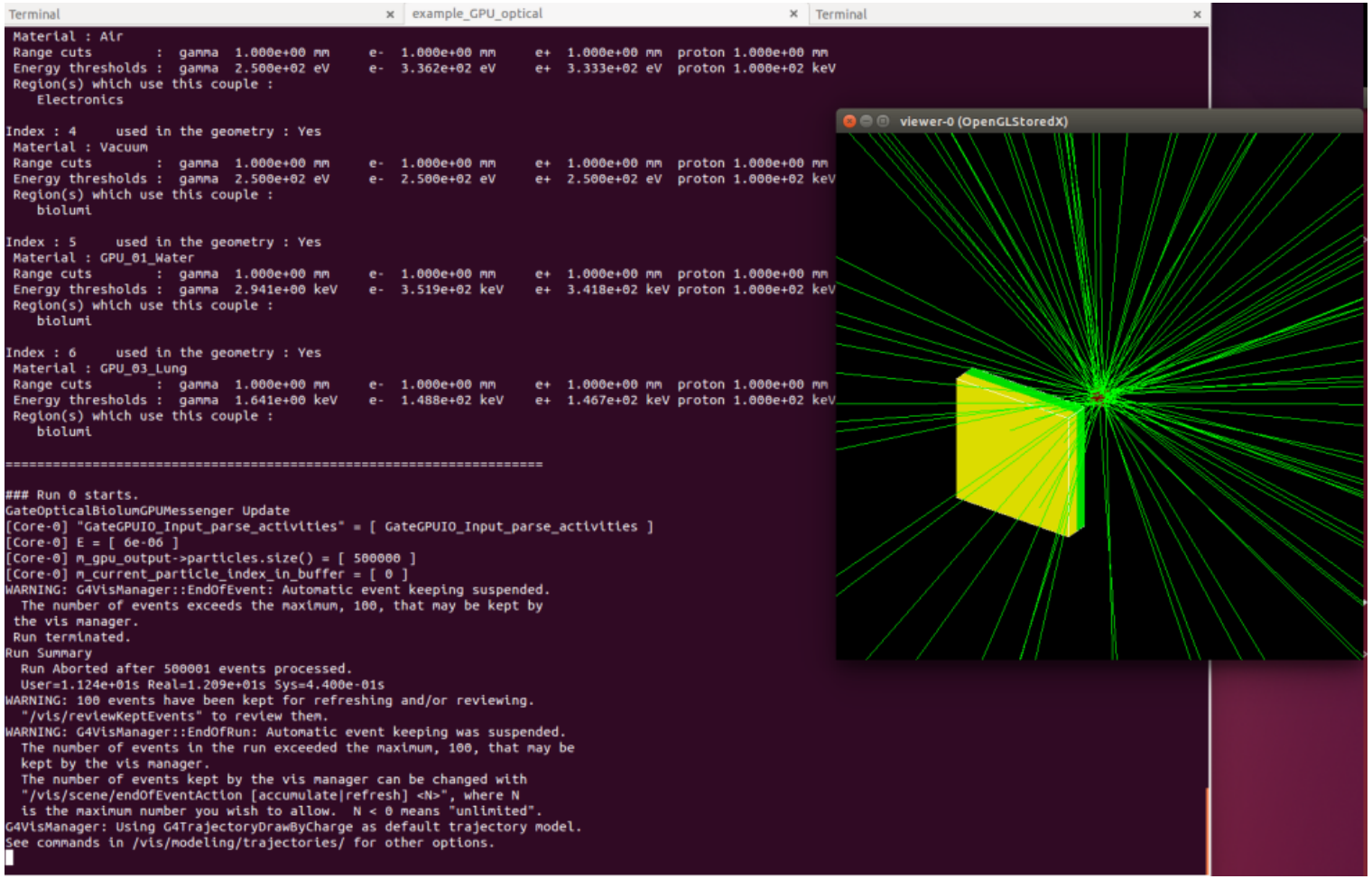
- ✓ Voxelized-source(PET)
- ✓ Voxelized-phantom(CT)



Validation of a Monte Carlo simulation of the Philips Allegro/GEMINI PET systems using GATE (2006_PMB)

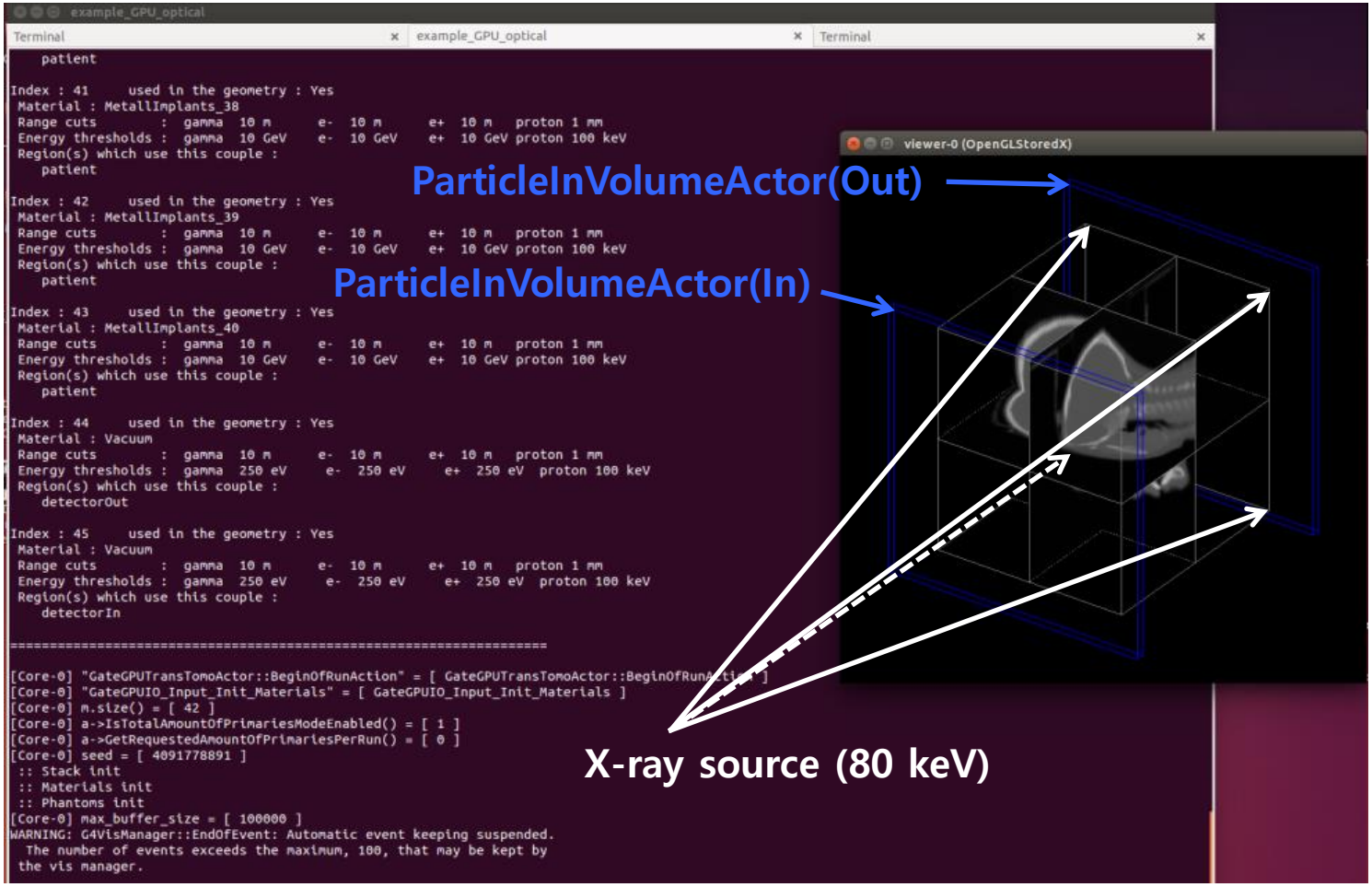
GPU Optical 시뮬레이션

- ✓ Voxelized-source(optical)
- ✓ Voxelized-phantom(CT)



GPU CT 시뮬레이션

- ✓ source(80 keV photon)
- ✓ Voxelized-phantom(CT)



GPU vs. CPU simulation time 비교

	PET	Optical	CT
CPU/GPU	**3.7**	**4.1**	**7.3**

GPU가 CPU에 비해 약 4배 정도 시뮬레이션 시간이 빠름.

PET	CPU	GPU	CPU/GPU
User [sec]	101.4	27.2	**3.7**
Real [sec]	101.4	32.5	**3.1**
System [sec]	0.03	5.4	**0.01**