DRAFT

Towards an EE FPPA spec

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Factors, Mean values for operation at eta=2.0

	Factor	Comments
VPT yield, 1.8 T (RAL)	**<34>**	**e/MeV (see Fig) from average crystal LY, before irradiation**
At 4T	**0.9**	**Drop between 1.8T and 4T**
HT setting	**0.9**	**800/600 rather than 1000/800**
VPT Faceplate darkening	**0.95**	**Early darkening, not linear with time. Estimate 5% loss at eta=2. Measured 10% loss after 20kGy, eta=2.6, 10 yrs.**
VPT 'burn in' of photo-cathode	**0.9**	**Happens early, then flattens**
Crystal LY loss	**<0.76>**	**Average at high luminosity, eta=2.0 (see Fig)**
NET TOTAL	**<17.9>**	**e/MeV**
Permittable noise for 150 MeV/ch	**2680**	**Electrons.**
Permittable noise including a 30% safety factor	**1880**	**Electrons. Safety factors:** • **umbilical ie70 cm, not 50 cm** • **cable capacitance > 1pF/cm (ie need Kapton rad resistant cable)** • **5x5 quadrature addition over wide range of noise/ch values** **(to be followed up)**

Comments : relax 150 MeV/ch towards higher eta ?
Check what cuts applied to conclude 150 MeV/ch appropriate target in EE.

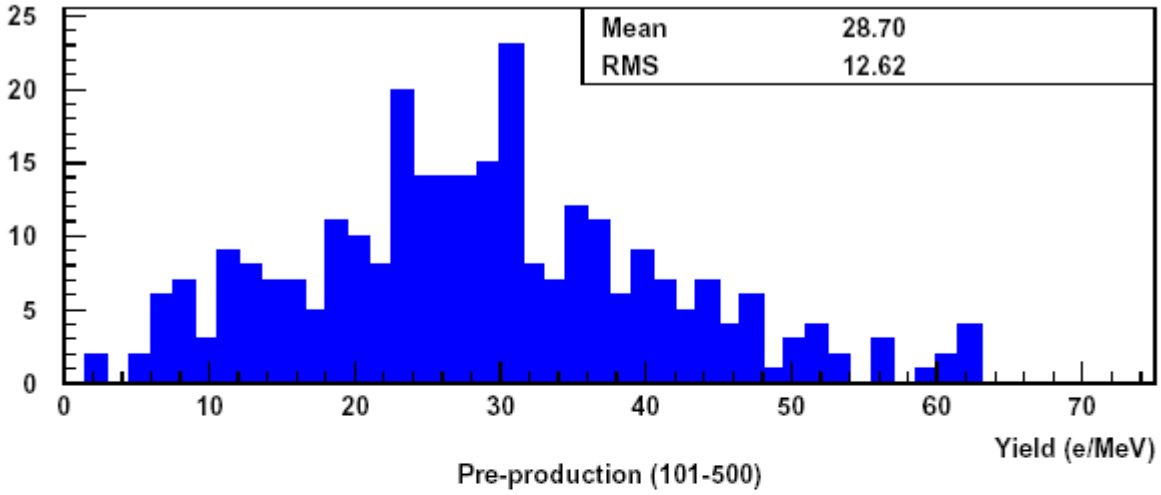
Factors, Spreads

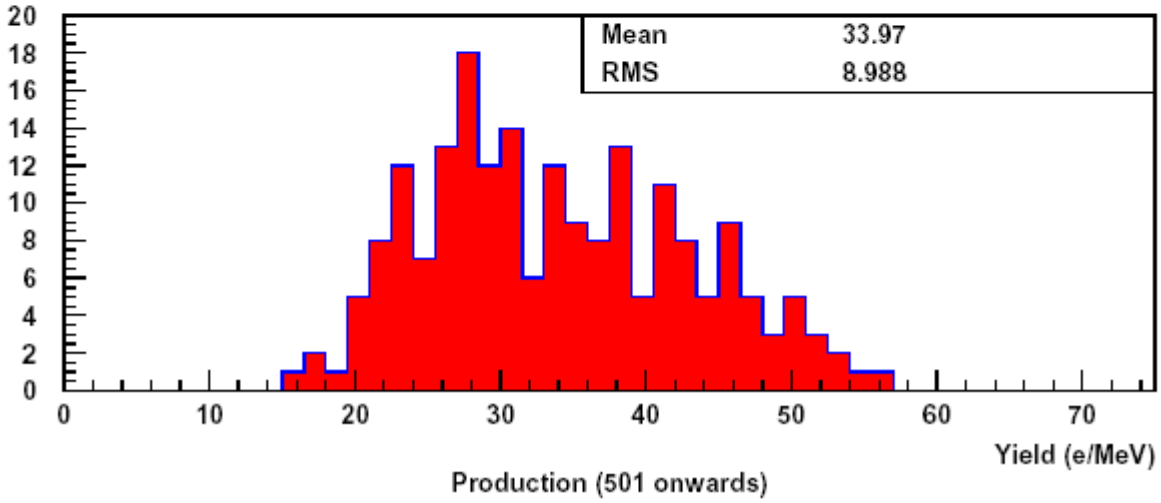
1) VPT yield spread ~30 %
2) Xtal LY spread ~ 14%

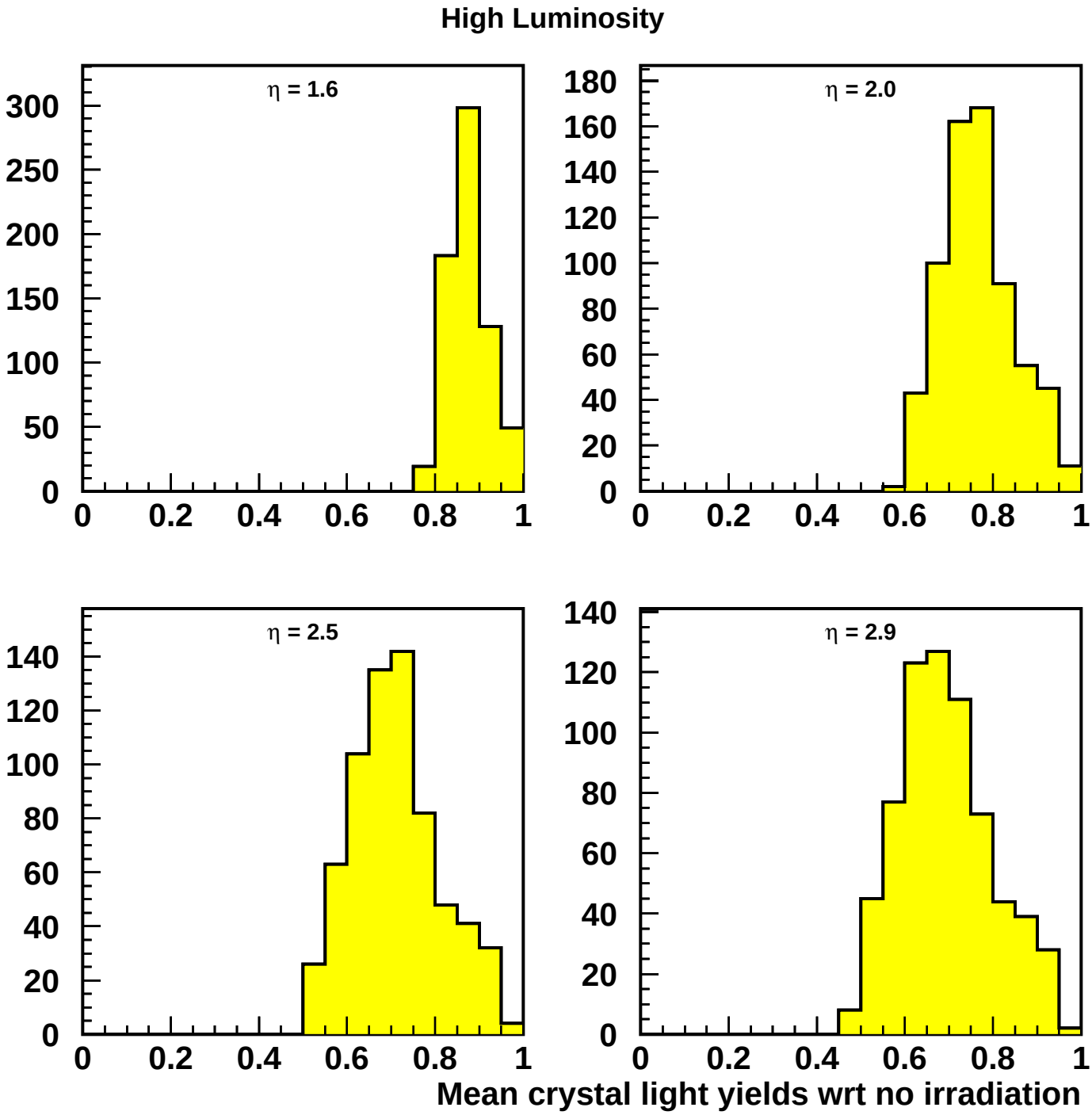
Total spread 33% (adding 1) and 2) in quadrature).
Dominated by VPT yield spread.
Matching VPT-xtal rad hardness will only give modest improvements

Adding 5x5 channels in quadrature – noise will be disproportionately dominated by lowest VPT yield/lowest xtal light yield pairings. Hence need for some safety factor as indicated in table above.

VPT yield measured at 1.8T (RAL)






High Luminosity
η = 1.6
η = 2.0
η = 2.5
η = 2.9
Mean crystal light yields wrt no irradiation