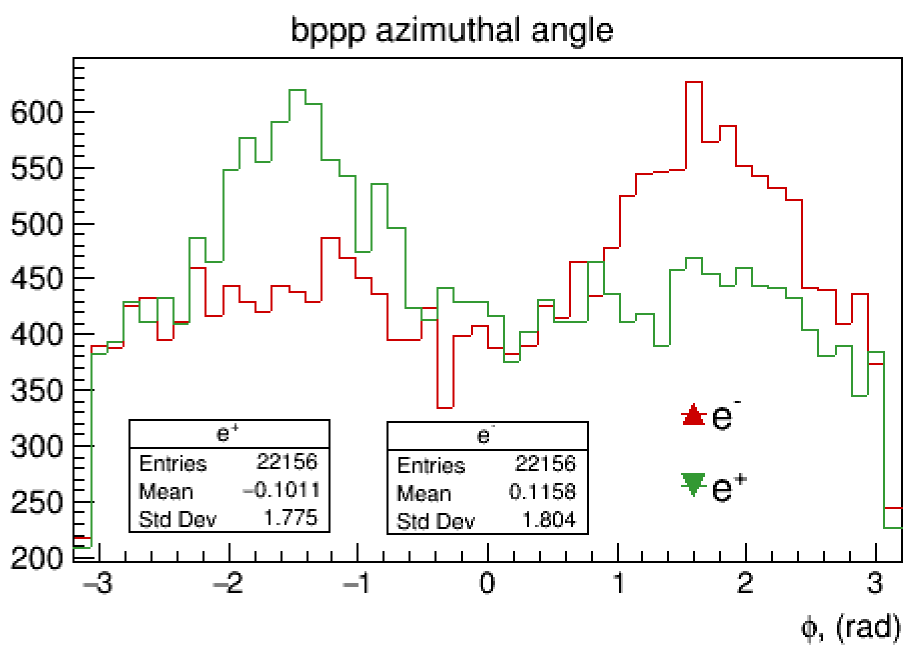
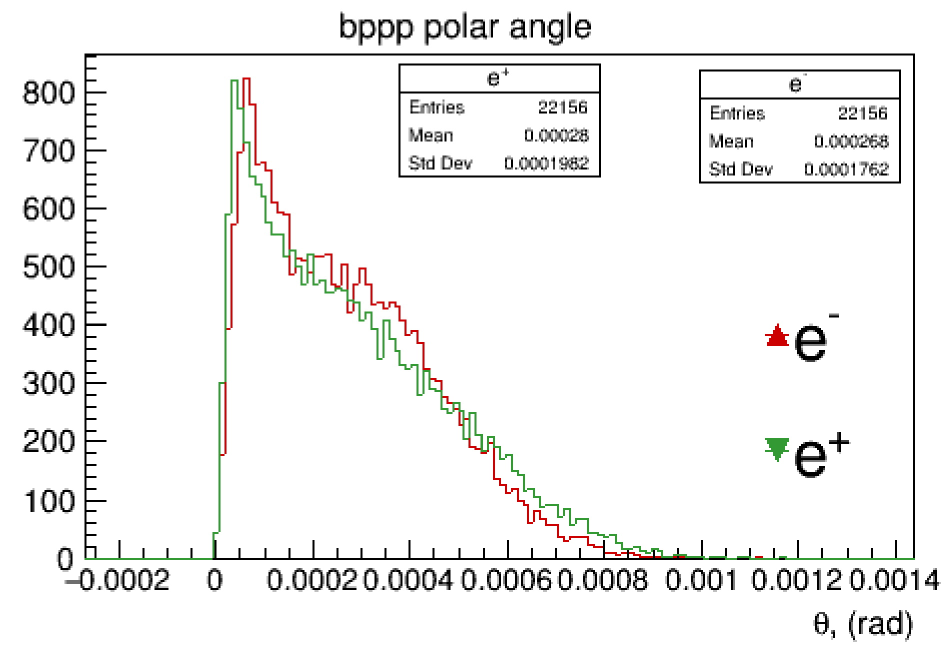
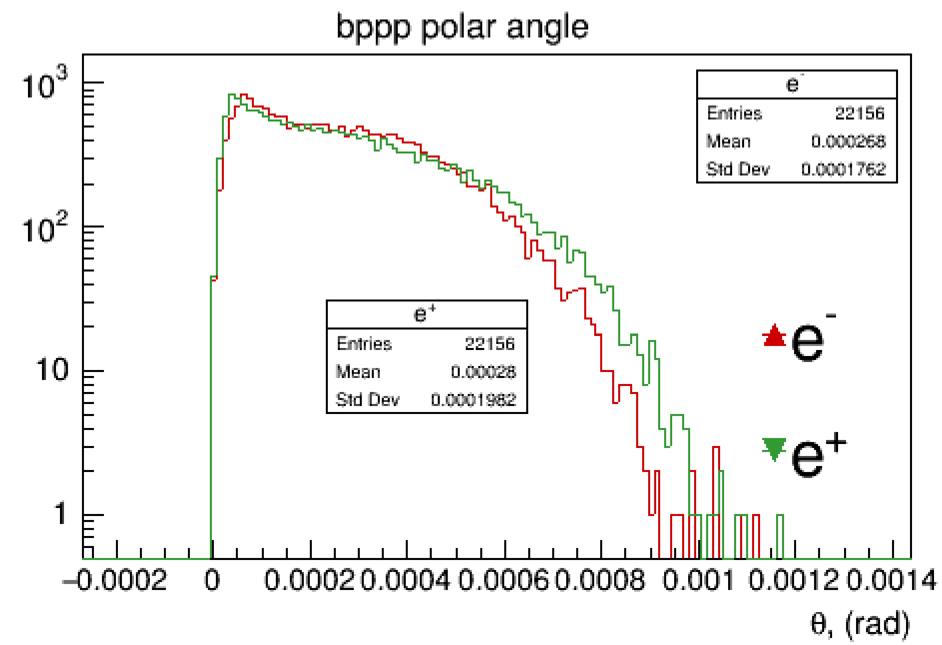
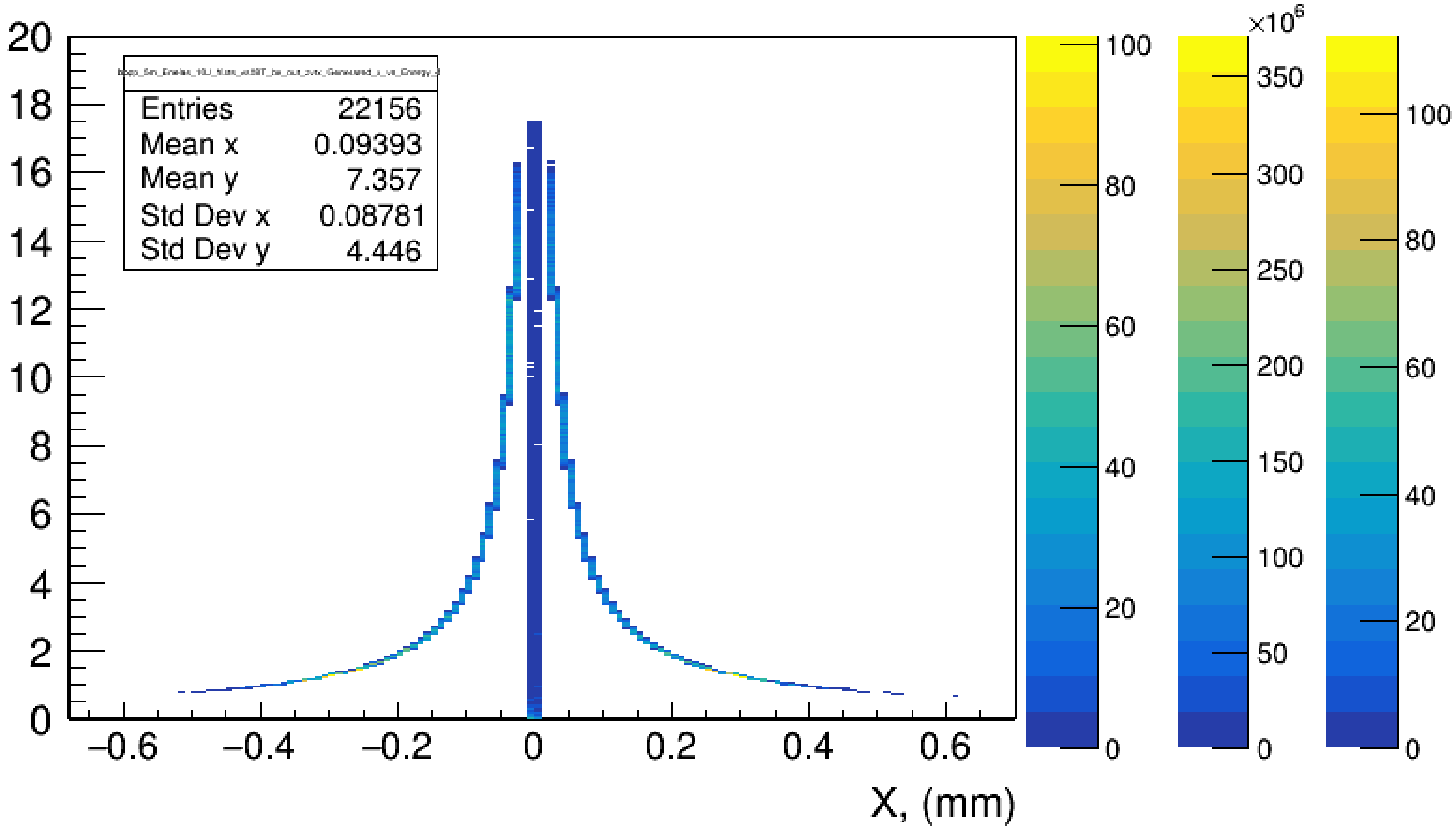
e- e+ φ and θ angles distribution









Entries 22156
Mean x 0.09393
Mean y 7.357
Std Dev x 0.08781
Std Dev y 4.446
20
18
16
14
12
10
8
6
4
2
0
−0.6
−0.4
−0.2
0
0.2
0.4
0.6
X, (mm)
100
80
60
40
20
0
×10^6
350
300
250
200
150
100
50
0
100
80
60
40
20
0

LUXE AFS shared directory

Shared directory for luxe group:

/afs/desy.de/group/flc/luxe

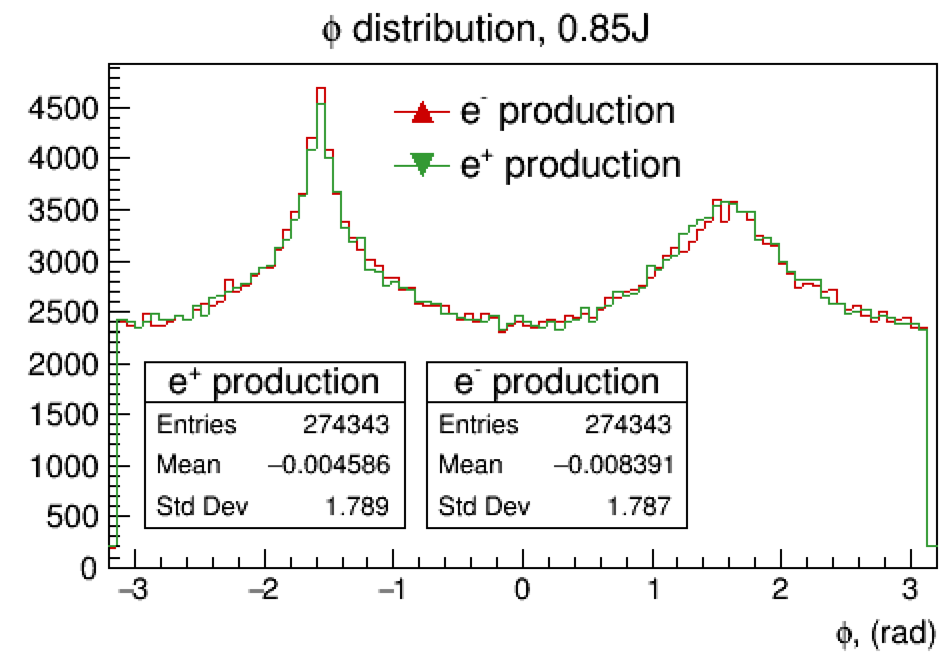
```
[oborysov@naf-ilc12 macro]$ fs listquota /afs/desy.de/group/flc/luxe --human
Volume Name                     Quota       Used %Used   Partition
g.flc.16914A5D452              500.0G       2.0K    0%          0%
```

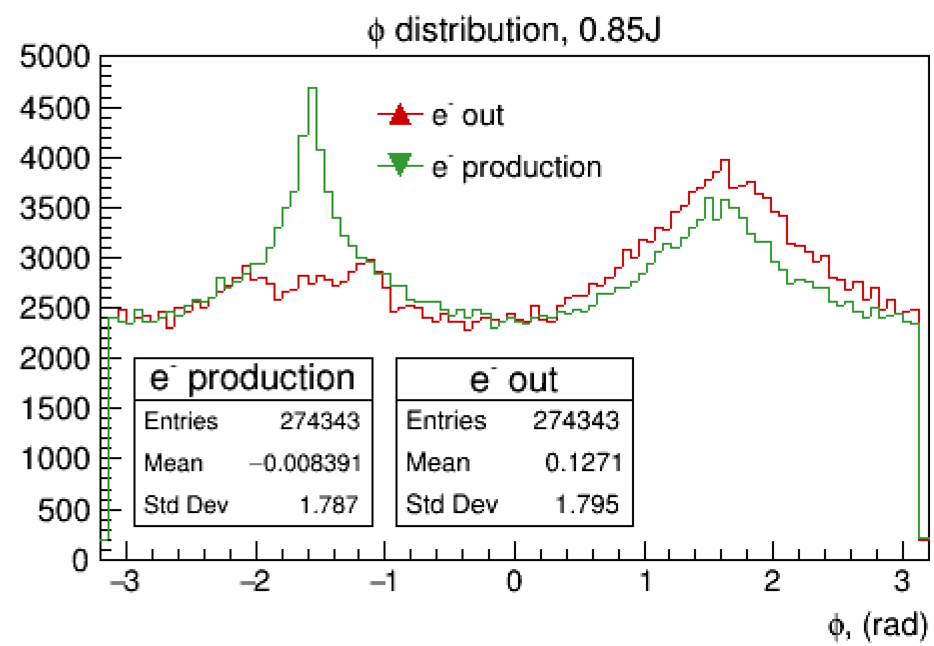
List group members: pts members usg:luxe

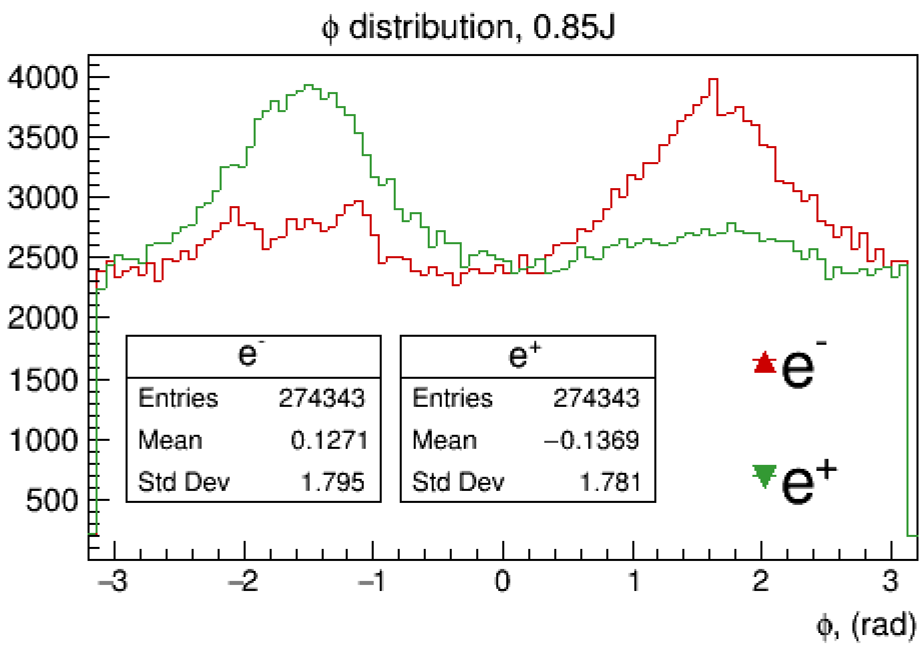
AFS fs command can be used to share also (for reading) a directory in /afs/….pool/...

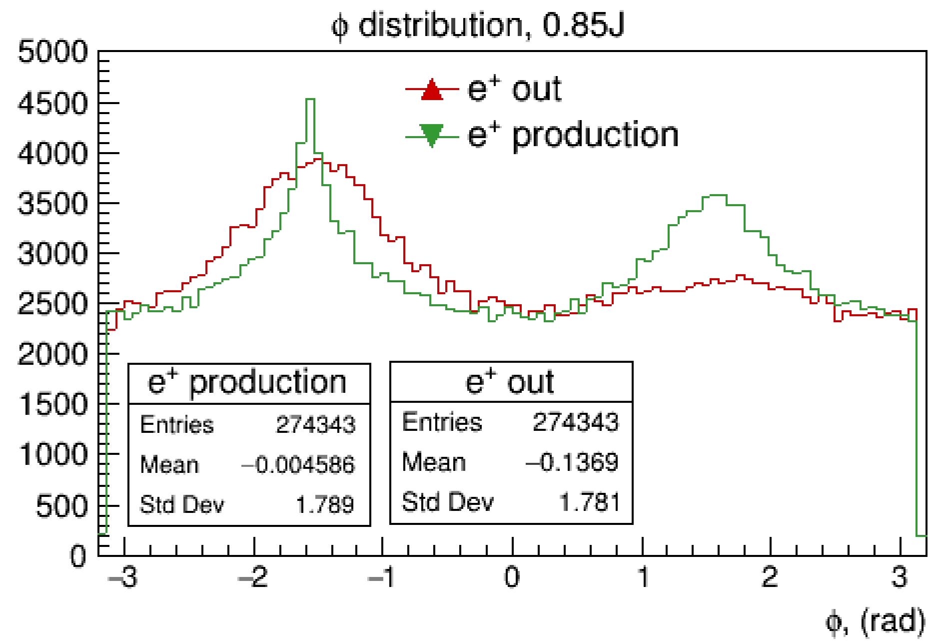
To check permissions in a directory: fs listacl <path_to_directory>

e- e+ azimuthal angle distribution

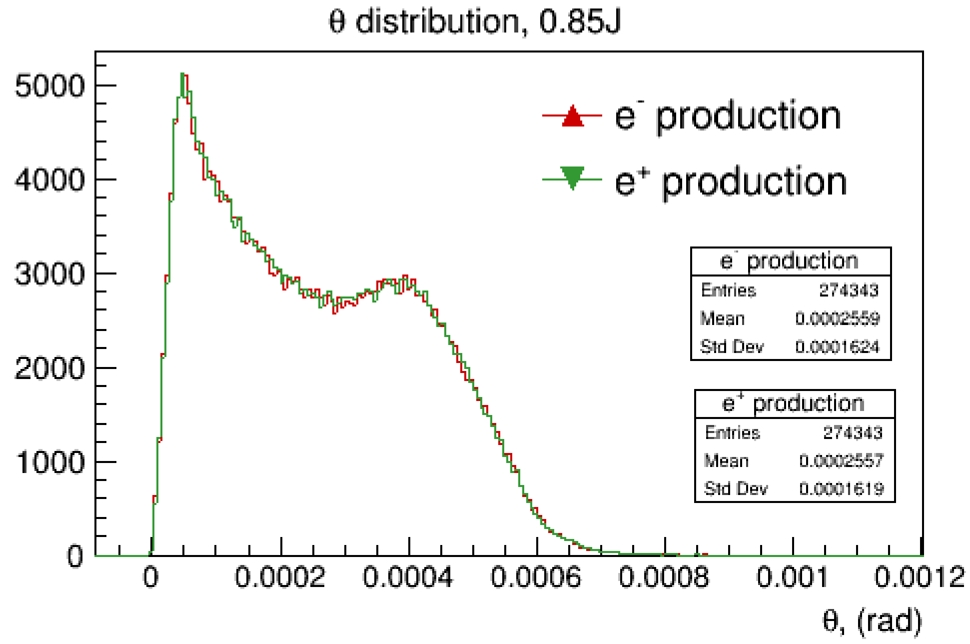


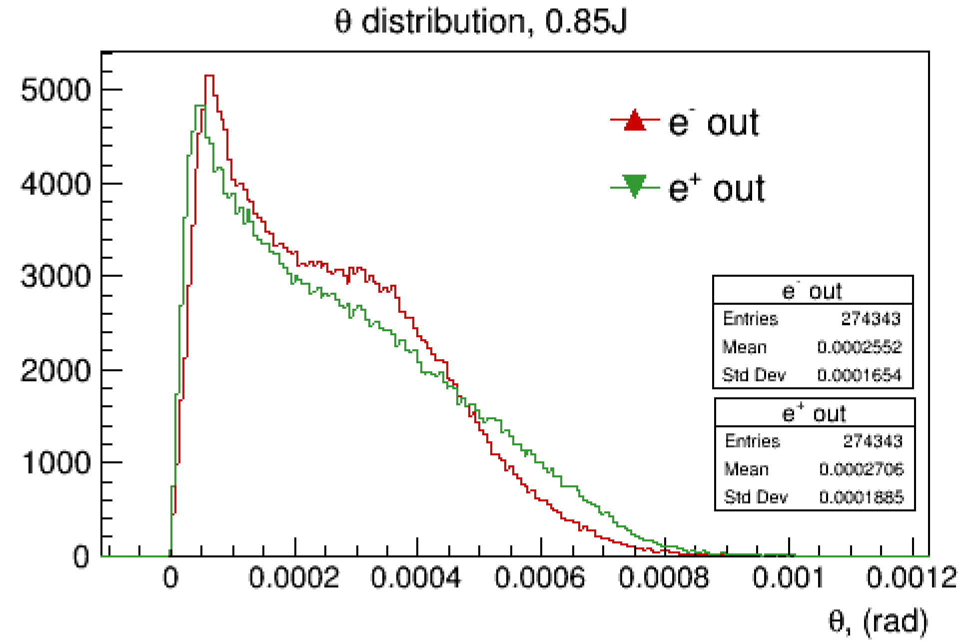




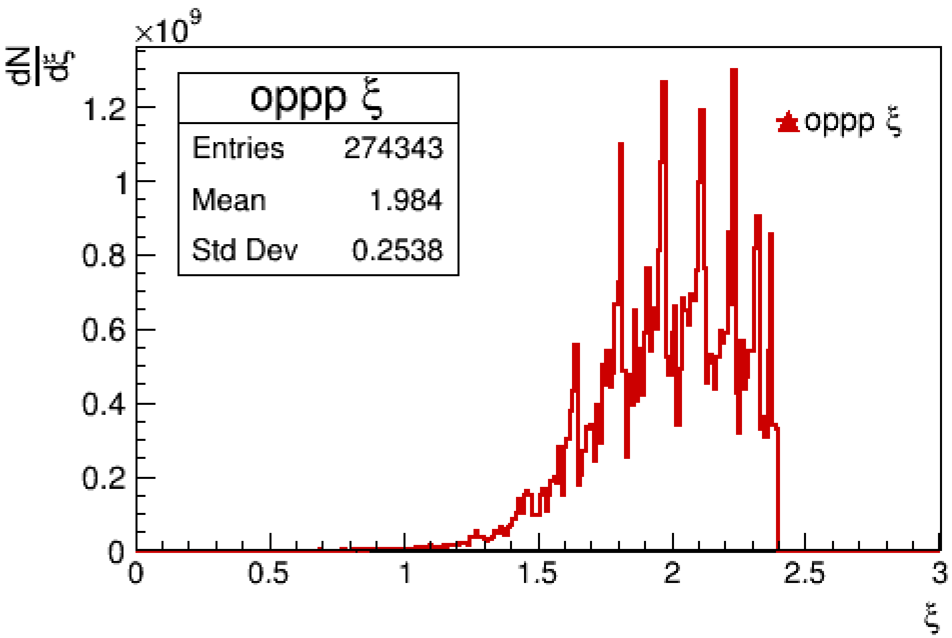


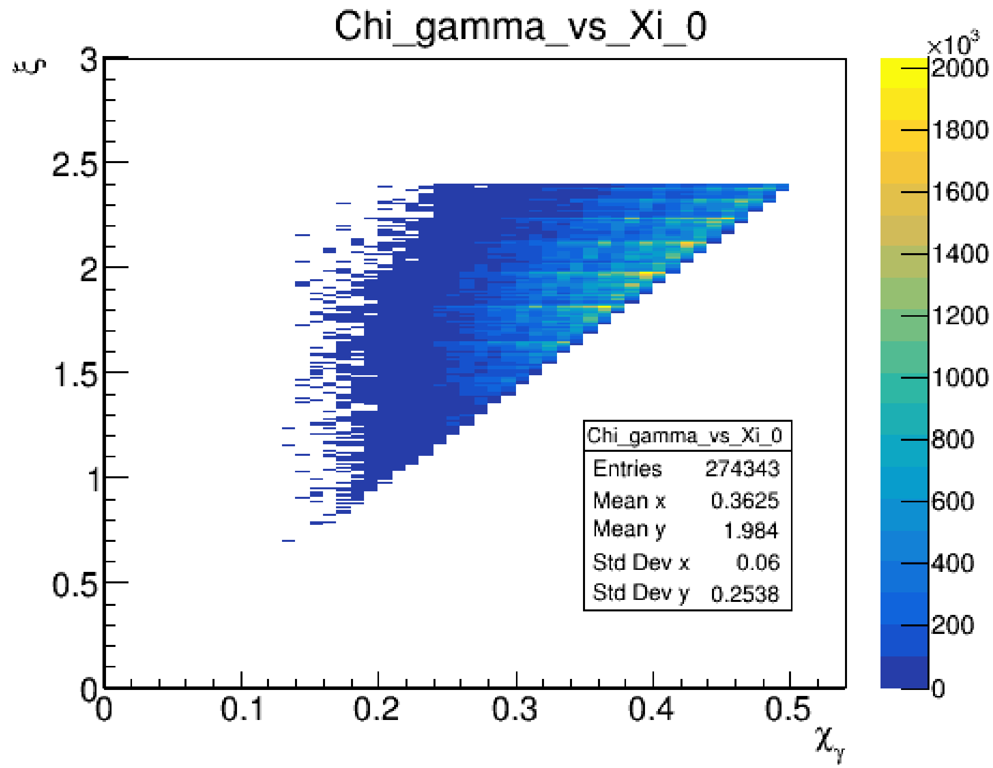
e- e+ polar angle distribution





OPPP for different ξ and χ_γ





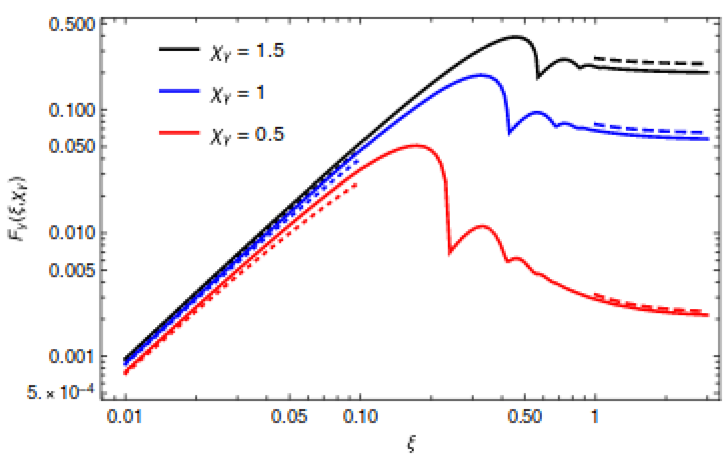
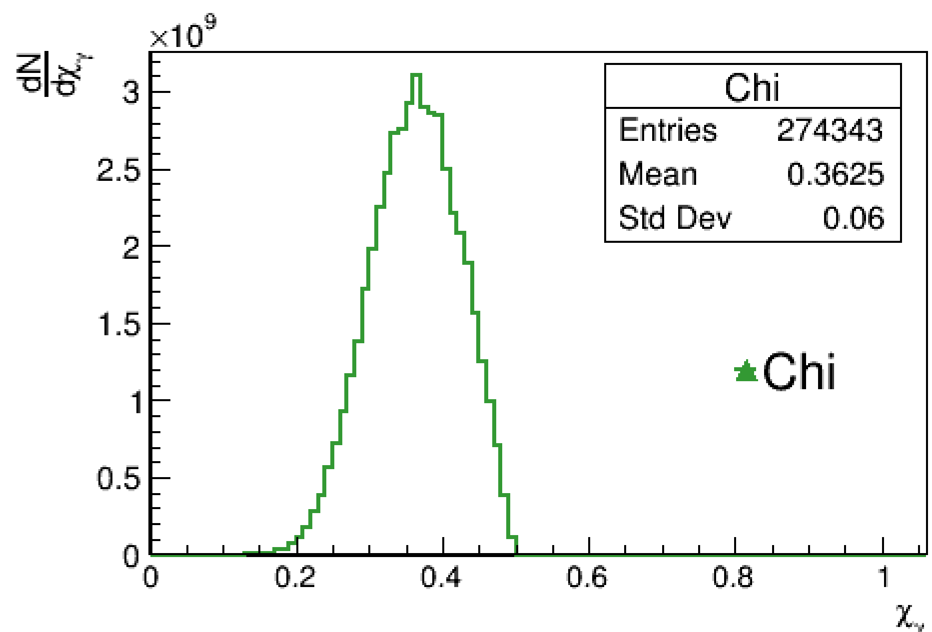


FIG. 2. The dimensionless function $F_\gamma(\xi, \chi_\gamma)$, Eq. (6), describing the probability of laser-assisted OPPP, as a function of the laser intensity parameter ξ, for different values of the photon recoil parameter χ_γ (solid lines). The dotted (dashed) line shows the analytic result valid at small (large) values of the intensity parameter, Eq. (8) [Eq. (9)].



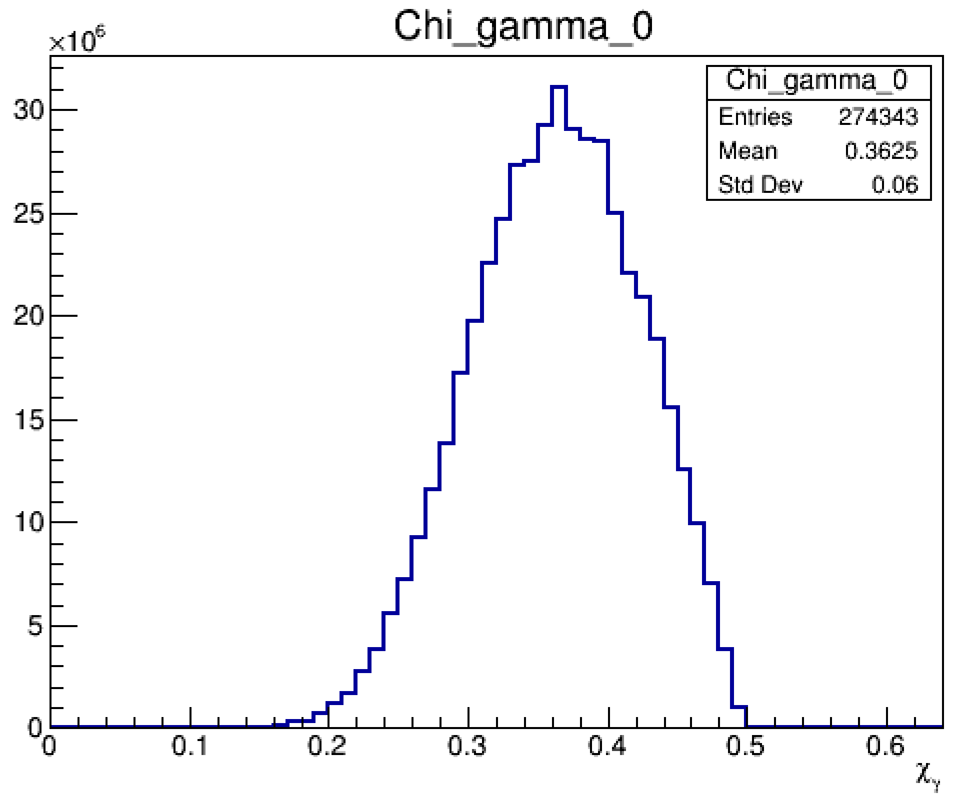
χ_γ

$$\xi \equiv \frac{e|\mathbf{E}|}{\omega m_e} = \frac{m_e}{\omega}\frac{|\mathbf{E}|}{\mathrm{E}_c}, \quad \chi_\gamma \equiv \frac{k \cdot k_i}{m_e^2}\xi = (1+\cos\theta)\frac{\omega_i}{m_e}\frac{|\mathbf{E}|}{\mathrm{E}_c}, \qquad (5)$$

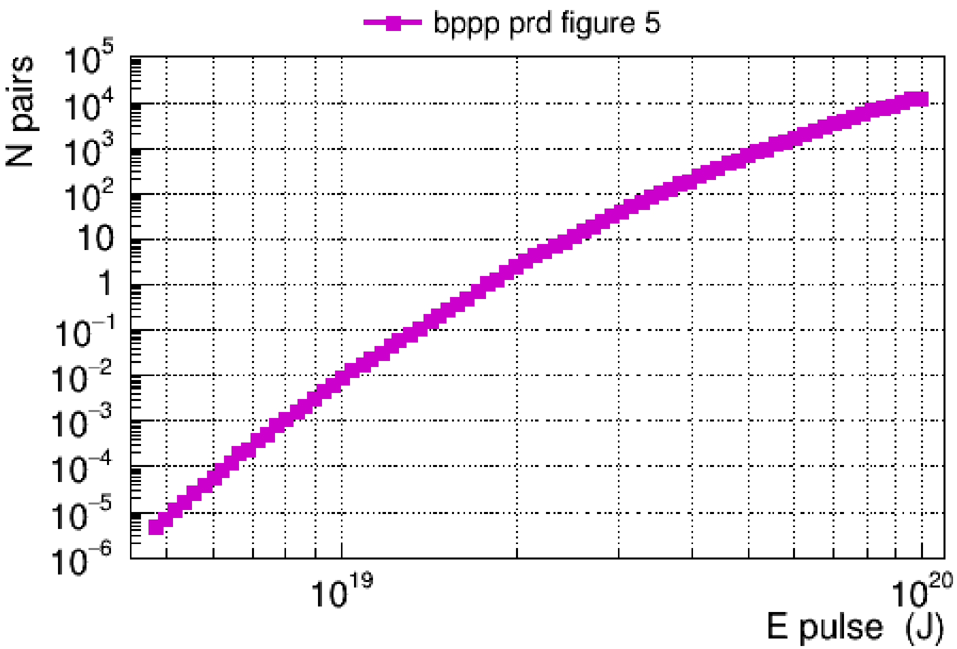
$$\chi_\gamma = (1+\cos(\theta))\frac{\omega\,\omega_i}{m_e^2}\,\xi$$

- $\cos(\theta) \sim 1$;
- $\omega \sim 1.5$ eV;
- $\omega_i < 17.5$ GeV;
- $m_e \sim 0.5$ MeV;
- $\xi < 2.4$.

$$\chi_\gamma < (1+1)\frac{17.5 * 1.5\text{e-}9}{0.5\text{e-}3^2}\,2.4 \approx 0.48$$



Comparison with the paper



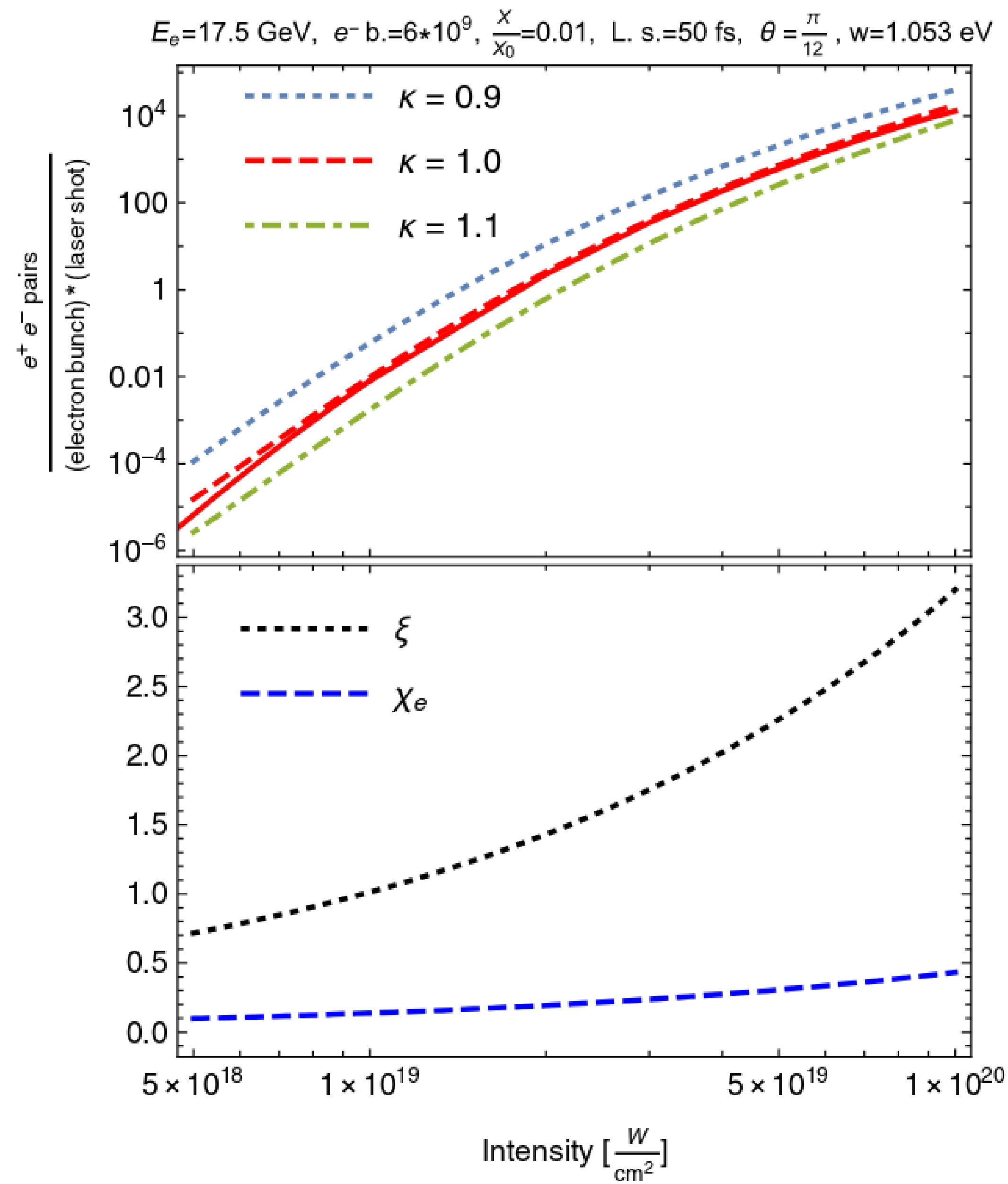
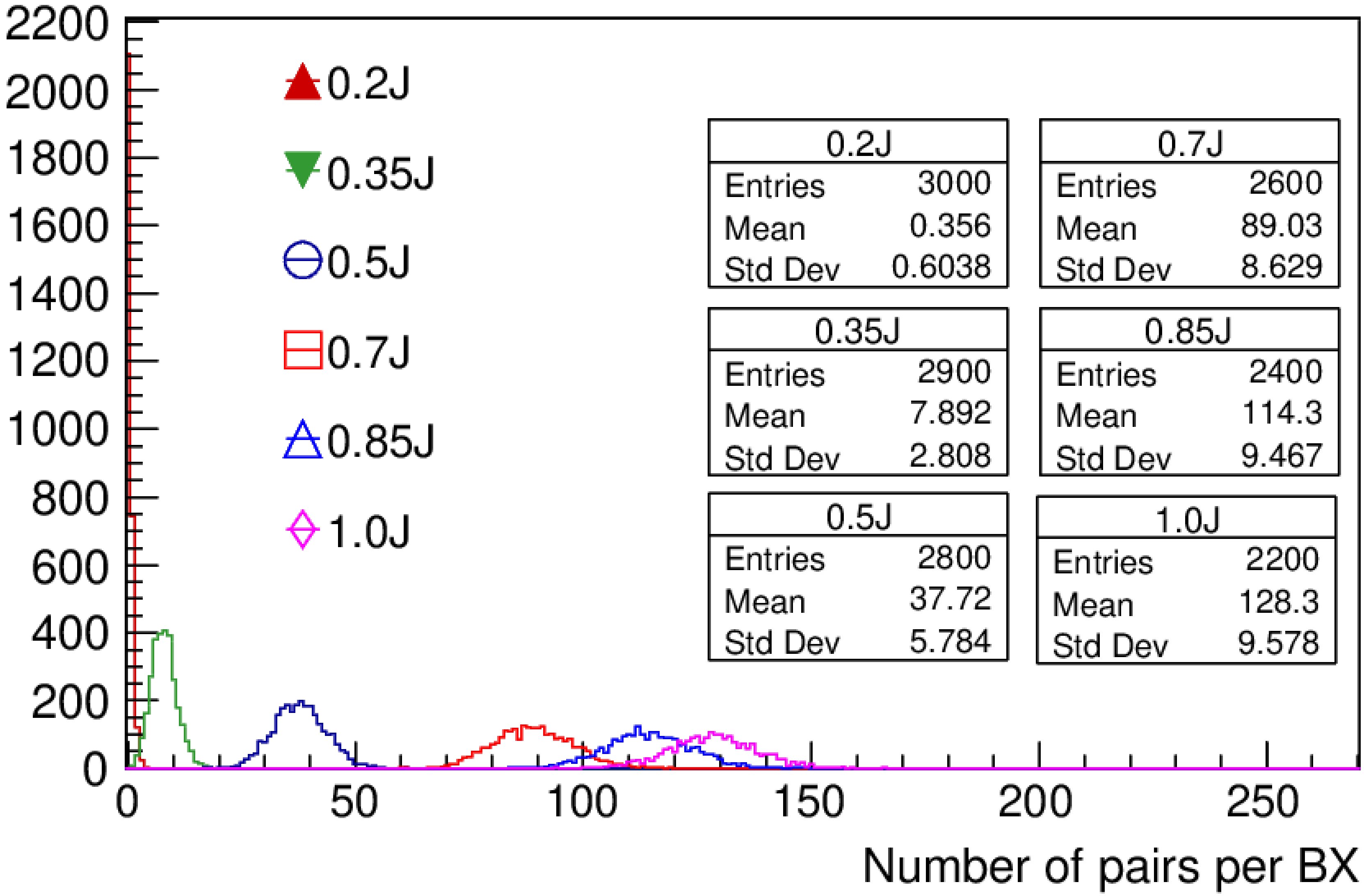
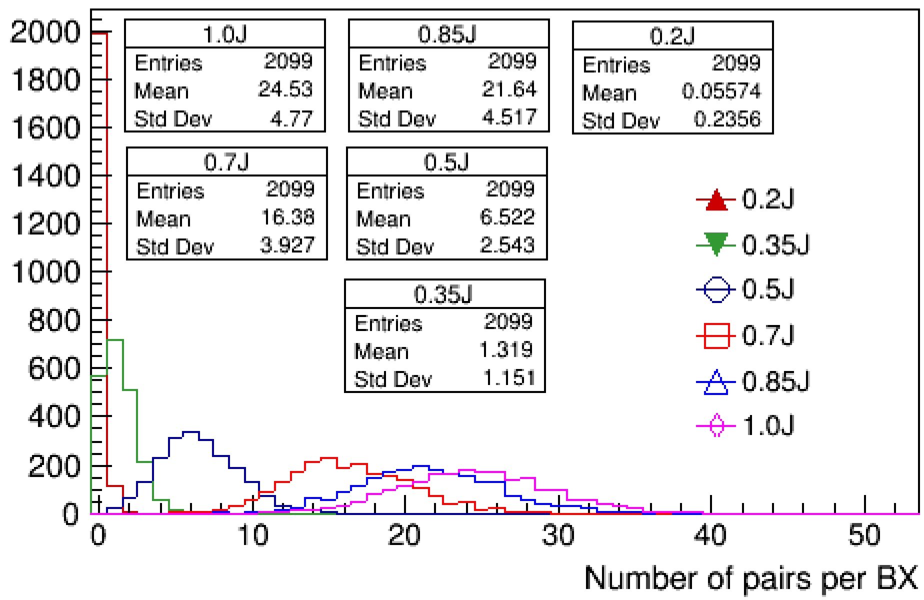


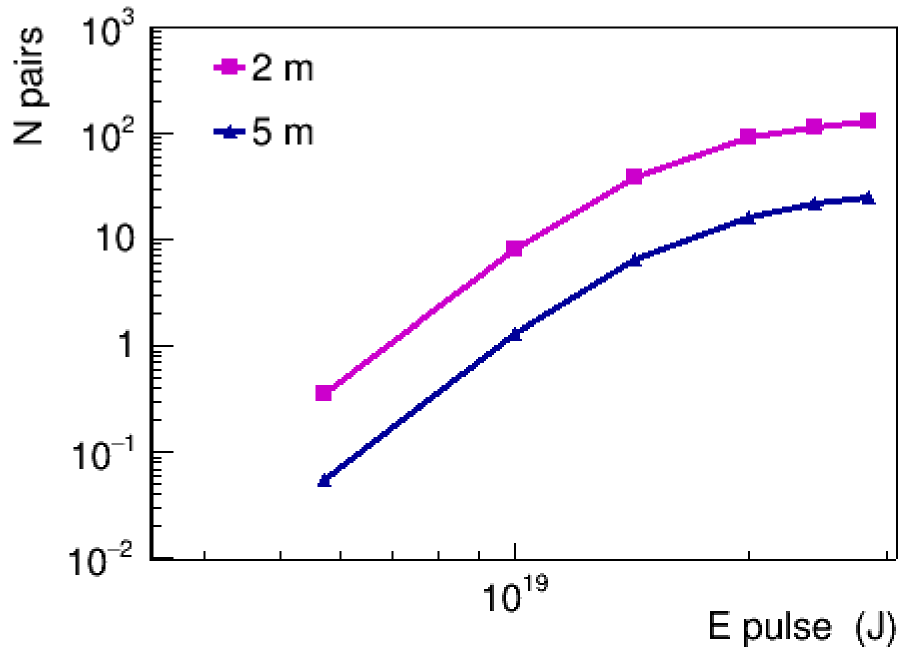
FIG. 5. *Top panel:* Total number of e^+e^- pairs produced per electron bunch (6×10^9 electrons of energy $E_e = 17.5$ GeV) impinging on the bremsstrahlung target (thickness $X/X_0 = 0.01$) and per laser shot (duration 35 fs, laser frequency $\omega = 1.053$ eV) crossed with the bremsstrahlung photons at an angle of $\theta = \pi/12$, as a function of the laser intensity. The dashed line shows the analytic prediction resulting from (14), exploiting the relations (11) and (16). The dotted (dot-dashed) line shows the same analytic prediction, but for the case where the value of the Schwinger critical field E_c deviates by a multiplicative factor of $\kappa = 0.9$ ($\kappa = 1.1$) from its nominal value (2). *Bottom panel:* The laser intensity parameter ξ (dotted) and the electron recoil parameter (dashed), as a function of the intensity, cf. Eqs. (11) and (16).

Number of pairs for different laser intensity, target 2 m upstream of IP



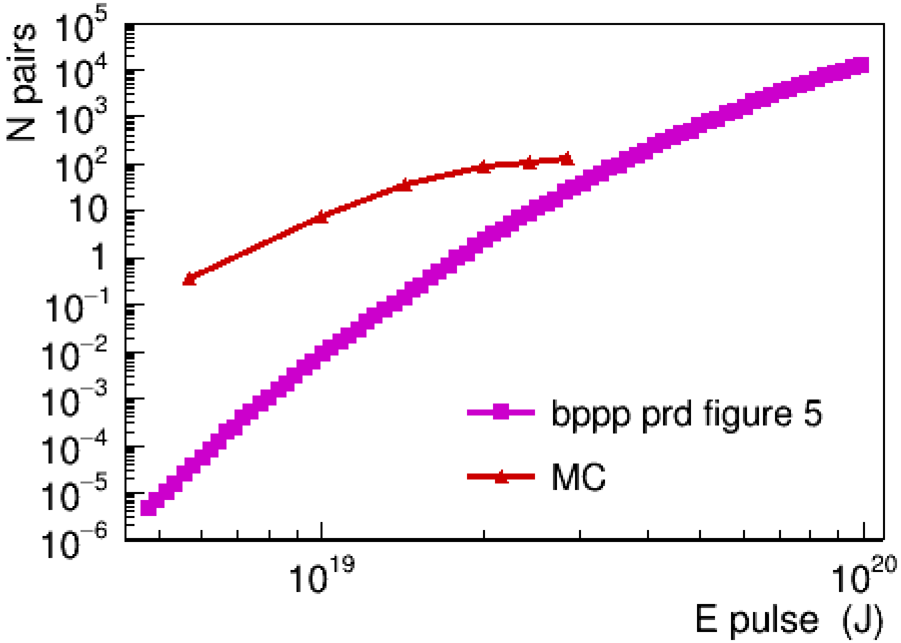
Tungsten target 5 m upstream of IP

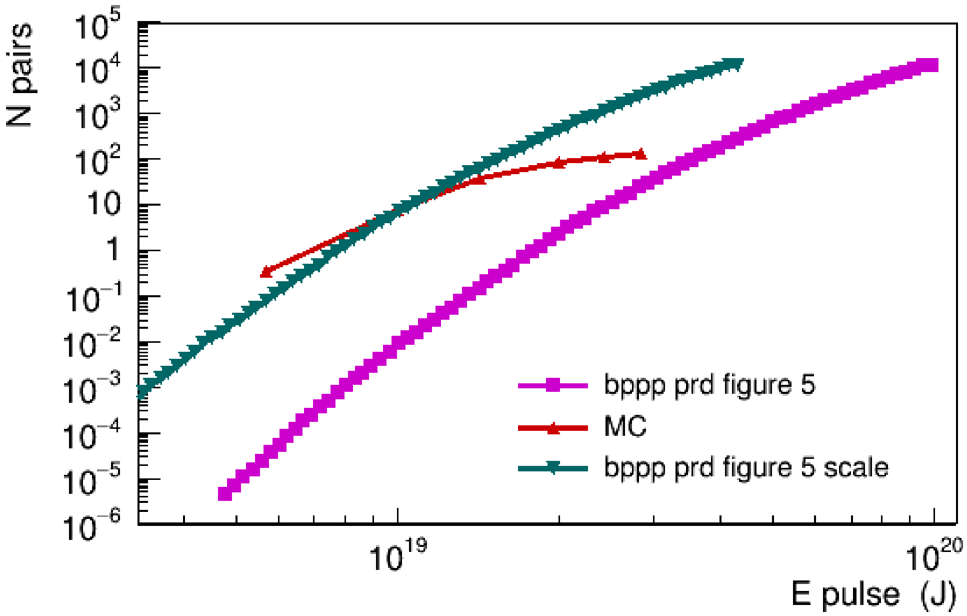




xi	I (W/cm2)	N pairs 2m	N pairs 5m	N2/N5
0.37	5.71E+018	0.356	0.0557408	6.39
0.49	1E+019	7.89241	1.31872	5.98
0.58	1.429E+019	37.7175	6.52168	5.78
0.69	2E+019	89.0315	16.3754	5.44
0.76	2.429E+019	114.31	21.6355	5.28
0.82	2.857E+019	128.306	24.5345	5.23

Scale intensity

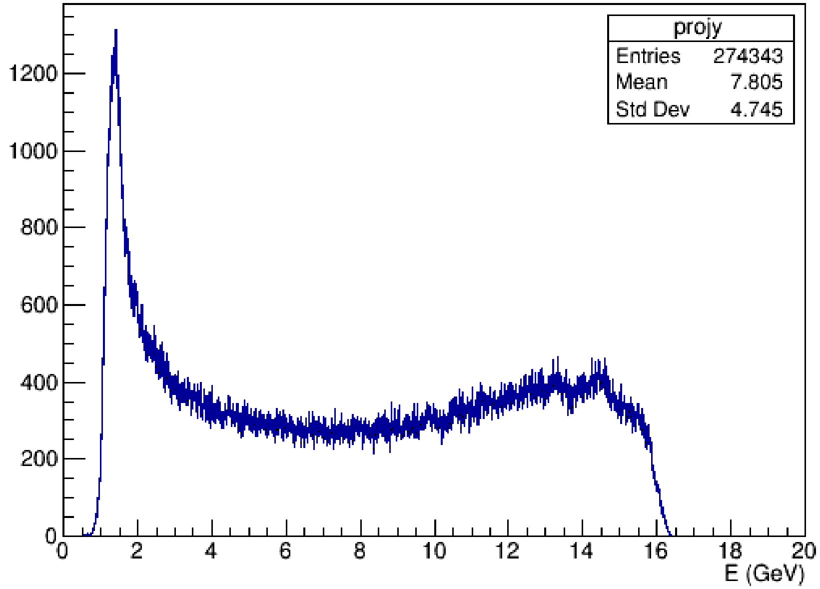


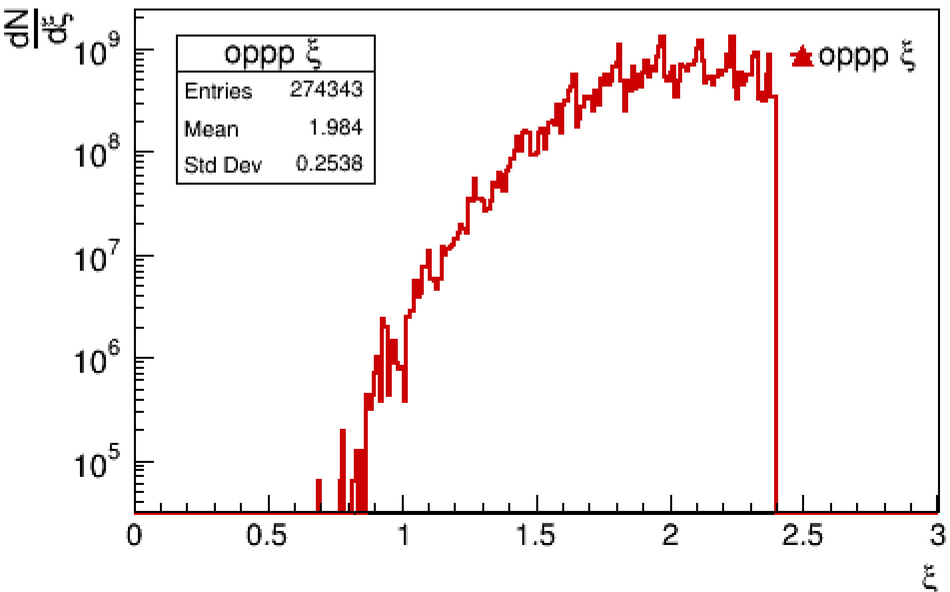


$$\xi = 3.2 \left(\frac{I}{10^{20}\,\mathrm{W/cm^2}} \right)^{1/2} \left(\frac{1.053\,\mathrm{eV}}{\omega} \right), \qquad (11)$$

$$I = 10^{20} \left(\frac{\xi}{3.2} \frac{\omega}{1.053} \right)^2 \quad \Rightarrow \quad \frac{I_1}{I_2} = \left(\frac{7.163}{3.2} \frac{\omega_1}{\omega_2} \right)^2 = \left(\frac{7.163}{3.2} \frac{1.053}{1.5498} \right)^2 = 2.313105$$

Spectra e-

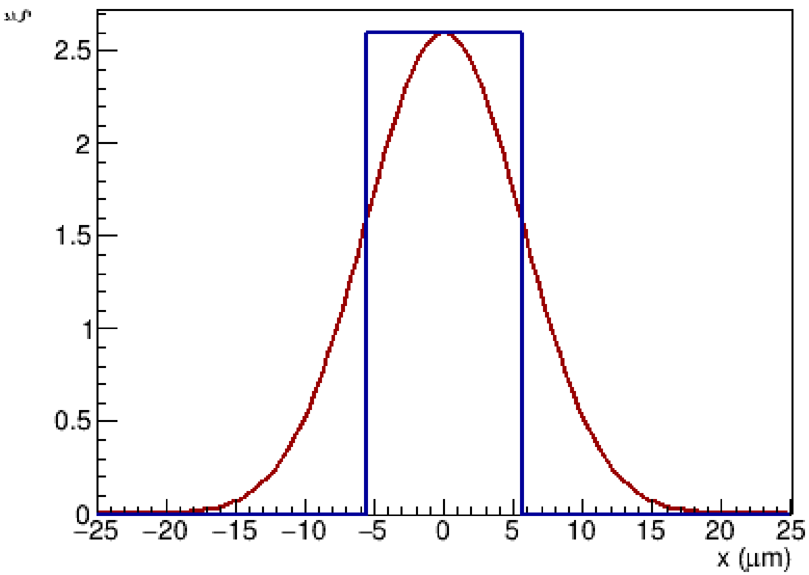

projy
Entries 274343
Mean 7.805
Std Dev 4.745
E (GeV)


oppp ξ
Entries 274343
Mean 1.984
Std Dev 0.2538
oppp ξ
dN/dξ
ξ

Normalization of $N_p(\xi)$

$$N_\gamma(\xi) = \int n_\gamma(\mathbf{r}, s)\, \delta(\xi - \xi(\mathbf{r}, s))\, dVds$$

$$n_\gamma(x, y, z, s) = n_0 \exp\left(-\frac{(z-s)^2}{2\sigma_z^2} \right)$$



Two cases for $\xi(x, y, z, s)$:

1 $$\xi(x, y, z, s) = I_0 \exp\left(-\frac{x^2+y^2}{2\sigma_{xy}^2} \frac{(z+s)^2}{2\sigma_z^2} \right)$$

2 $$\xi(x, y, z, s) = I_0 \exp\left(-\frac{(z+s)^2}{2\sigma_z^2} \right)$$ If $x^2+y^2<R^2$, and 0 otherwise

OPPP for different normalization