Gain Vs Hadron Rejection Factor

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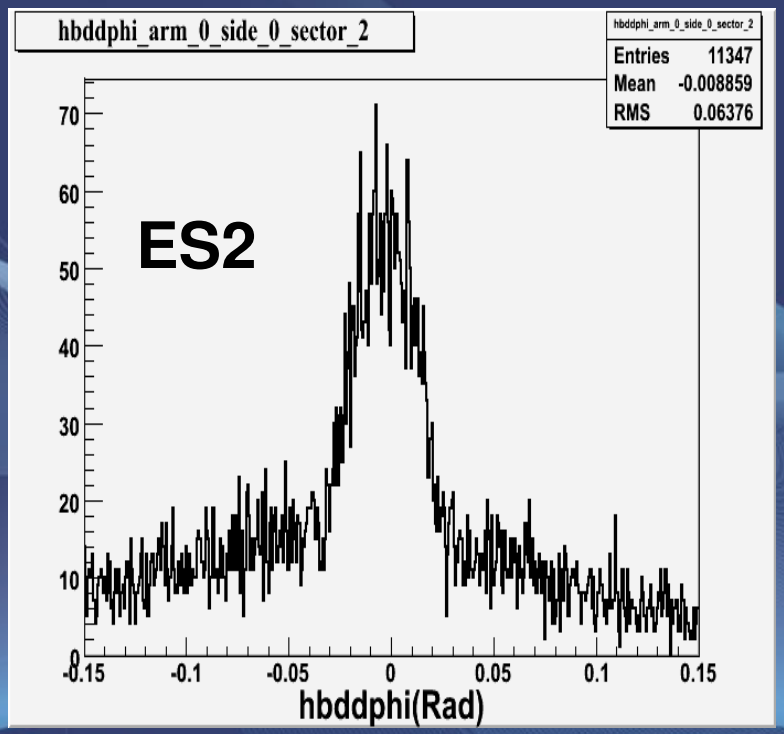
DATA & CUTS

- RUN # 286032
- 200 GeV (+ -) Magnetic field
- n0<0(for Hadrons Tracks)
- HBD is in Reverse Bias Mode
- Use only High Quality Tracks (which have 31& 63 bit combination)
- Vertex Cut is +-/ 20 cm
- For HBD Matching hbddz<5 cm & hbddphi< 0.04 rad
- Matching Cuts to PC3 and EMC

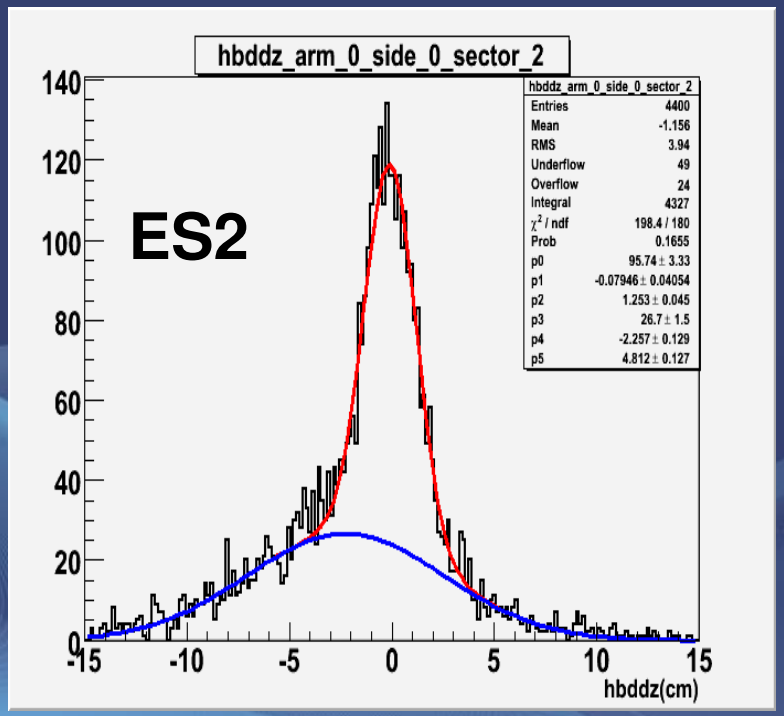
  pc3_dz<8.0 cm , pc3_dphi<0.015 rad, emc_dz<10.0 cm, emc_dphi<0.030 rad

Matching to HBD (hbddϕ and hbddz)

hbddϕ



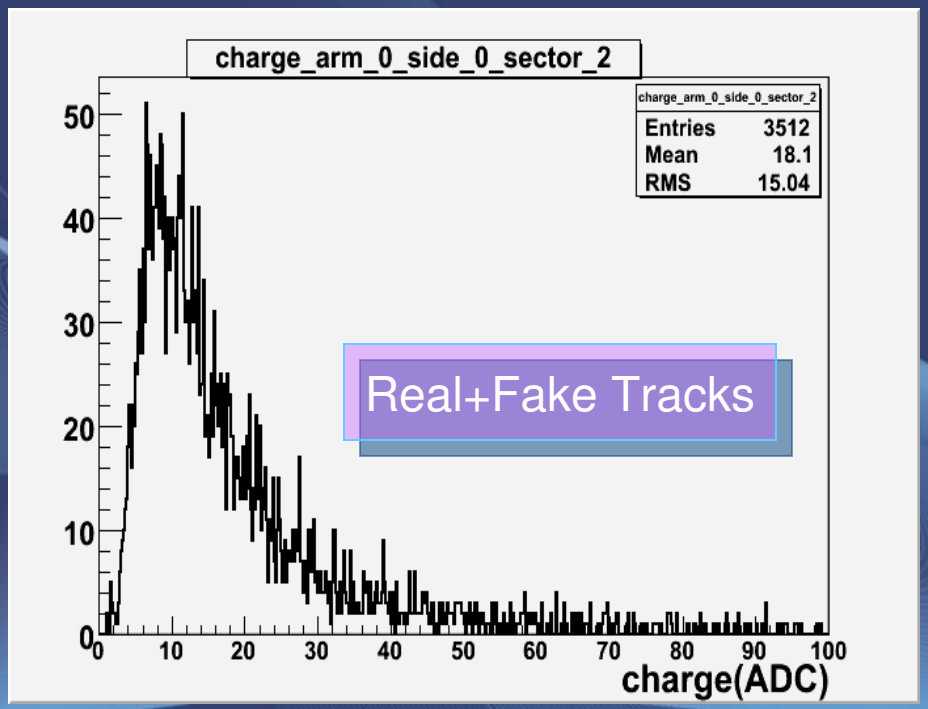
hbddz (|hbddϕ| < 0.04 rad)

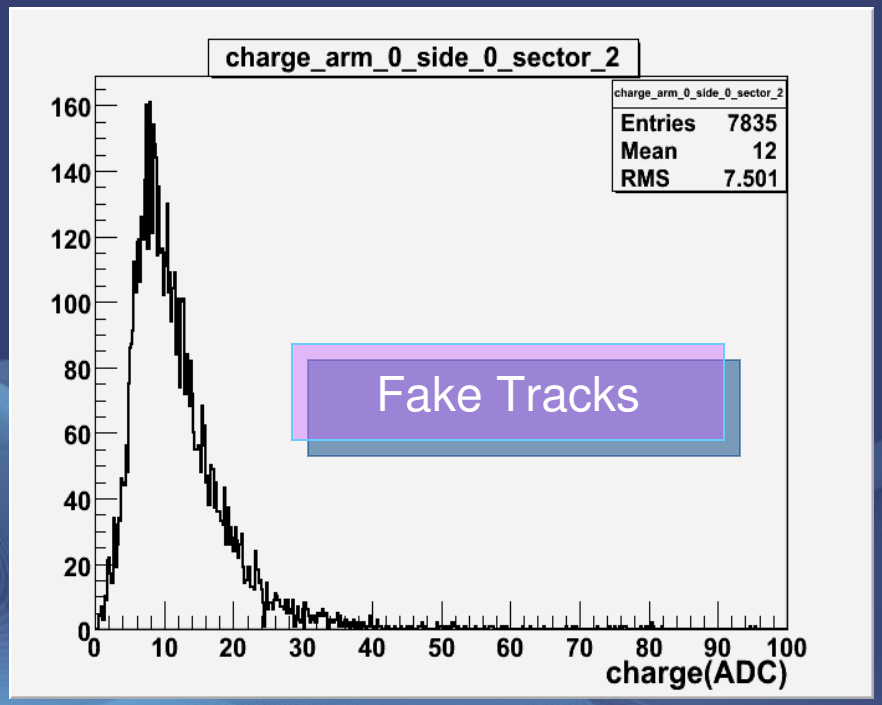


Charge Distribution For ES2, Gain=6.67

hbddz<5 cm
&&
hbddphi<0.04 rad

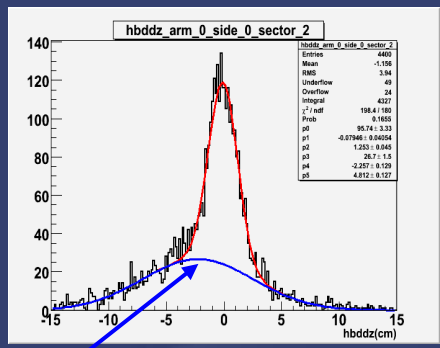
hbddz>5 cm
or
hbddphi>0.04 rad





Normalization of fake tracks

Real+Fake Tracks - Normalized Fake Tracks = True Matched Tracks



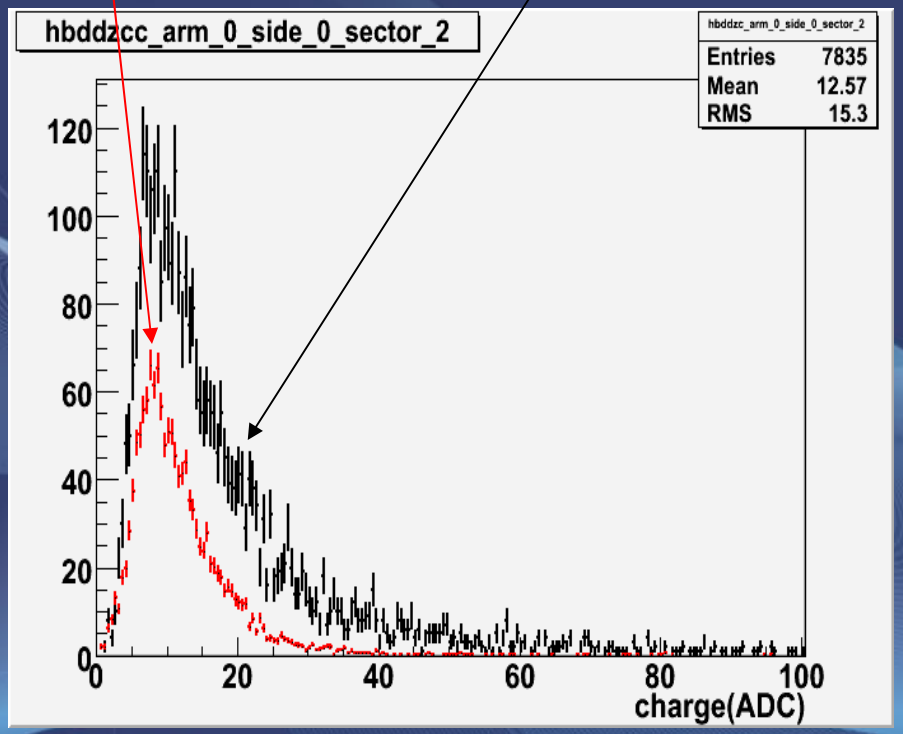
- Fit dz matching distribution with two Gaussian functions.
- Normalize the Fakes by the following factor.

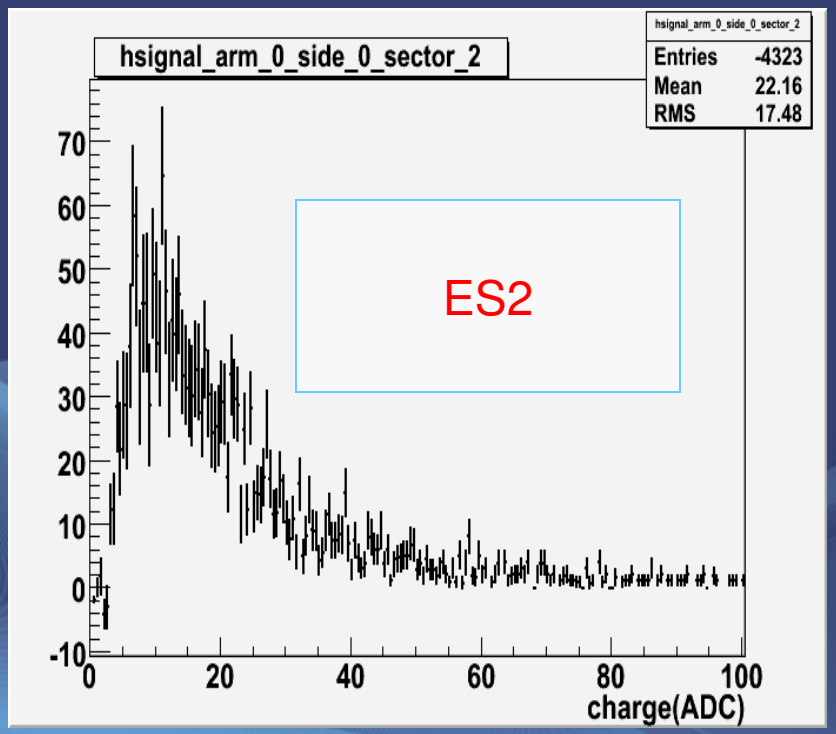
$$\frac{\textbf{Integral of Background function of dz matching}}{\textbf{Total number of fake tracks}}$$

Normalized Fake Tracks Charge Distribution

True+Fake Tracks Charge Distribution

True Matched Tracks (charge distribution After Random background subtraction)





Hadron Rejection Factor

- Do the same procedure for all modules.
- Calculated the Hadron Rejection Factor by two methods -

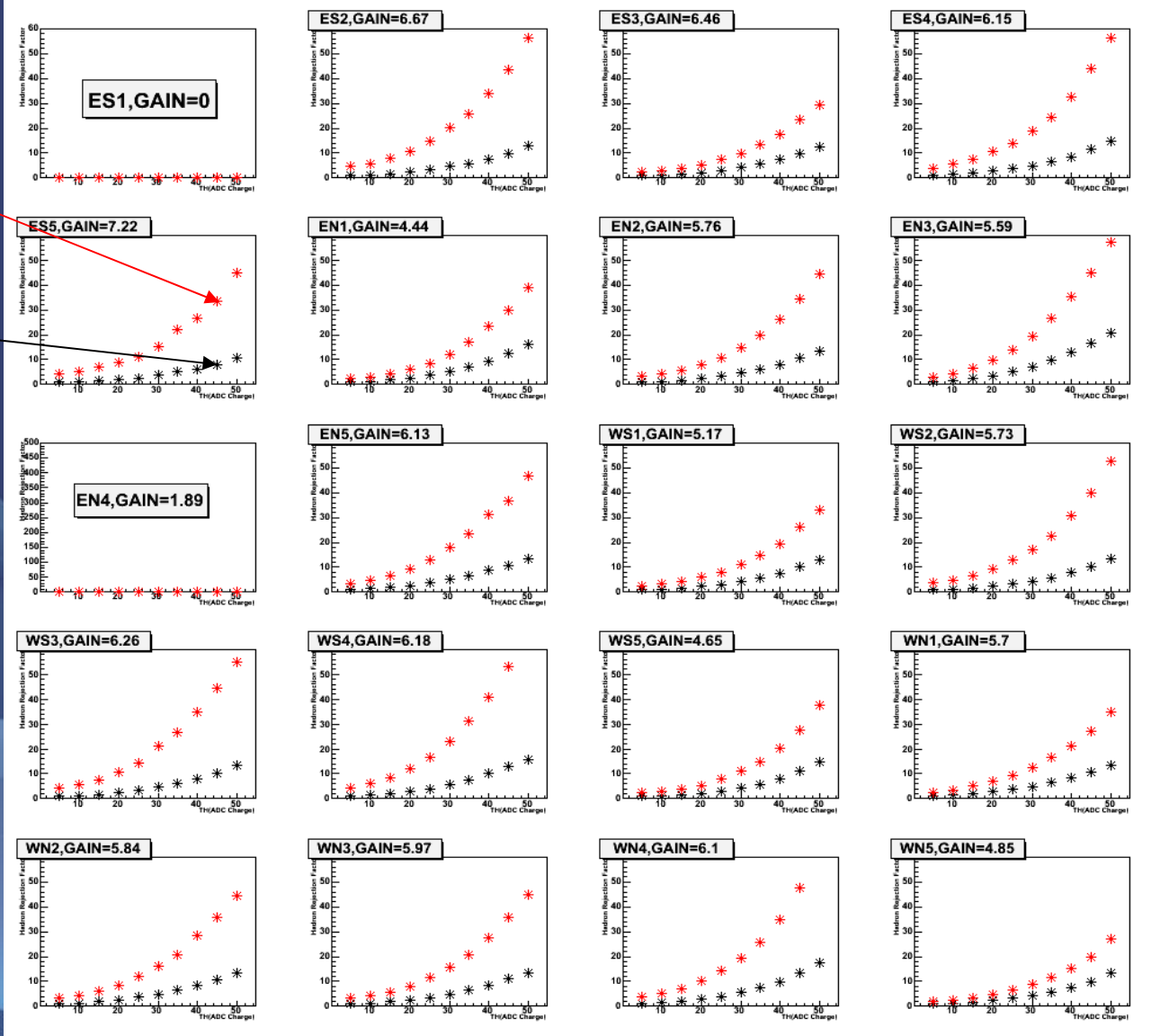
{Lower Limit}

I) $$\frac{\textbf{(Total number of matched hadron tracks)}}{\textbf{(Number of matched tracks after the amplitude cut)}}$$

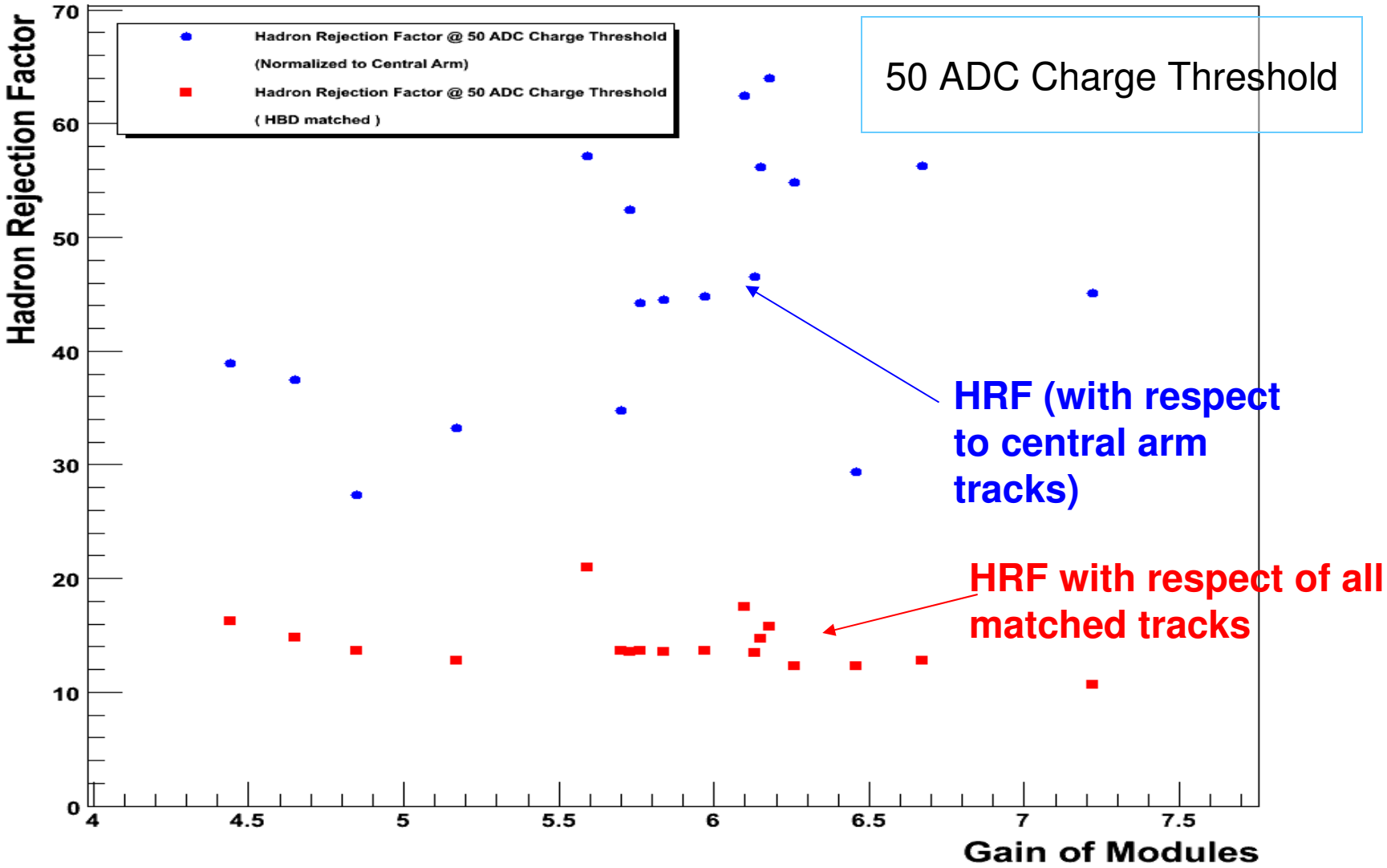
II) $$\frac{\textbf{(Total number of central arm hadron tracks)}}{\textbf{(Number of matched tracks after amplitude cut)}}$$ {Upper Limit}

Hadron Rejection Factor for all Modules working in this RUN

- HRF (normalized to central arm tracks)
- HRF for HBD matched tracks



Hadron Rejection Factor Vs Gain



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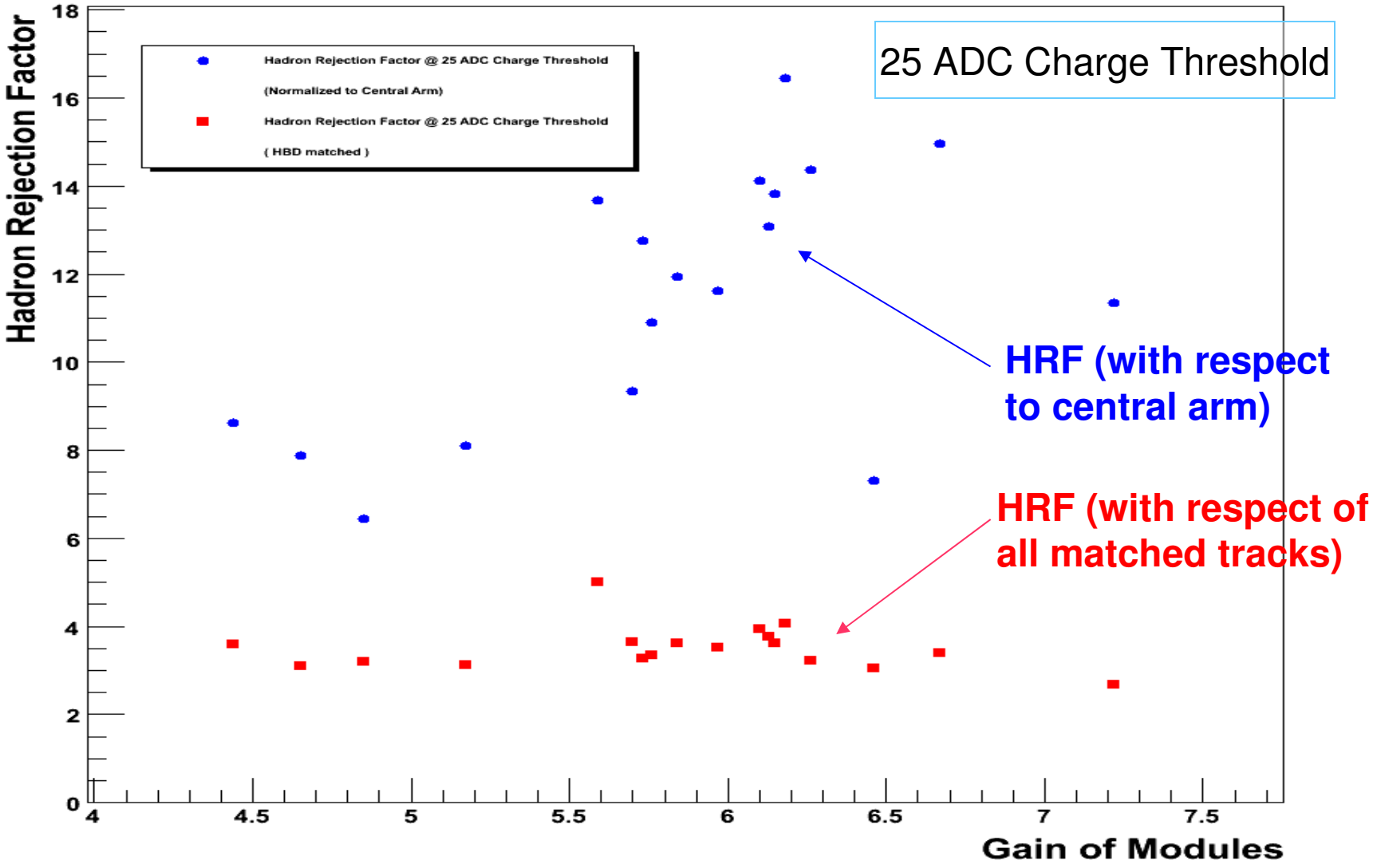
Hadron Rejection Factor Vs Gain



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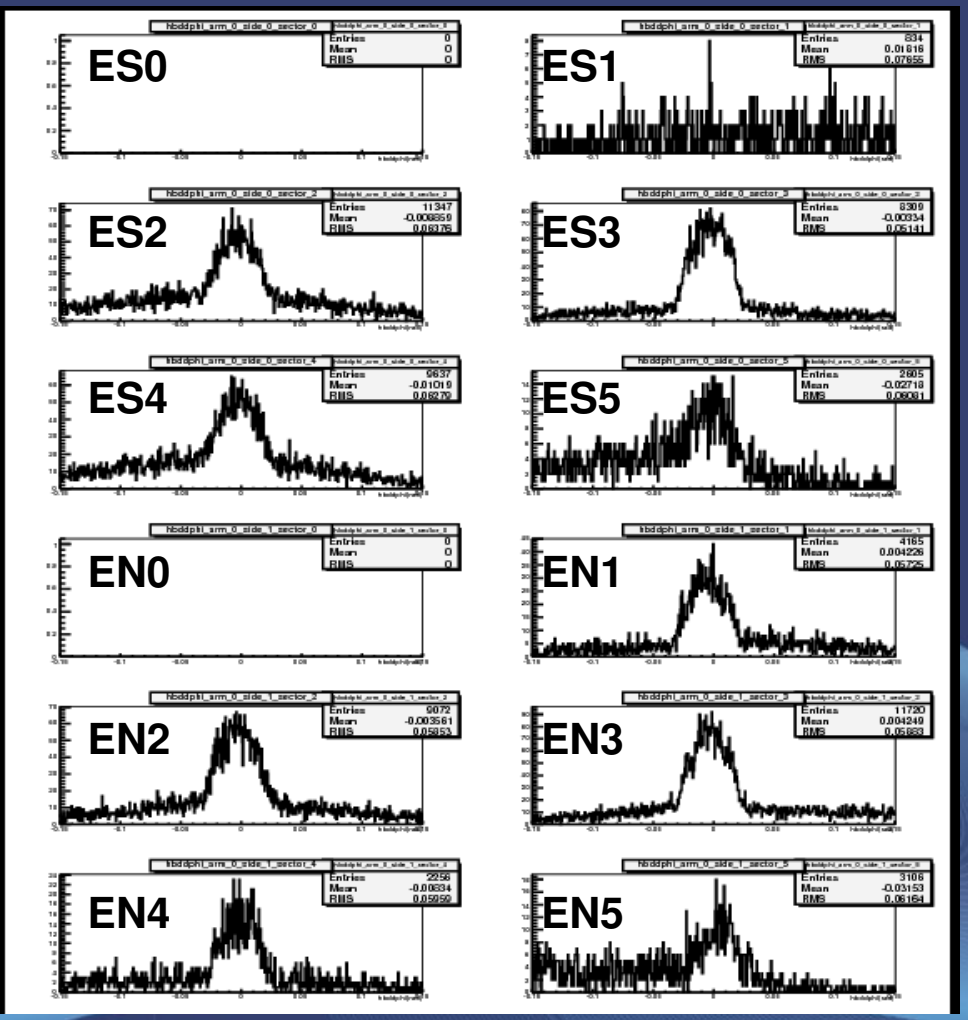
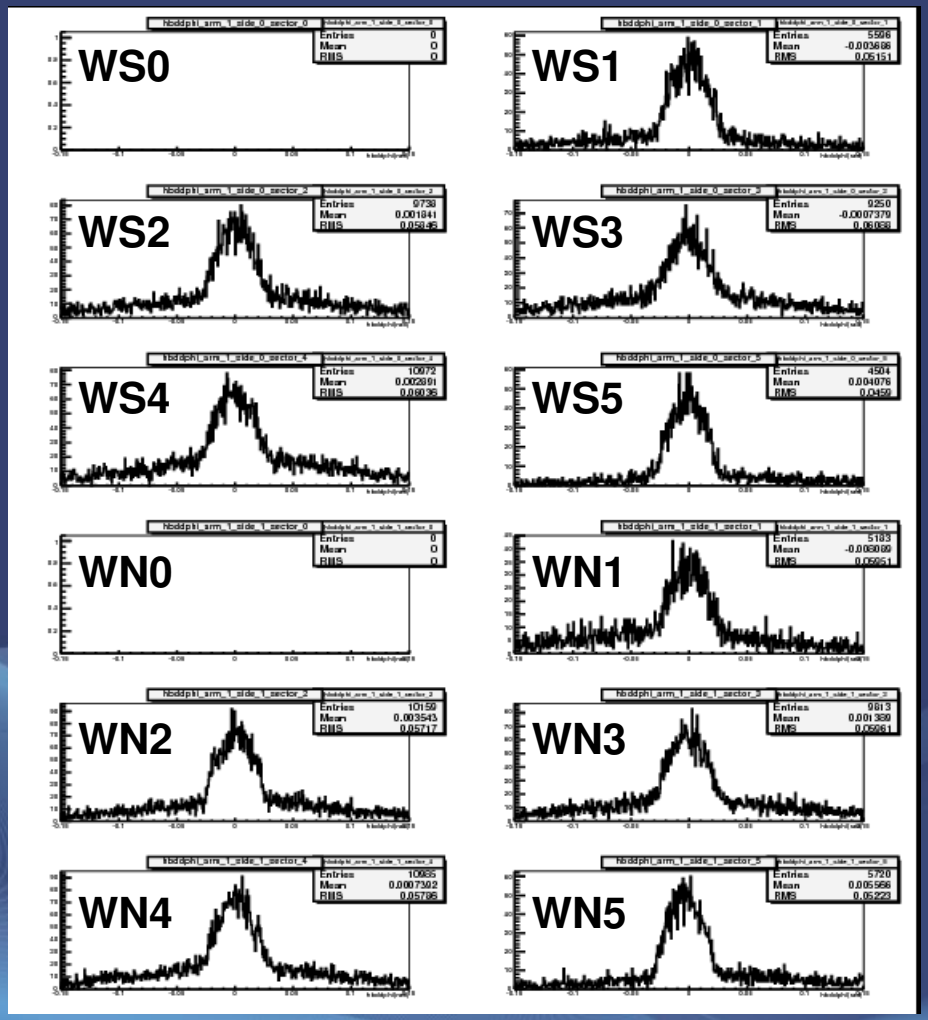
Thank you.....

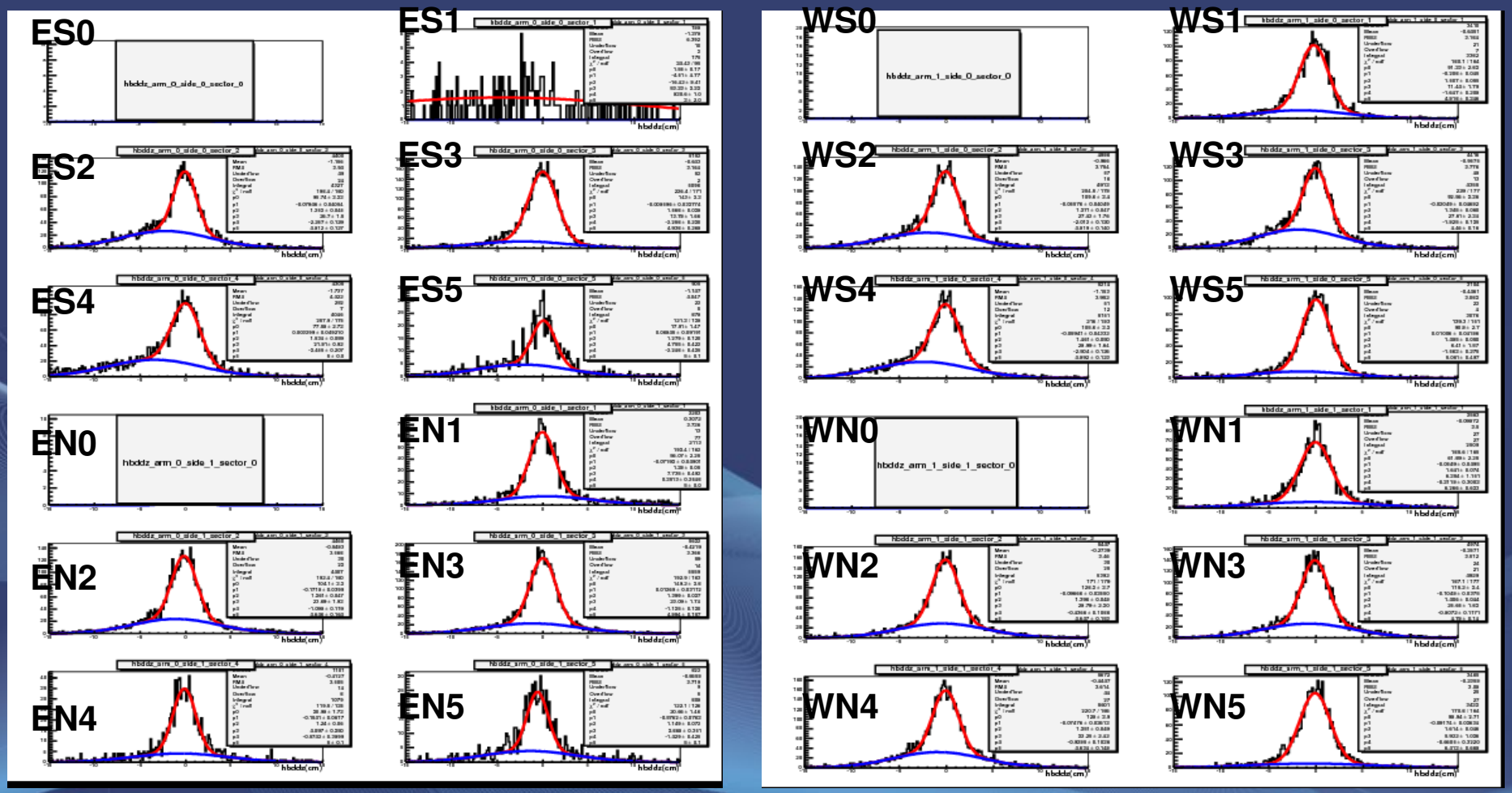
Continue for back up slides.....

dphi matching Distribution

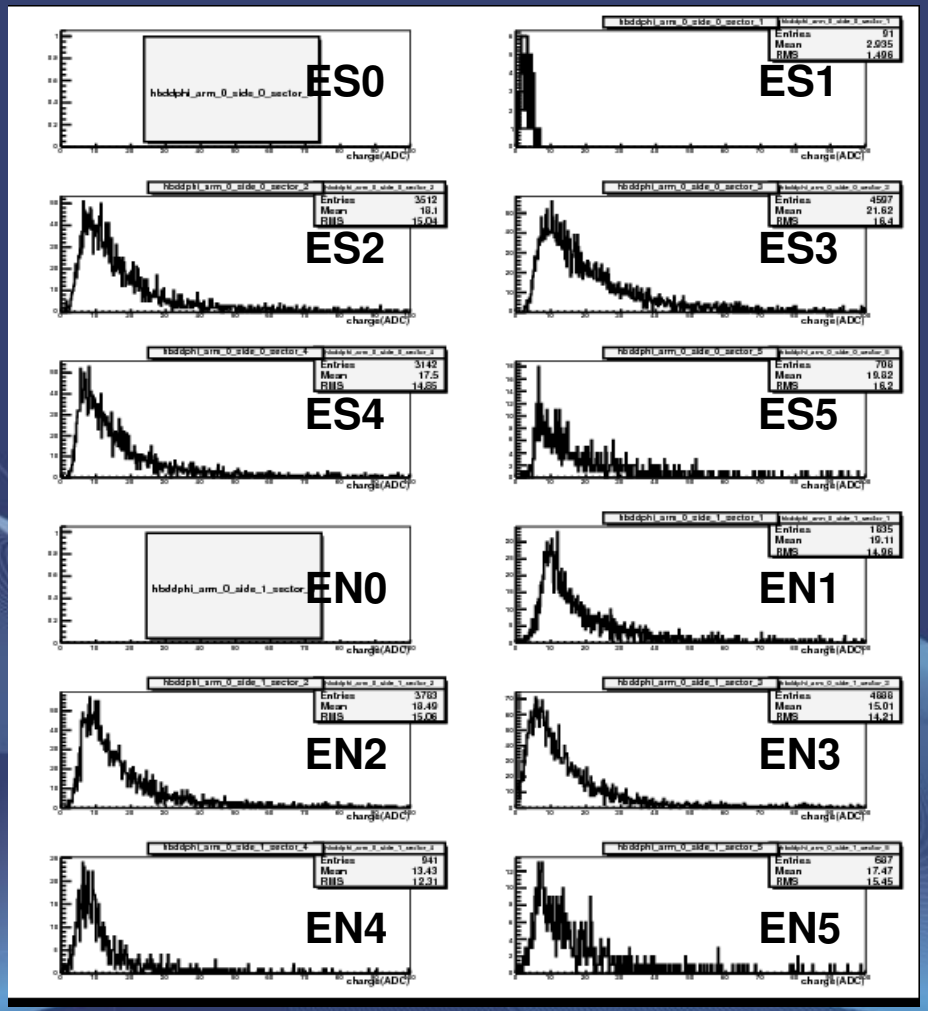


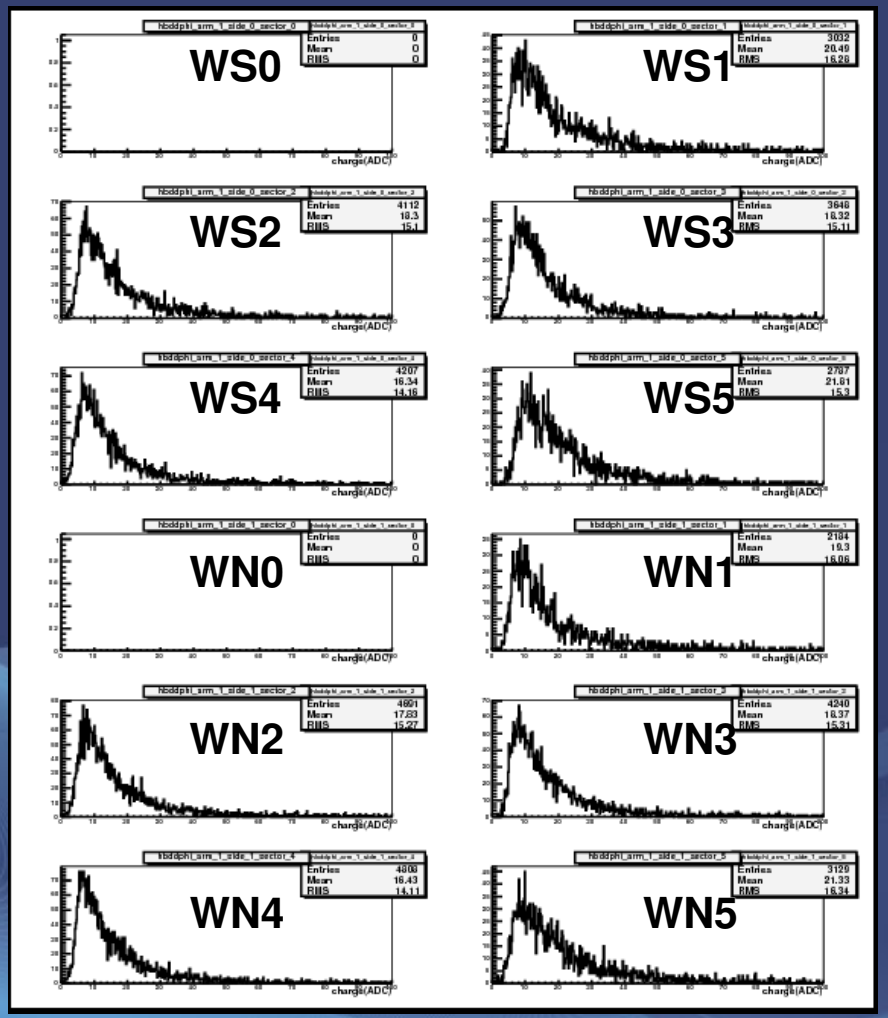


dz matching distribution for dphi<0.04 rad

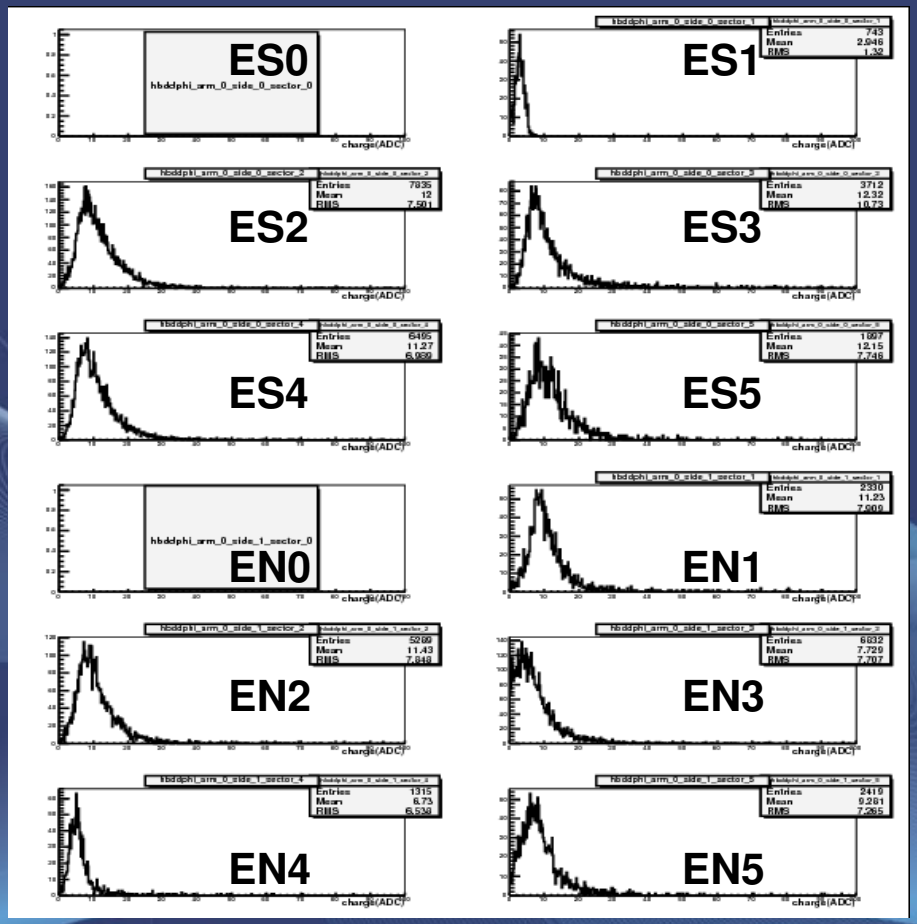


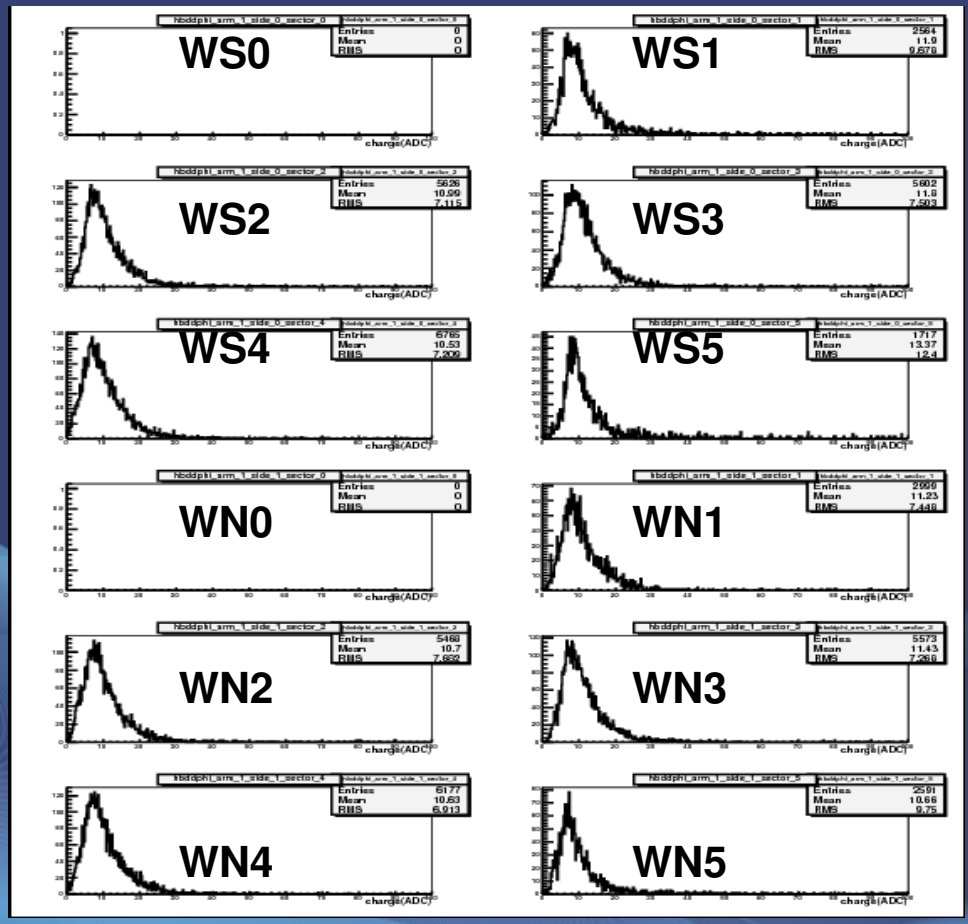
True + Fake tracks (dz<5 cm && dphi<0.04 rad)



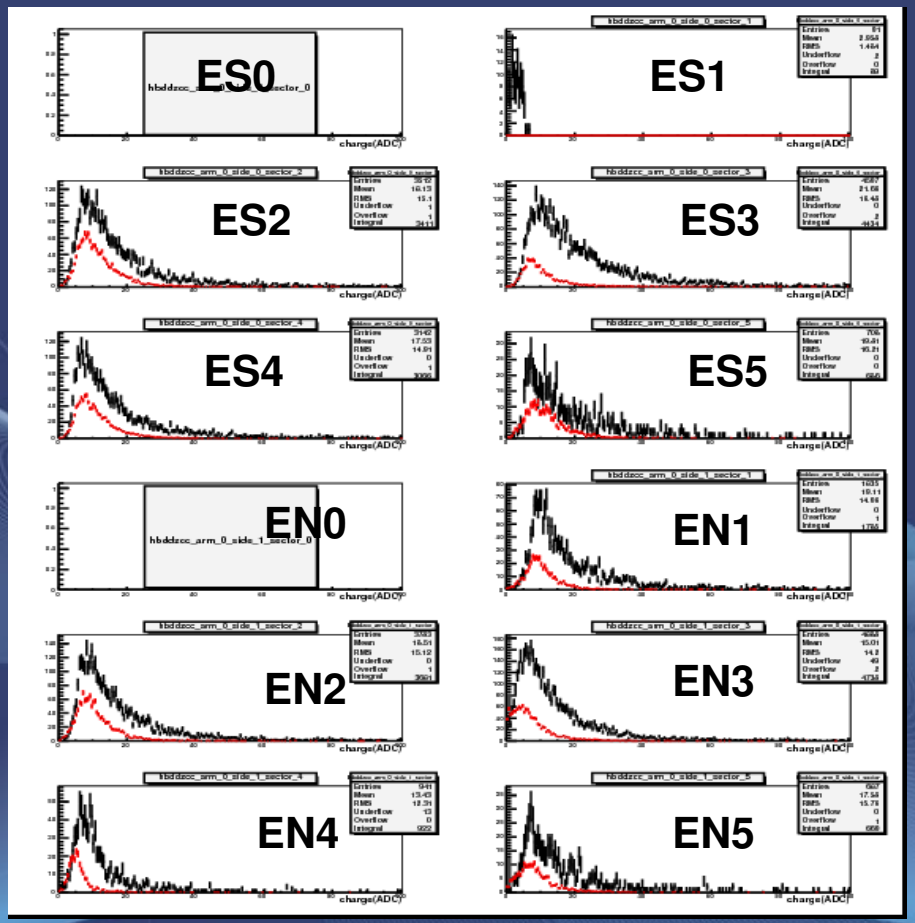


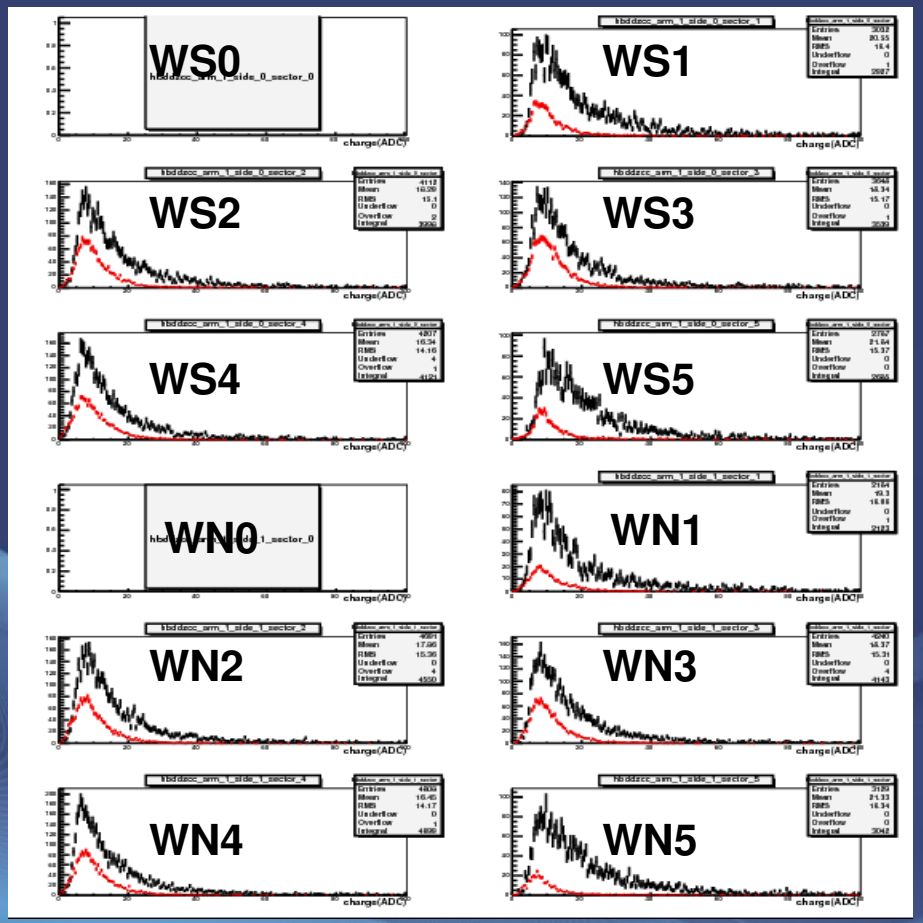
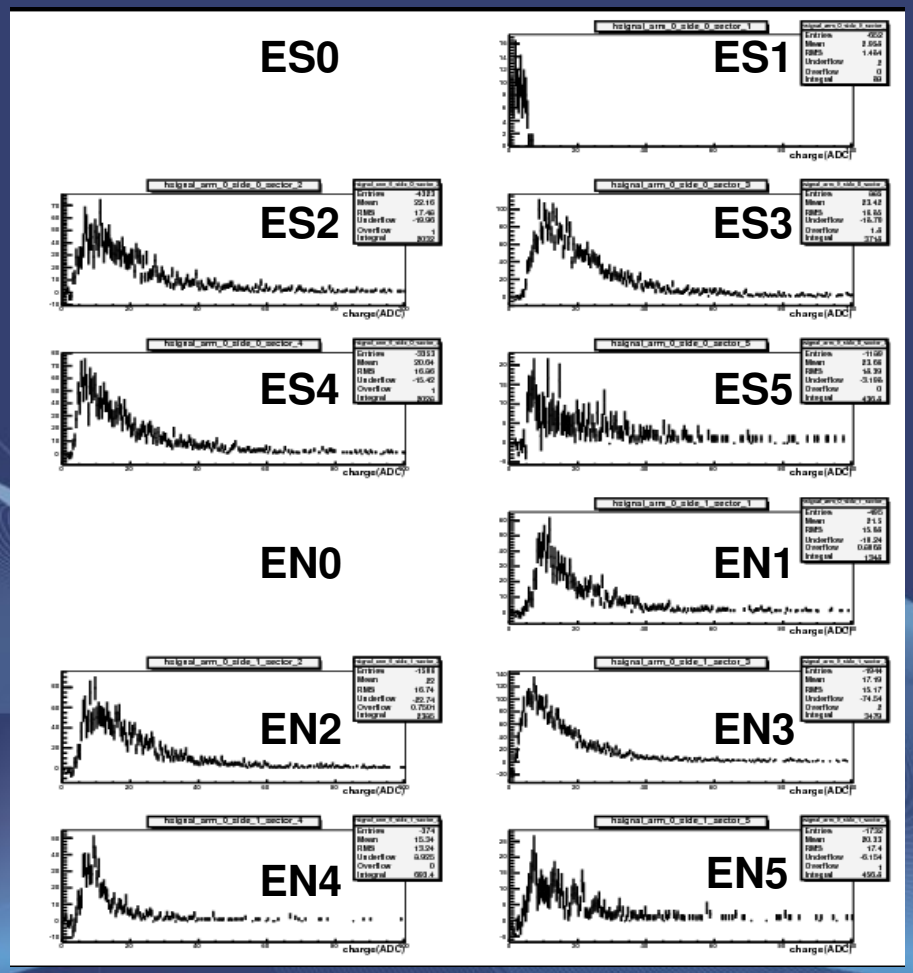
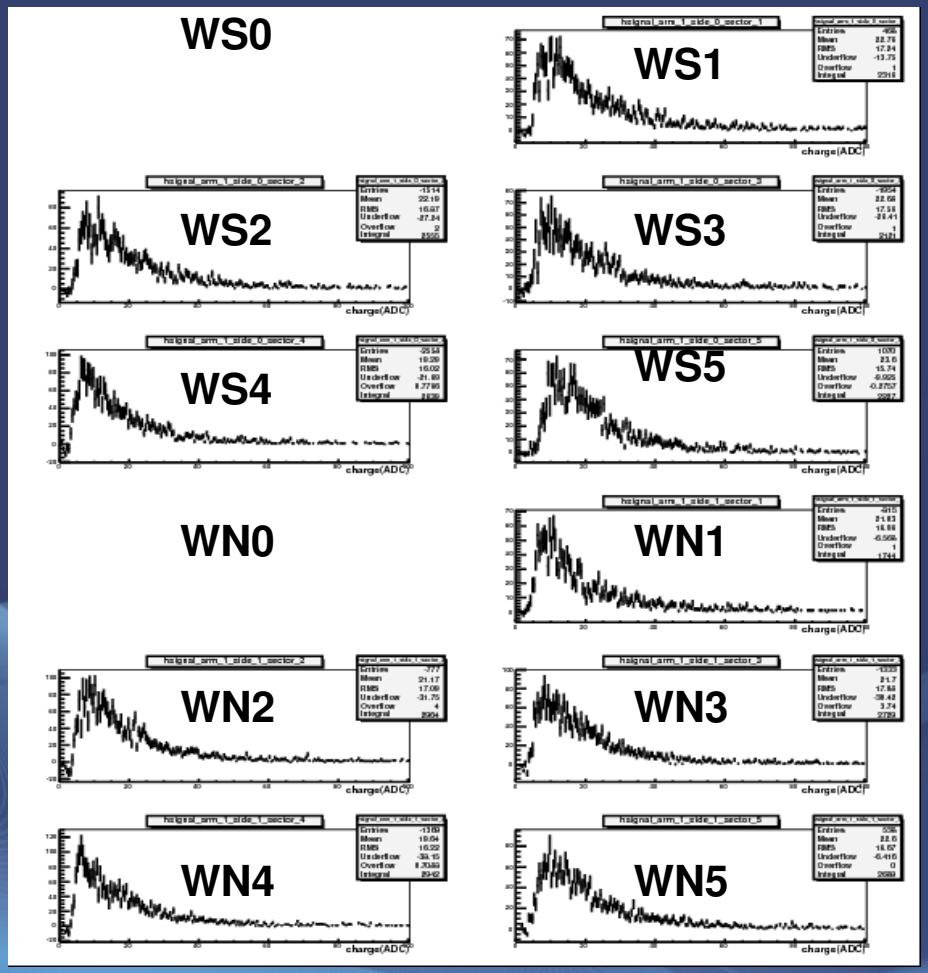
Fake tracks
(out side the matching window of HBD)





True +Fake tracks & normalized Fake tracks





True tracks after fakes subtraction