07.10 Jingyu

- Docu
- pt func

pt func of Δϕ and η

- Akiba's suggest:

```
dphi=0.2/pT  at  eta=0
Dphi=c(¥eta)/pT    c(¥eta)  = 0.2 at ¥eta=0
                   c(¥eta)= 0.19?  ¥eta=0.5
                   c(¥eta) =  0.2 + c1*¥eta + c2*¥eta^2
```

- Assume on func to calculate pt, Δϕ and η are separable,

  F(Δϕ,η) = C(η)*f(Δϕ), and f(Δϕ) = 1/Δϕ.

Then I want to get the C(η) from

- **C(η) = ⟨pT·Δϕ⟩**
- C_value = pT·Δϕ for each electron

$$f(x) = p_0 + p_1\,x + p_2\,x^2 + p_3\,x^3 + p_4\,x^4$$

- Fill the C_value on a TProfile, and fit the TProfile with poly 4.

pT·Δϕ - η distribution

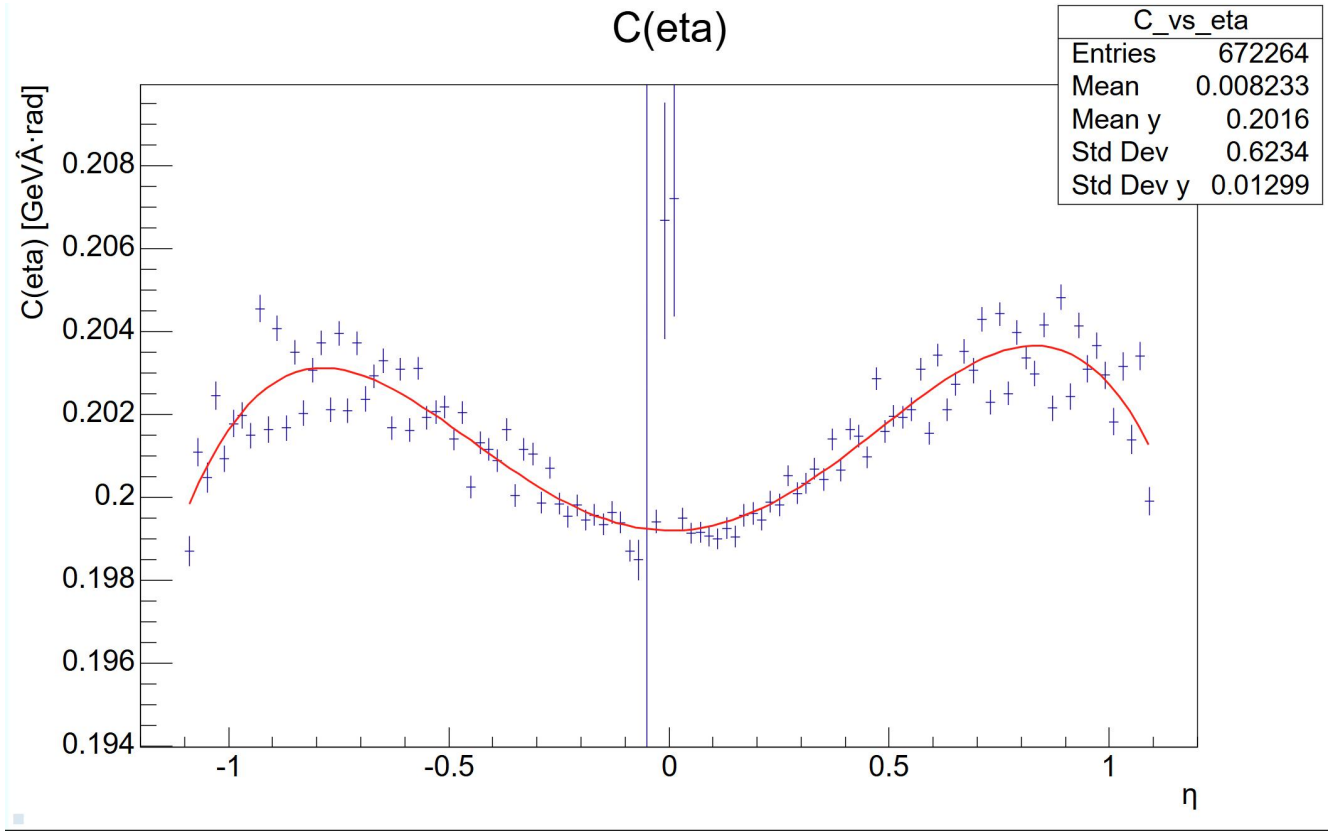
- loop the simulation data, for each electron
  - Get the **truth pT**, Get the primary particle eta **η**
  - Get the **Δϕ** from iINTT, oINTT and Primary particle first hit on CEMC position
  - calculate the **C_value = pT·Δϕ**
  - skip the very large and smale C_value, **if (Cval > 0.3 || Cval < 0.15) continue**
  - Fill a TProfile with η and pT·Δϕ**, TProfile *tpr1->Fill(eta, C_value)**
  - Fill a TGraph with η and pT·Δϕ points

$$f(x) = p_0 + p_1\,x + p_2\,x^2 + p_3\,x^3 + p_4\,x^4$$

- Fit the TProfile with Poly4 func (5para. x^0-x^4)
  - loop xbins, if(profC->GetBinContent(ib) > 0.205) profC->SetBinError(ibin, 2e-1)
    adjust the error on odd bin, Minimize its impact on the fit.

- Fit the TGraph with Poly4 func (5para. x^0-x^4)
  - Advantage is that the fit is performed directly on the data points, without any binning.

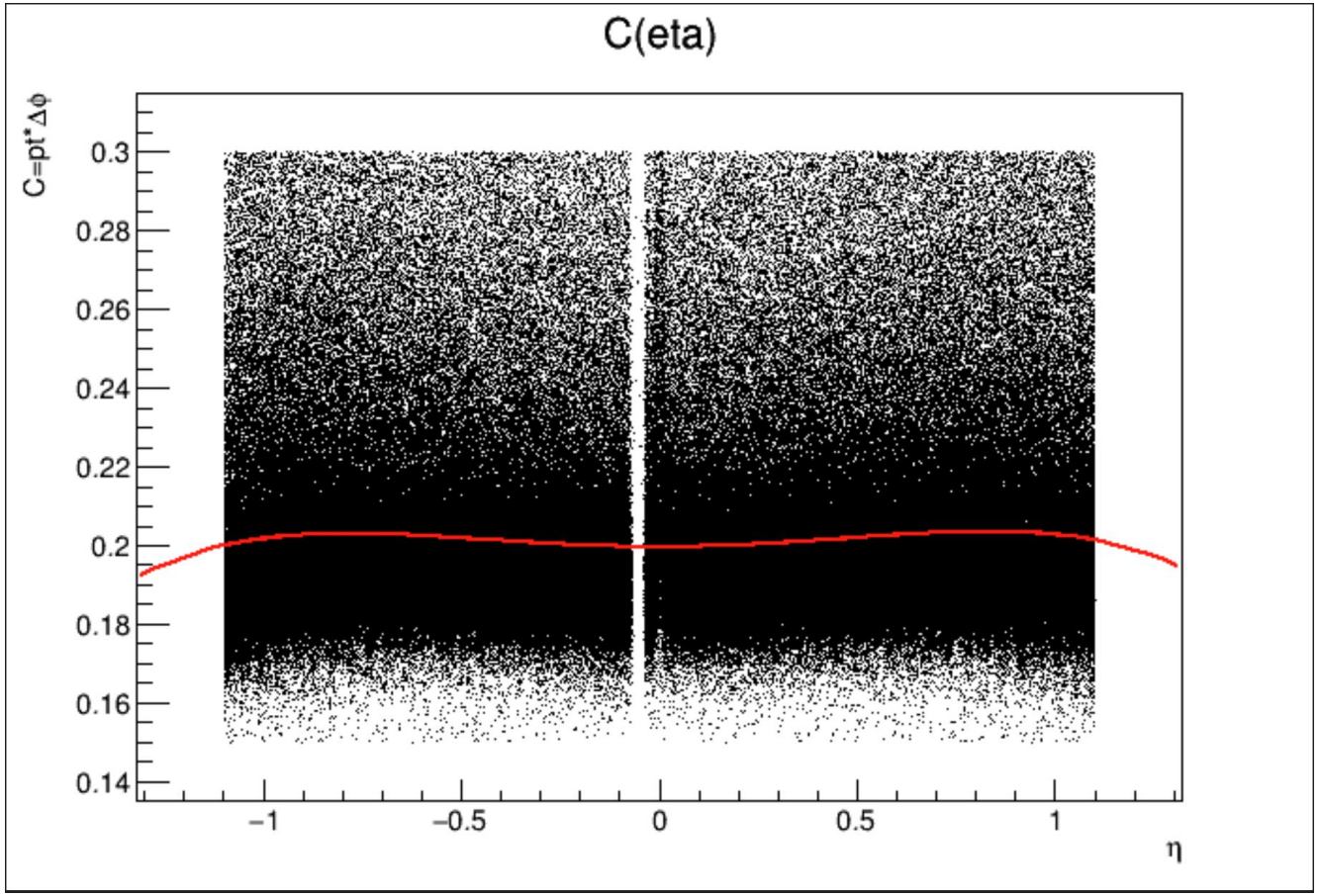
fit func on TProfile



NO.	NAME	VALUE	ERROR
1	p0	1.99198e-01	5.07218e-05
2	p1	-6.38608e-05	1.06560e-04
3	p2	1.28447e-02	2.75958e-04
4	p3	6.06315e-04	1.43027e-04
5	p4	-9.86226e-03	2.63624e-04

$$f(x) = p_0 + p_1\,x + p_2\,x^2 + p_3\,x^3 + p_4\,x^4$$

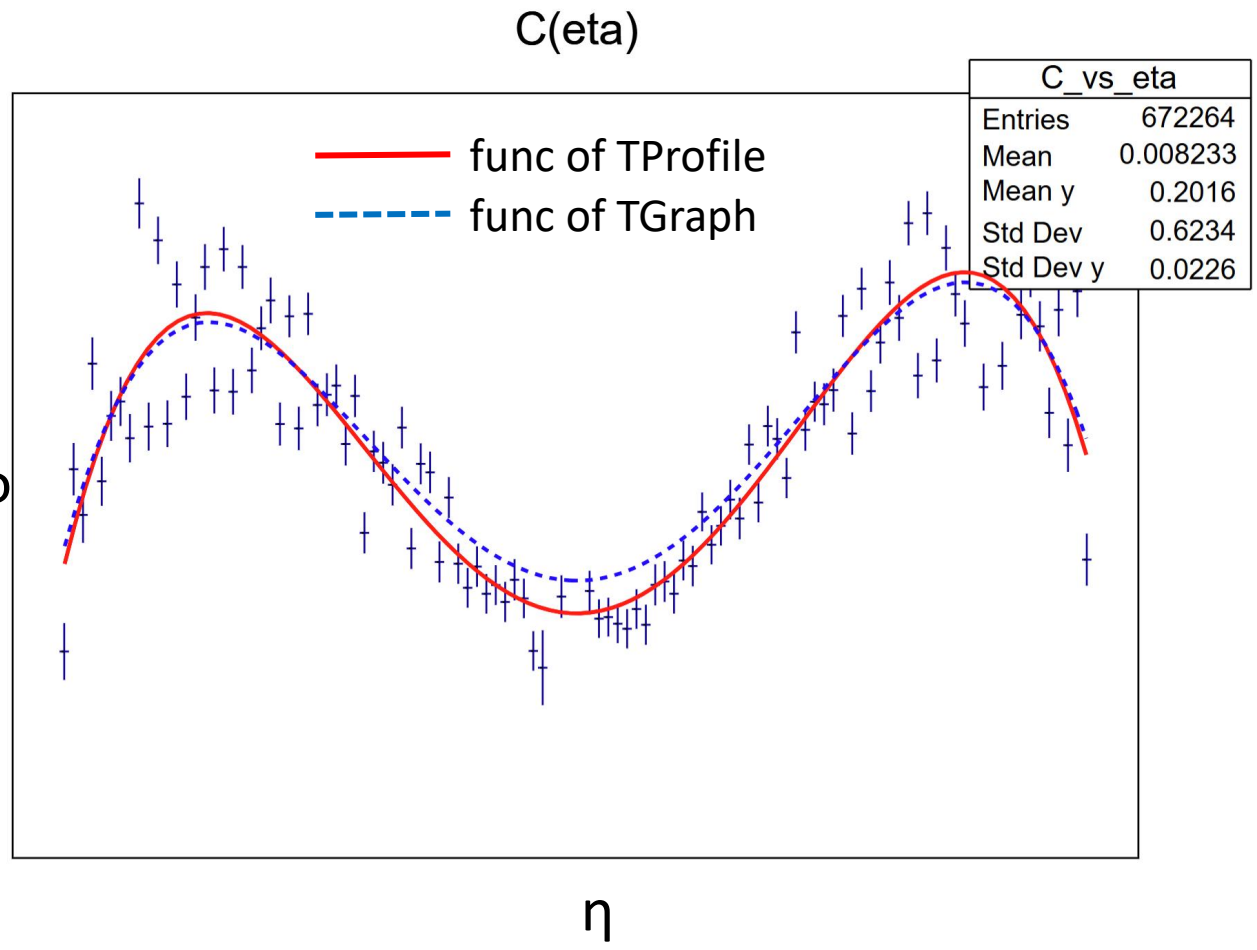
fit func on TProfile



p0	=	0.199626	+/-	5.178e-05
p1	=	-6.95944e-05	+/-	0.000107422
p2	=	0.0111714	+/-	0.00027129
p3	=	0.000603954	+/-	0.000139037
p4	=	-0.00859856	+/-	0.000253666

$$f(x) = p_0 + p_1\,x + p_2\,x^2 + p_3\,x^3 + p_4\,x^4$$

Compare the func.s



$C = pT \cdot \Delta\phi$

func of TGraph compare with func ofTProfile without Give a large error on odd bin, Conside the odd point -> ~0 η range, unc of TGraph larger than unc of TGraph

Thanks