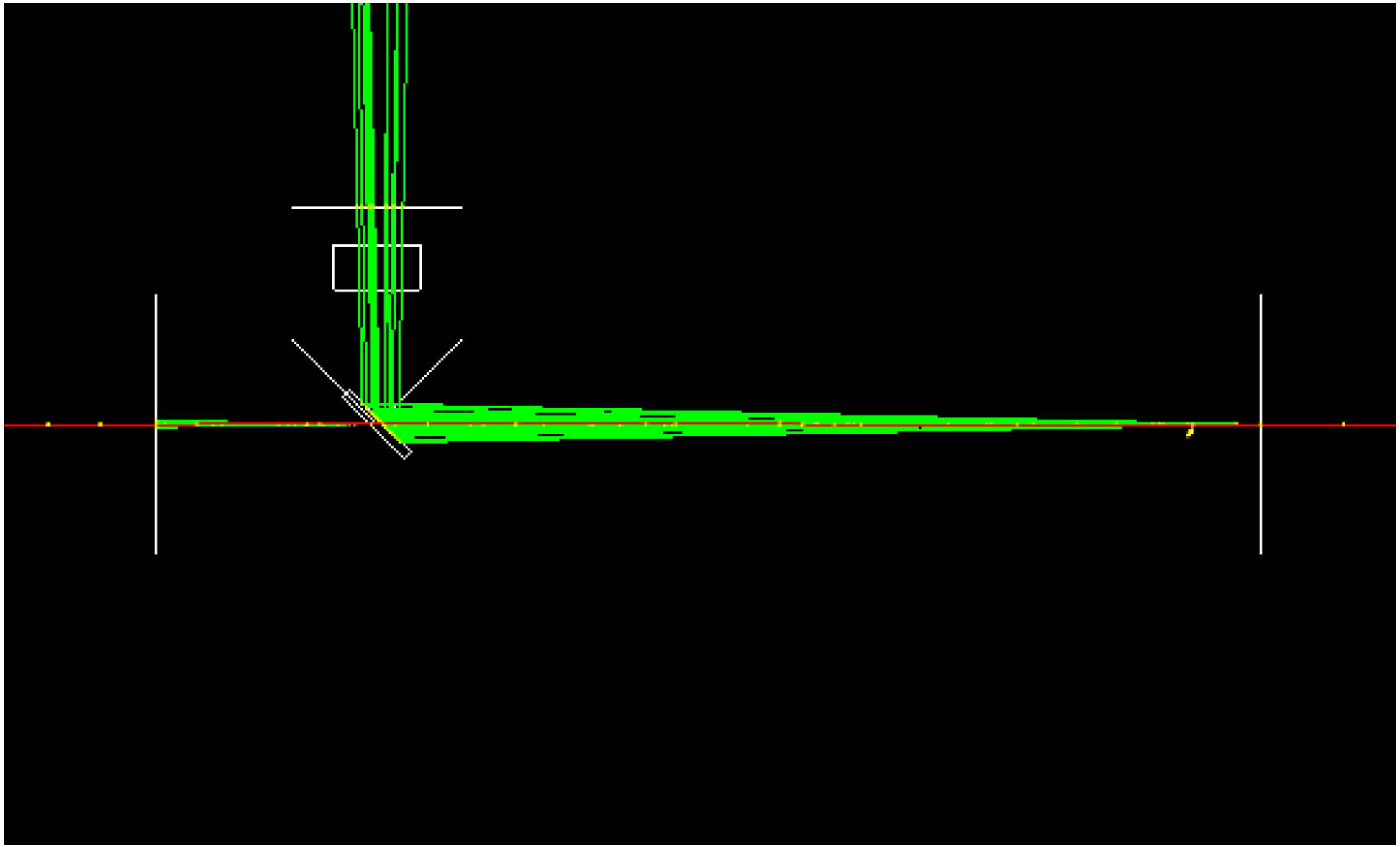
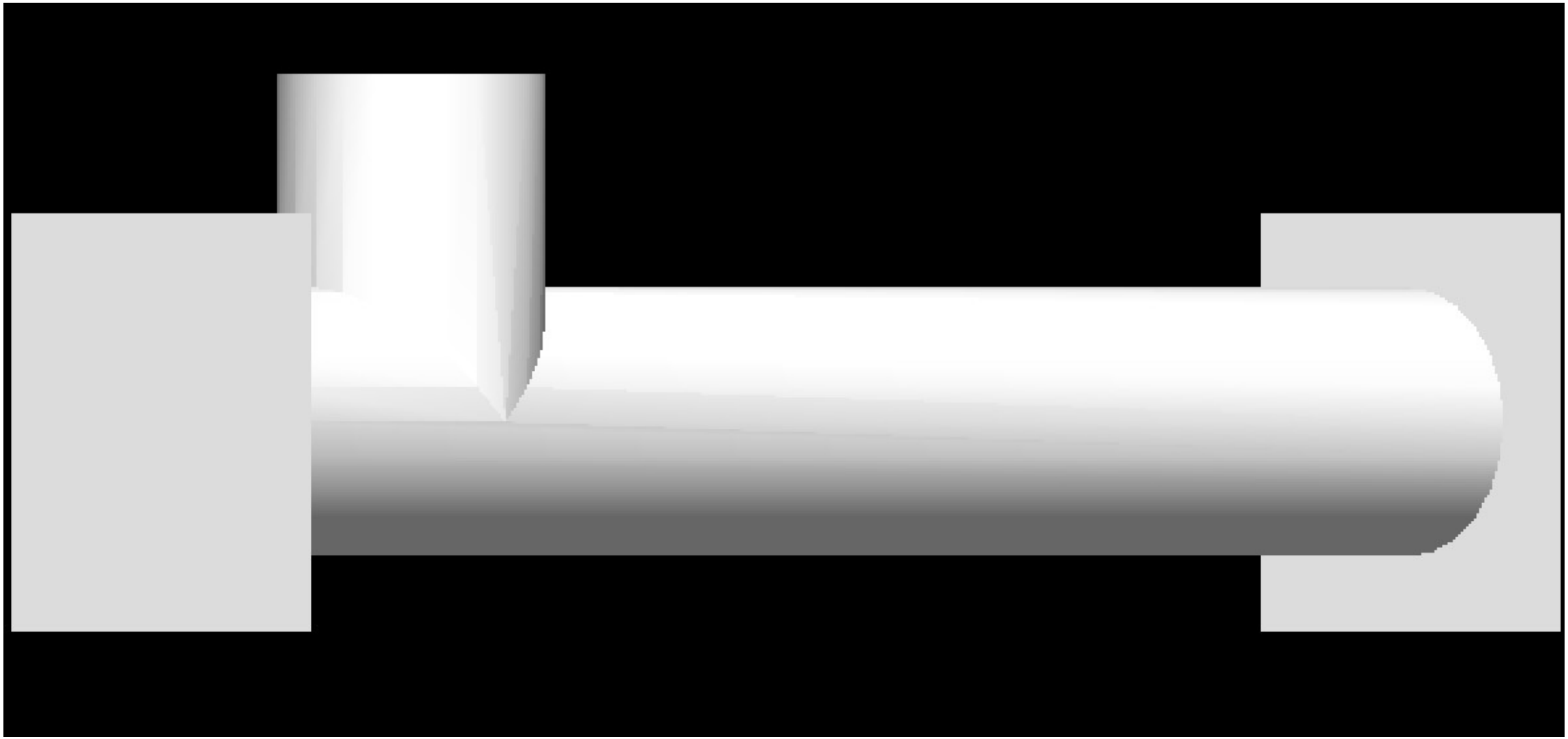
Cherenkov radiation Prototype

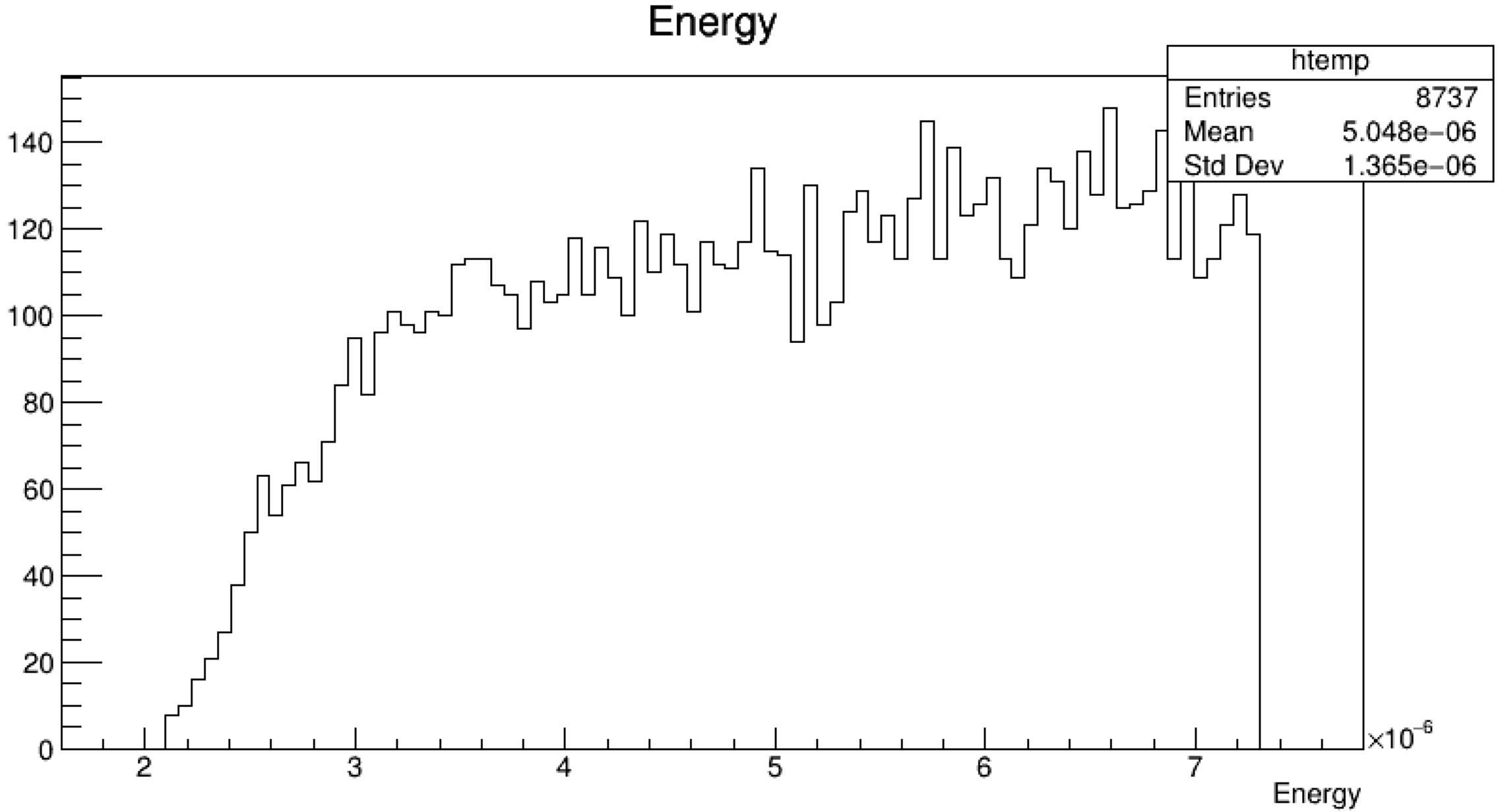
Cherenkov radiation is an electromagnetic radiation emitted when a charged particle (such as an electron) passes through a dielectric medium at a speed greater than the phase velocity of light in that medium.

Procedure:

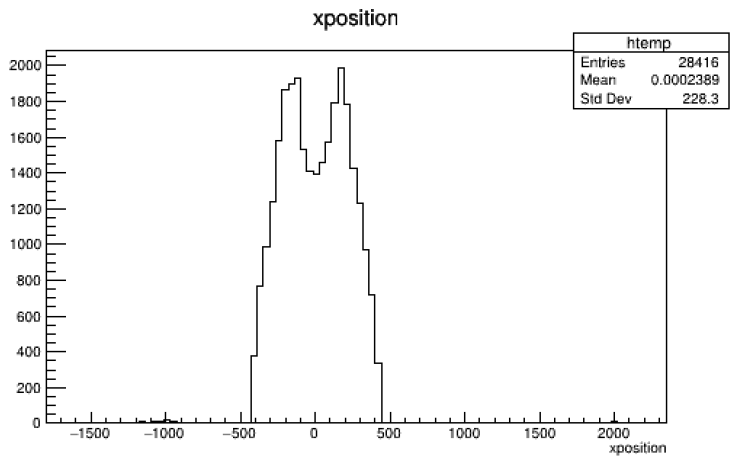
- Cherenkov radiation: enable in PhysicsList
- User build detector geometry: Detectorconstruction
- “not silent”: assign sensitive detector in detector construction
- Feel photons: UserHit class
- Collect information： g4root

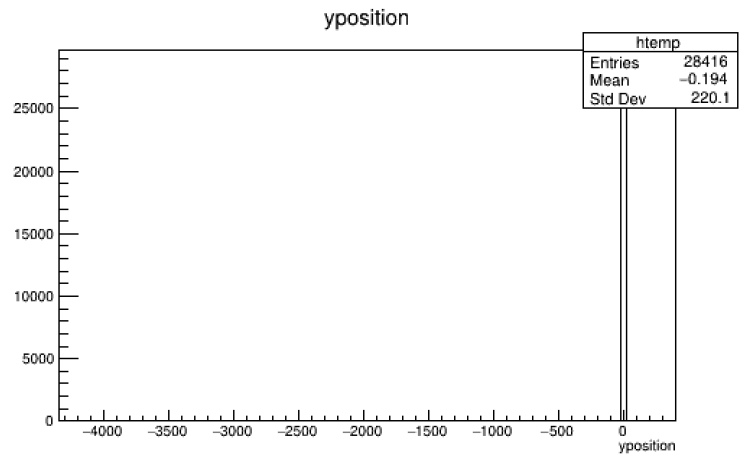


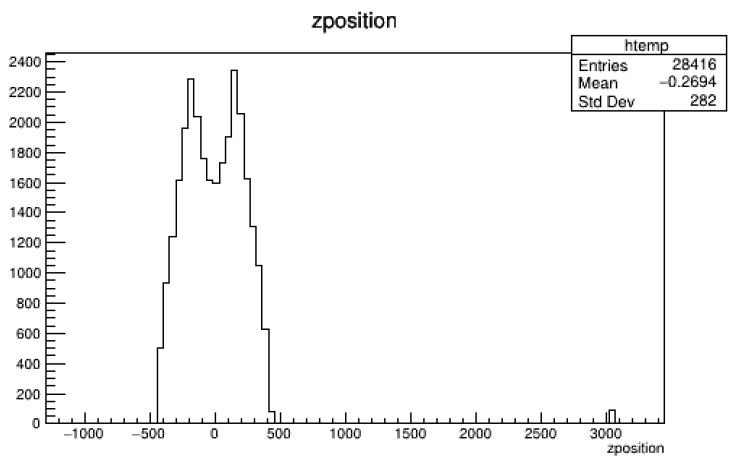


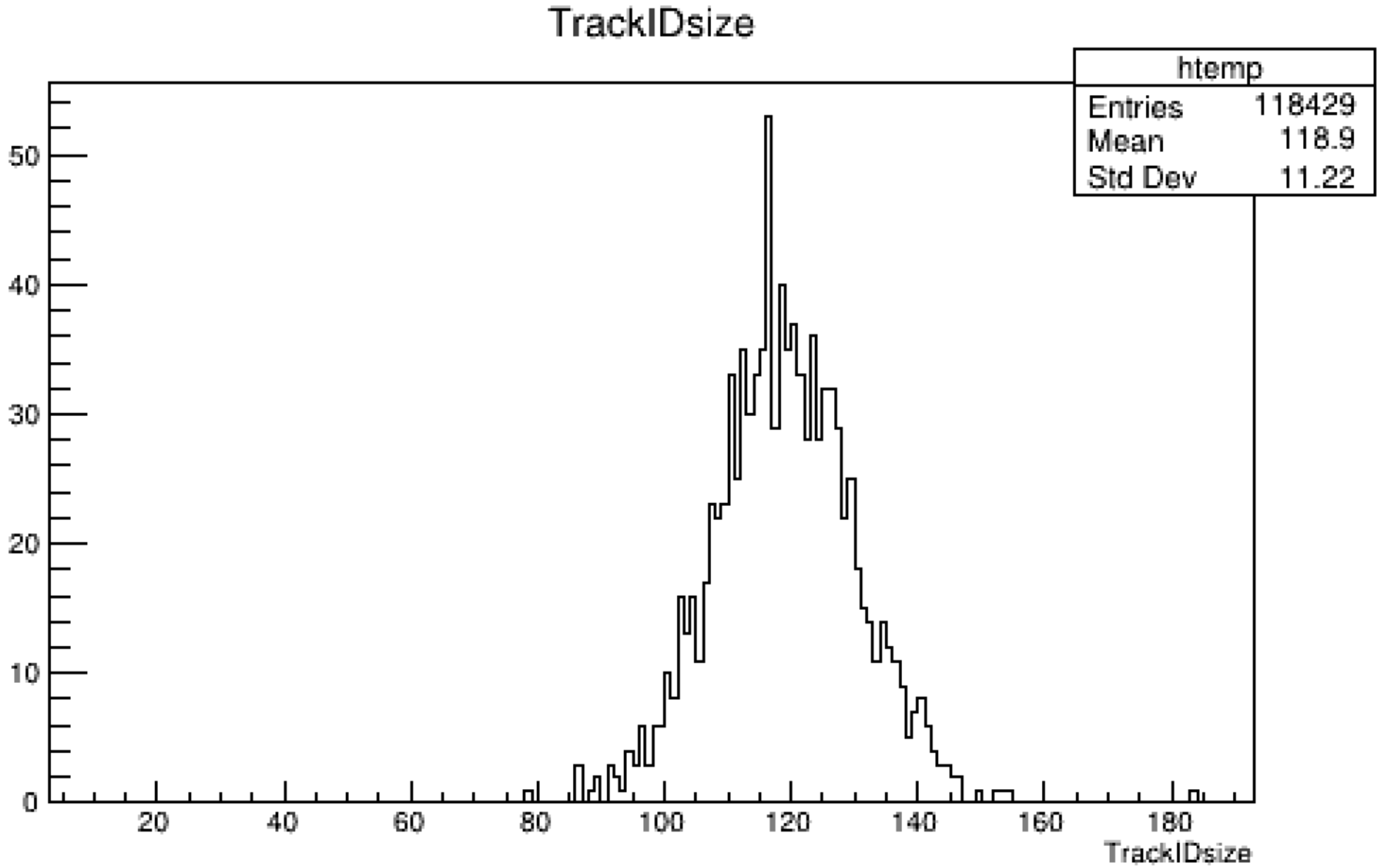


GeV(xaxis unit)

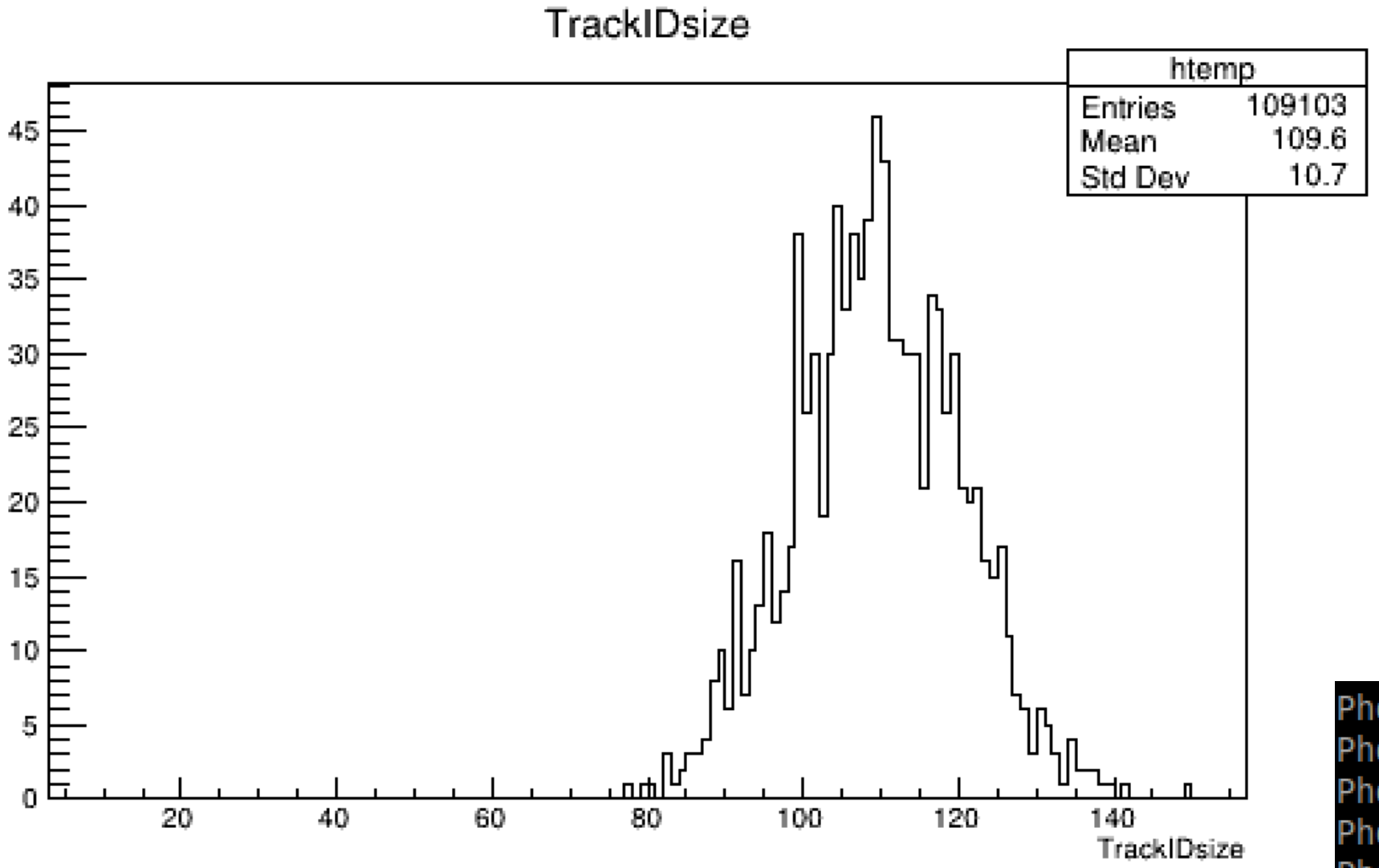

xposition
htemp
Entries 28416
Mean 0.0002389
Std Dev 228.3
xposition


yposition
htemp
Entries 28416
Mean −0.194
Std Dev 220.1
yposition


zposition
htemp
Entries 28416
Mean −0.2694
Std Dev 282
zposition



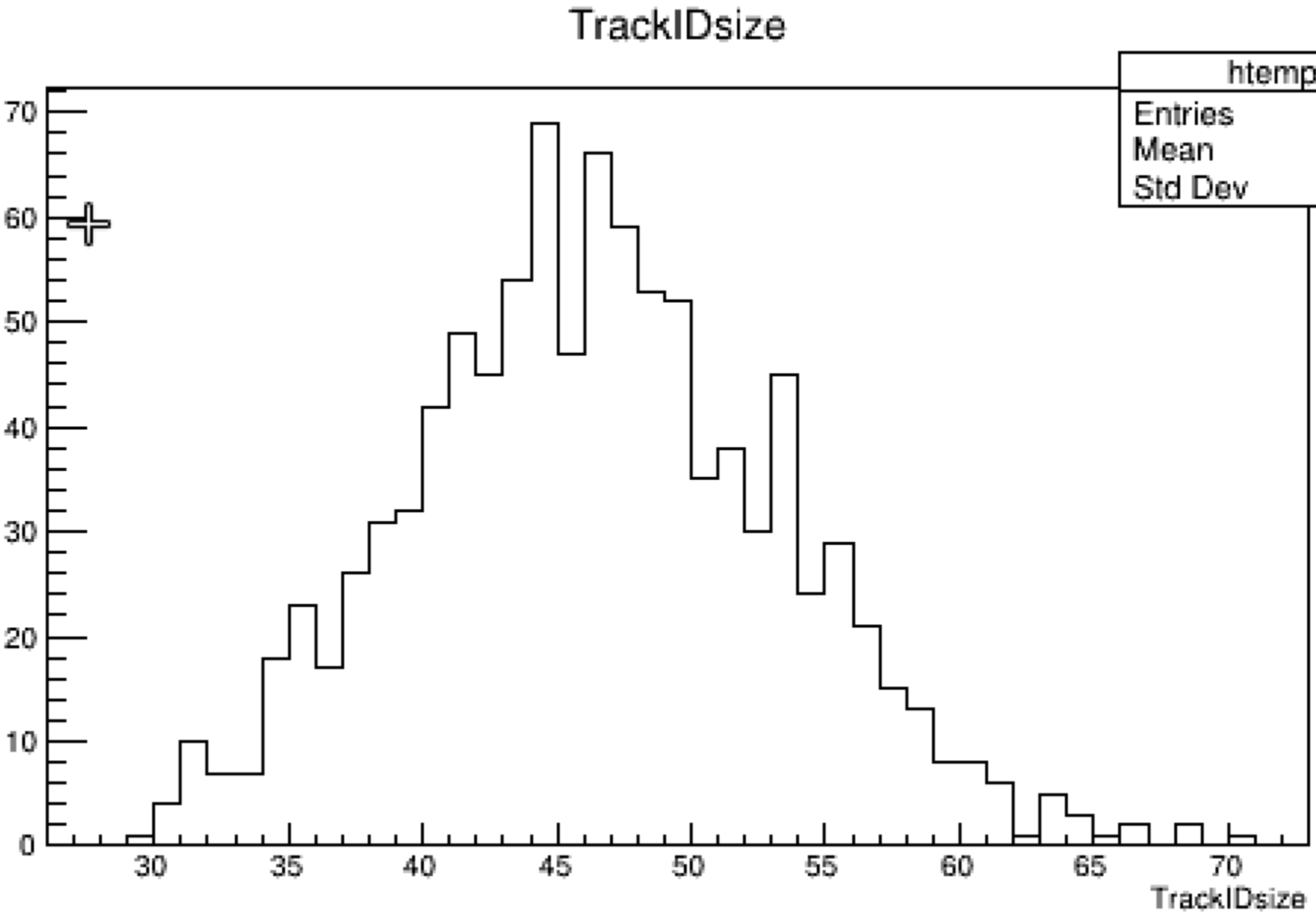
No reflection index
No quantumefficiency



With mirror reflection
No quantum efficiency

```
PhotonE(eV) 0.16129  R 0.926655
PhotonE(eV) 0.241935  R 0.923656
PhotonE(eV) 0.322581  R 0.924148
PhotonE(eV) 0.403226  R 0.923191
PhotonE(eV) 0.483871  R 0.916591
PhotonE(eV) 0.564516  R 0.905015
PhotonE(eV) 0.806452  R 0.944501
PhotonE(eV) 1.6129  R 0.980384
PhotonE(eV) 3.22581  R 0.98431
PhotonE(eV) 8.06452  R 0.988442
```

Wavelength (μm):		0.2	0.3	0.4	0.5	0.6	0.7	1.0	2.0	4.0	10.0
Aluminum*	*n*:	0.12	0.28	0.49	0.77	1.20	1.83	1.35	2.15	6.43	25.3
	k:	2.30	3.61	4.86	6.08	7.26	8.31	9.58	20.7	39.8	89.8



With mirror reflection
With quantum efficiency