

First look to Winter 2010 **background simulation in EMC**

SuperB Workshop
Background Session

Pasadena
16/12/2010

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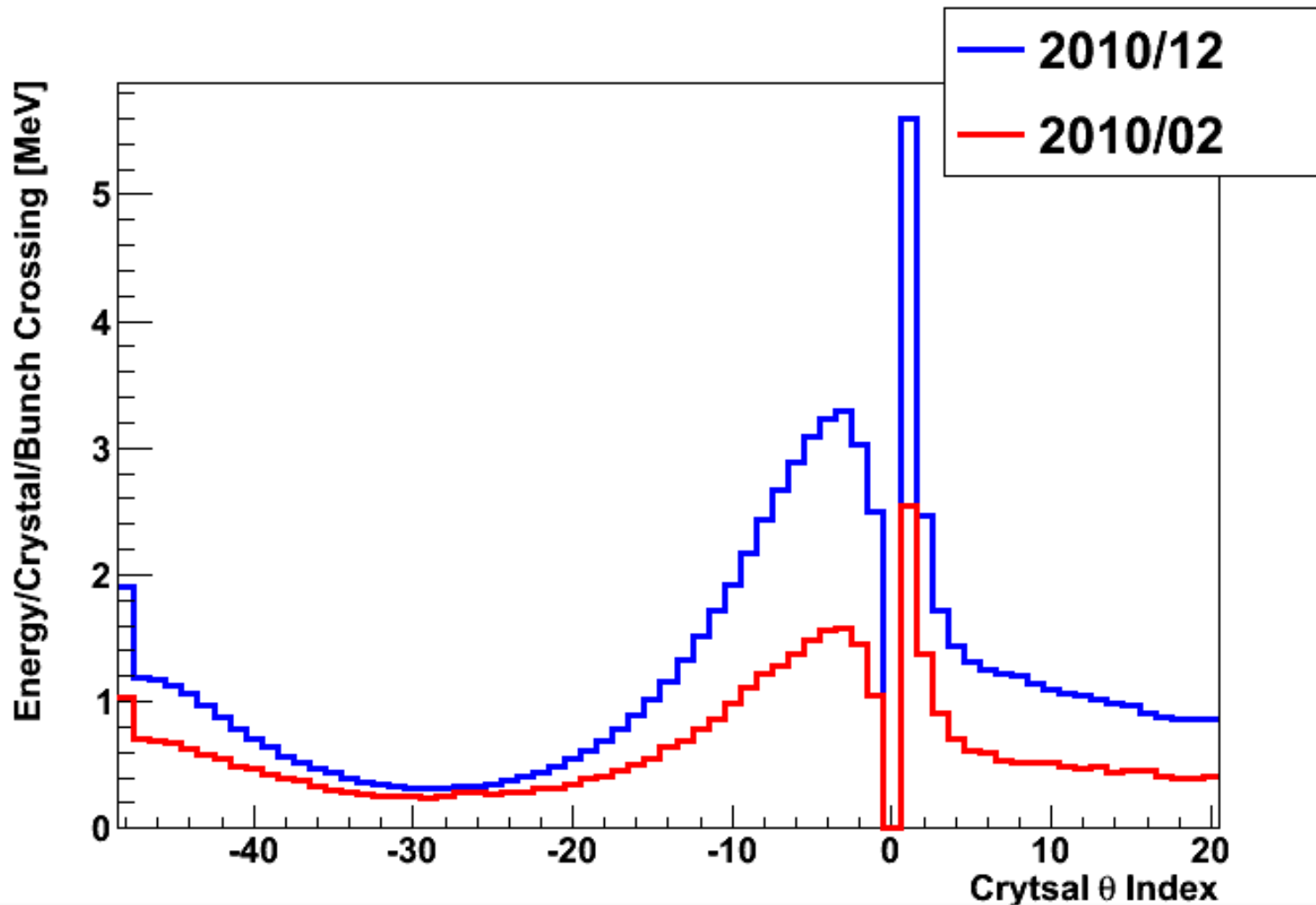
Intro

**Aim: comparisons of basic EMC quantities
between February and December
background productions**

Summary:

- EMC hits and energy deposit**
- Particles spectra at EMC boundary**
- Particles flux at EMC boundary**
- Conclusions**

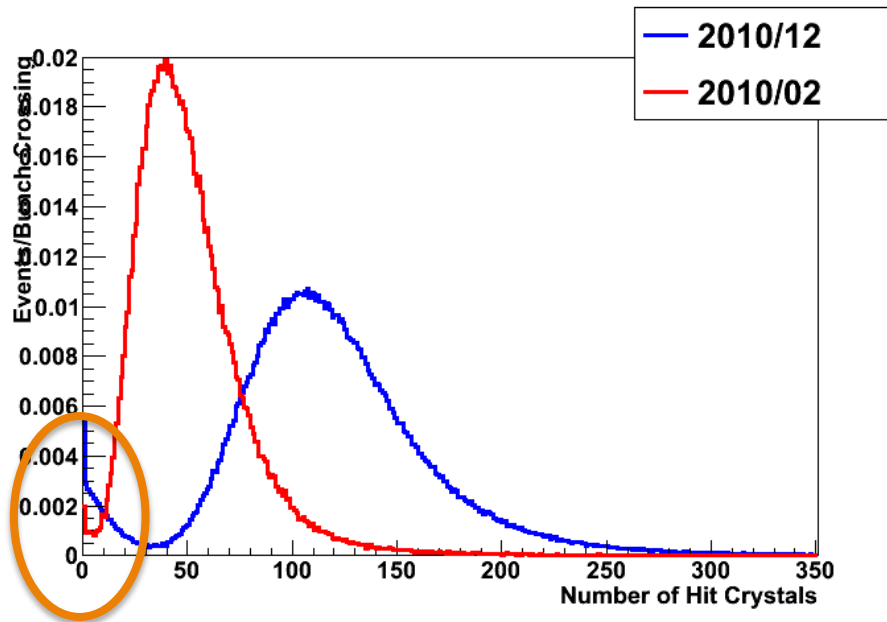
Crystal energy deposit vs theta



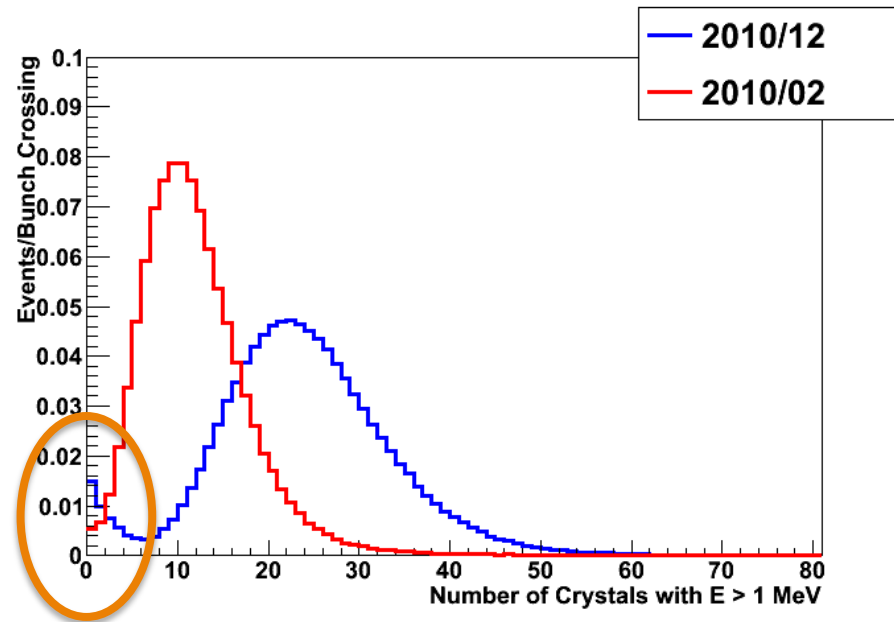
Energy deposit per crystal per bunch crossing is higher in Winter production (2010/12)

EMC hits

Crystals with $E > 0$ / Bunch Crossing



Crystals with $E > 1$ MeV / BC

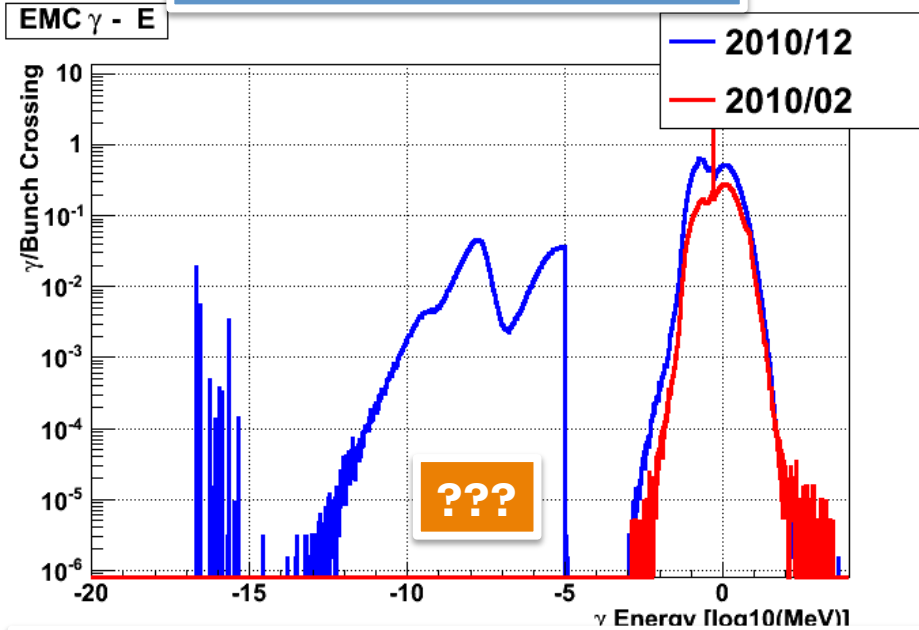


Different behaviour at low multiplicity

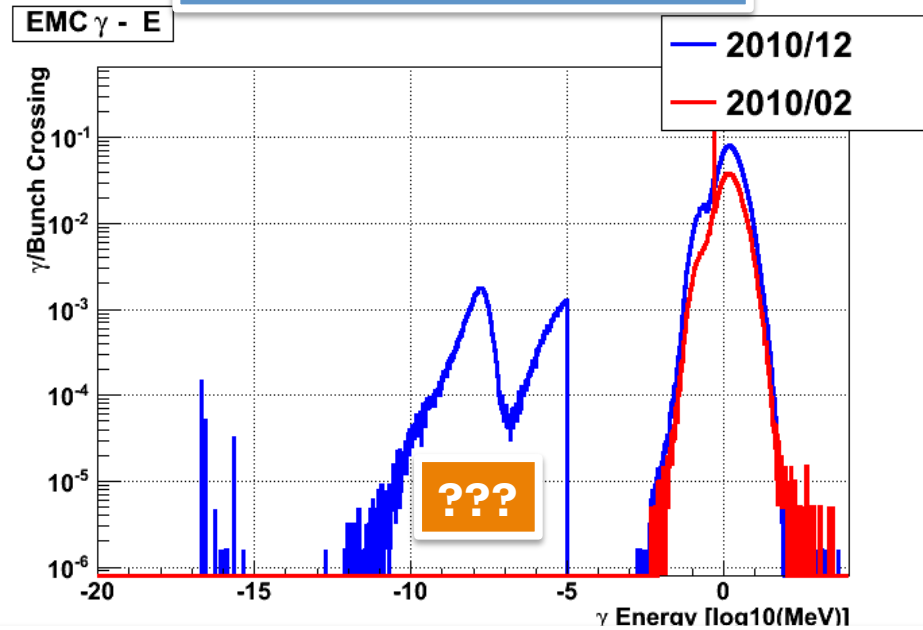
Winter production shows higher crystal multiplicity
Distribution peak is at $\sim x2$ multiplicity

EMC boundary γ spectrum

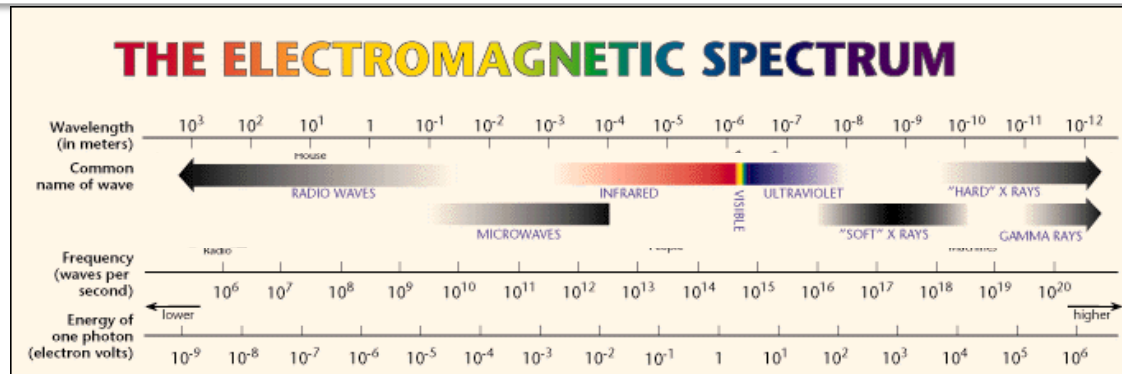
All γ



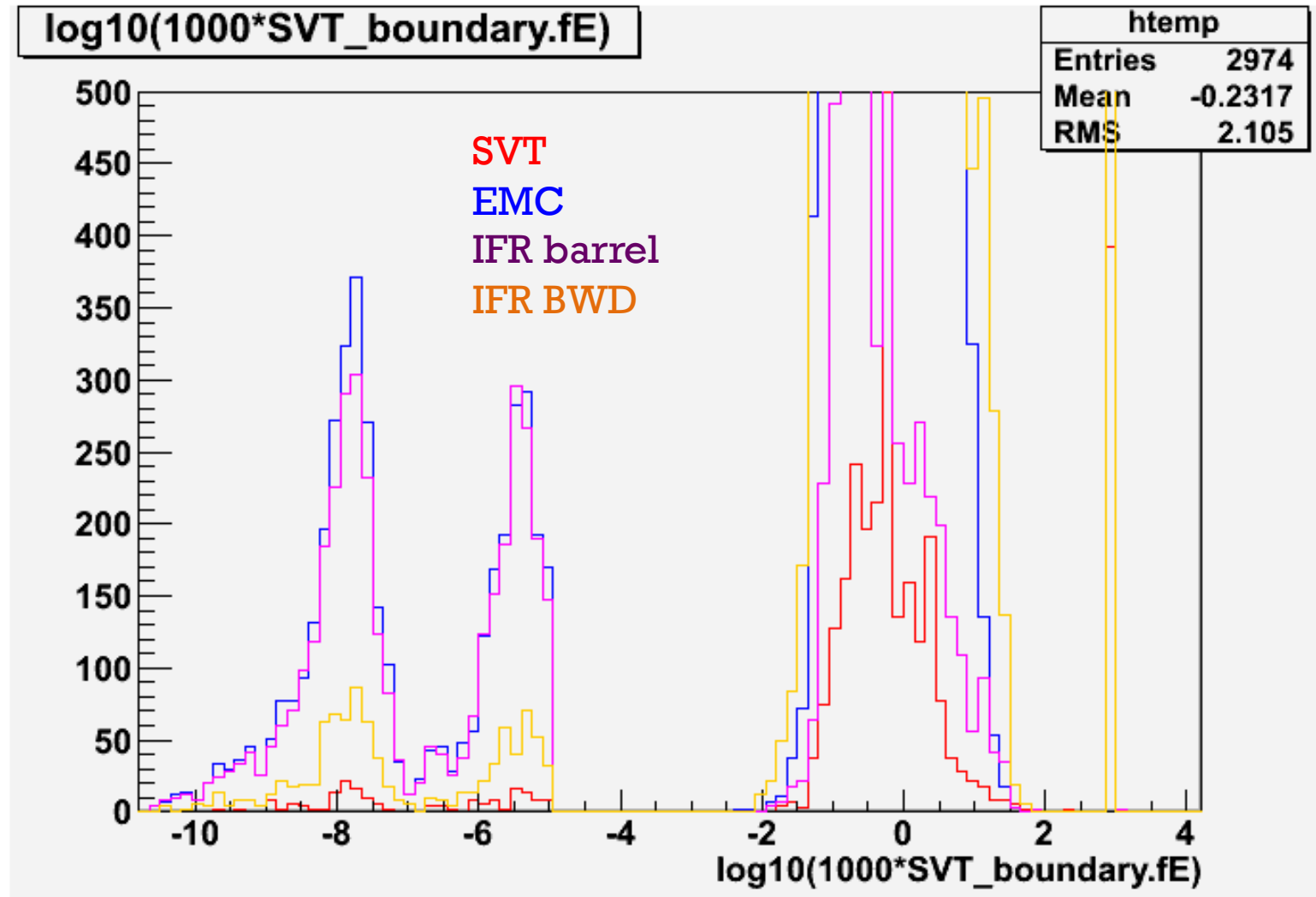
γ entering EMC front



2010/12 production has a completely new photons population at very low energy (from radio to ultraviolet !!!)

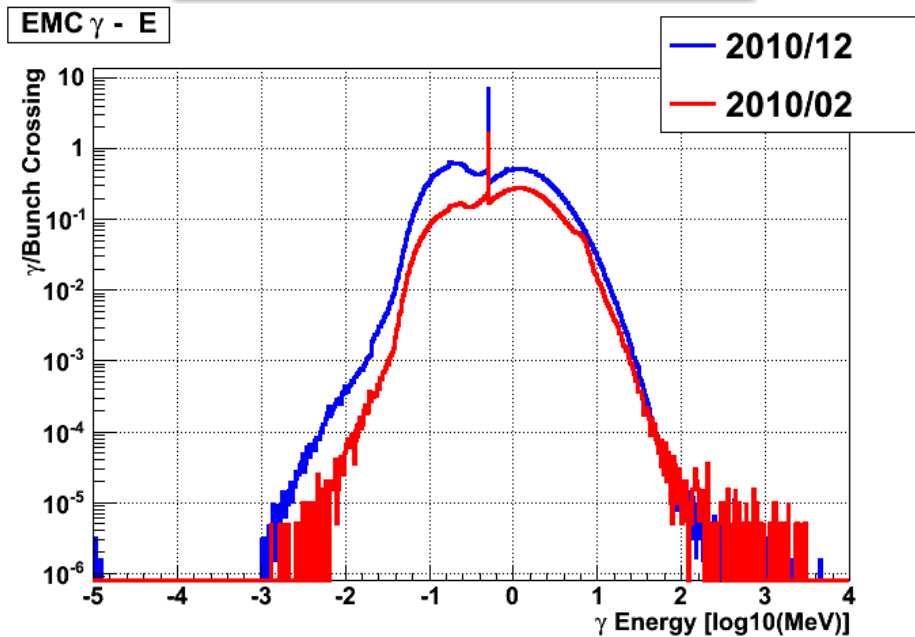


Detectors Boundaries Energy

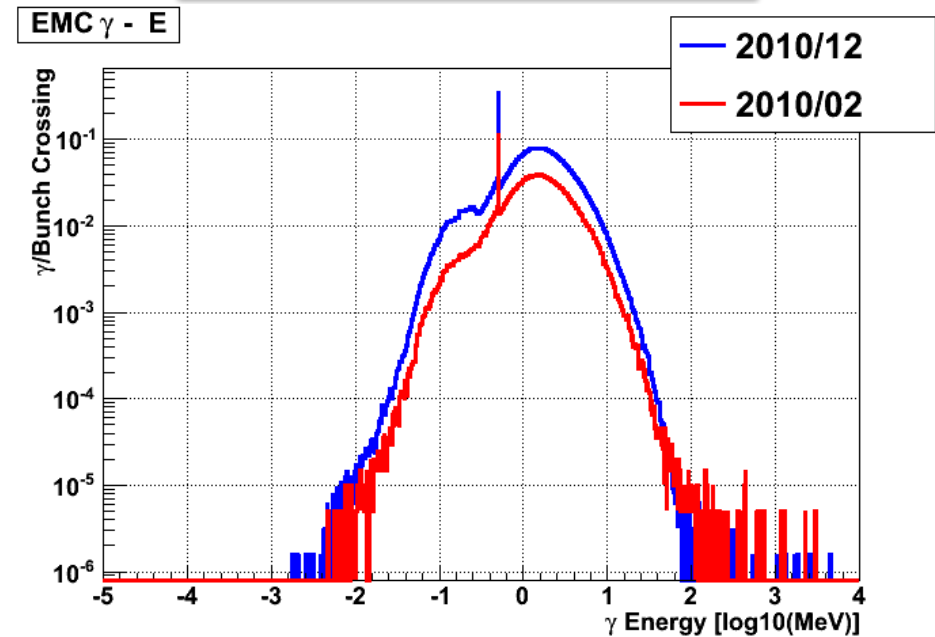


EMC boundary γ spectrum (ZOOM)

All γ



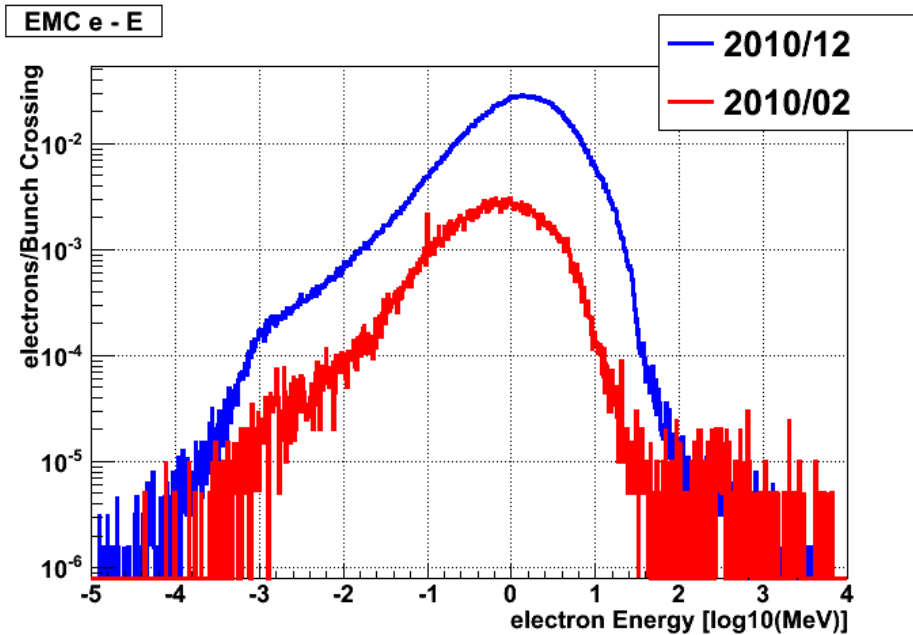
γ entering EMC front



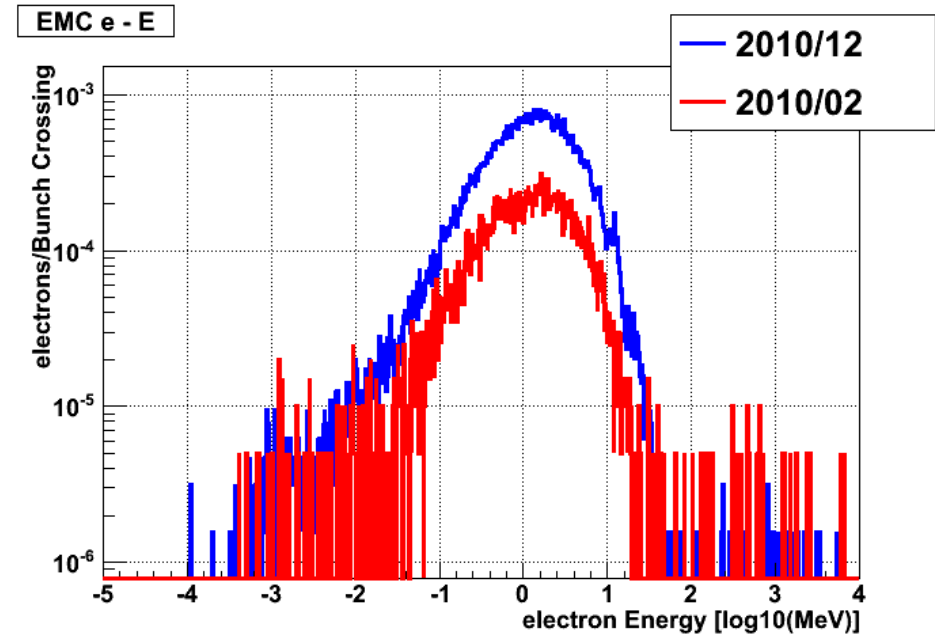
In the “high energy” photon range the two productions show similar spectra but December production has higher flux

EMC boundary e spectrum

All e

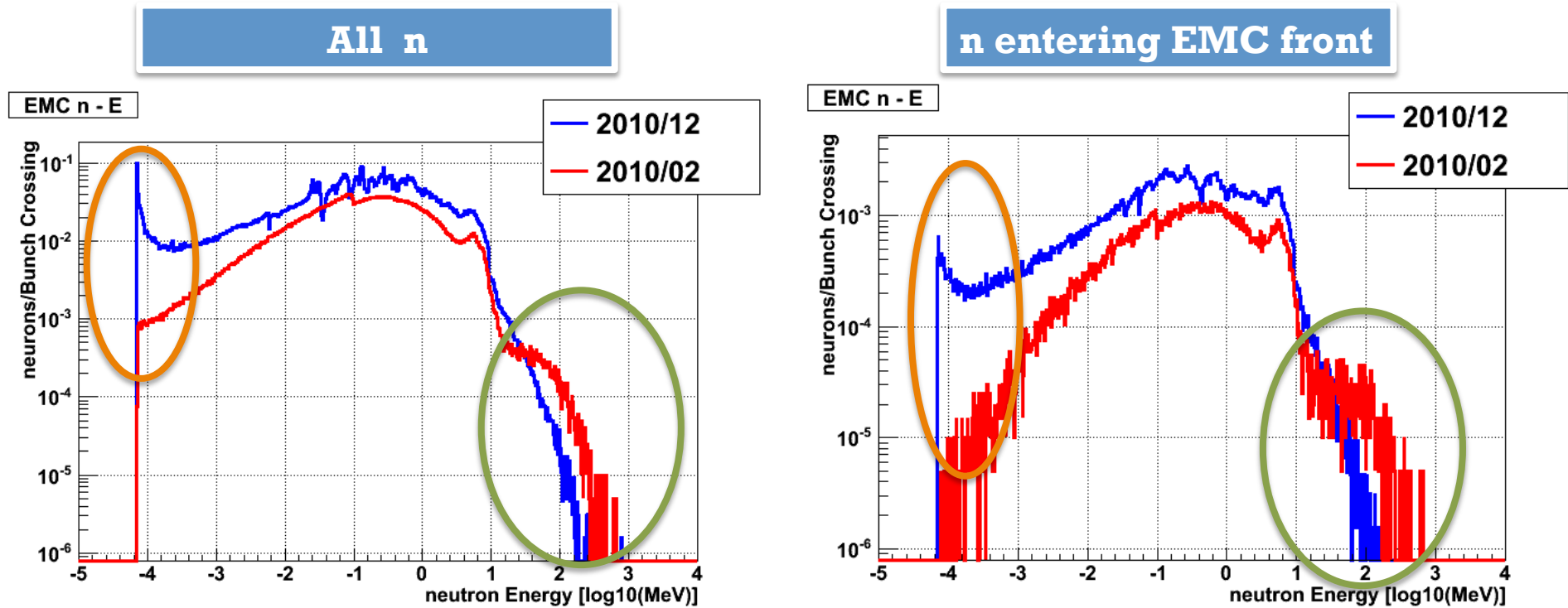


e entering EMC front



The two productions show similar electron spectra but December production has higher flux

EMC boundary n spectrum

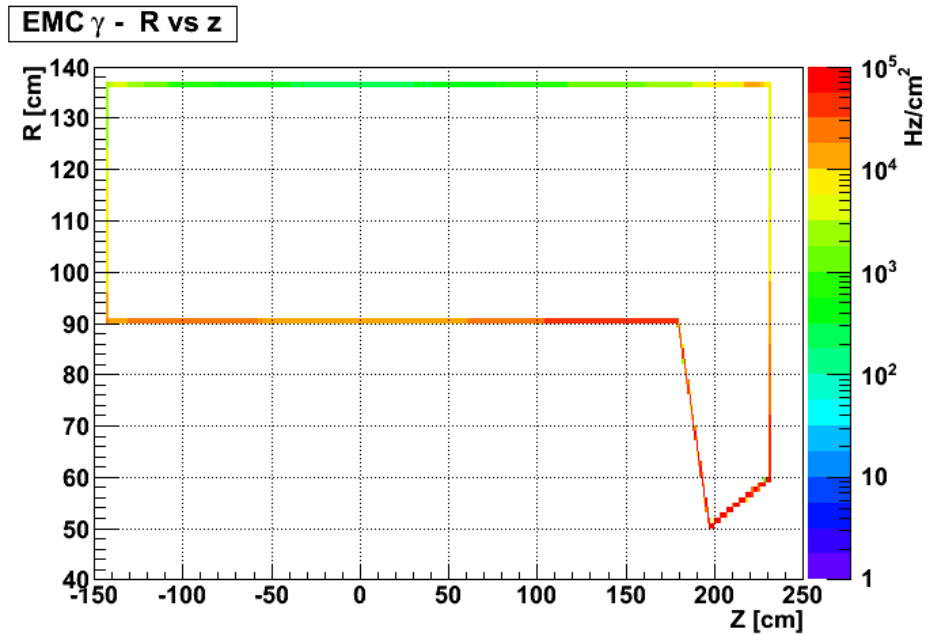


December Production has much higher low energy neutrons flux

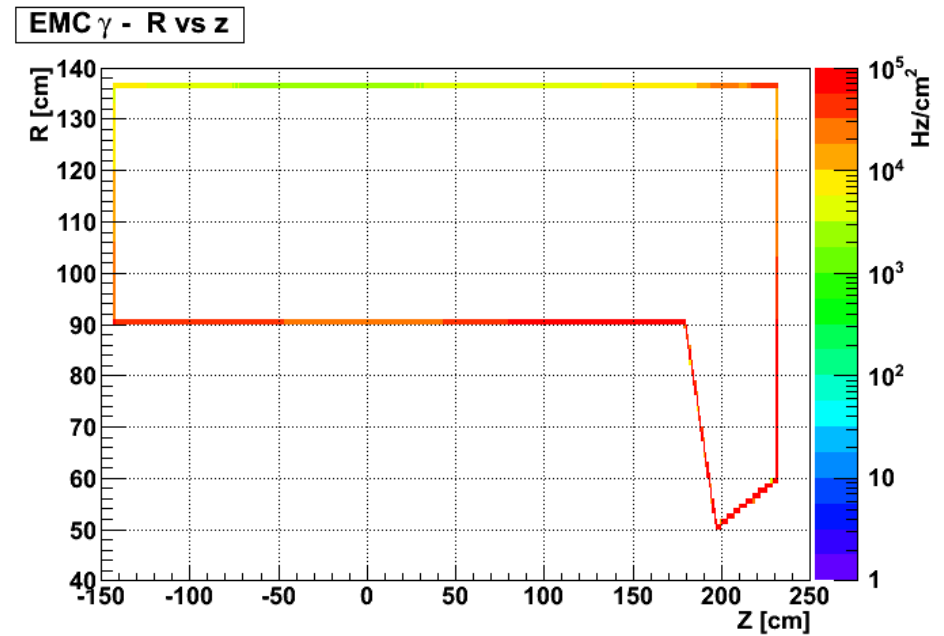
December Production has lower neutrons flux at high energy

EMC boundary γ rates

2010/02 Production



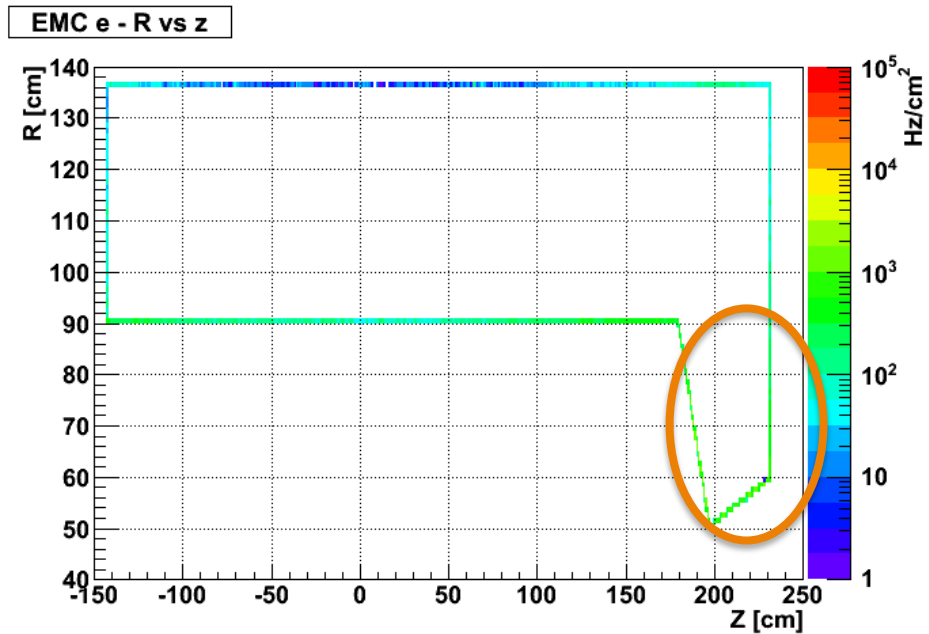
2010/12 Production



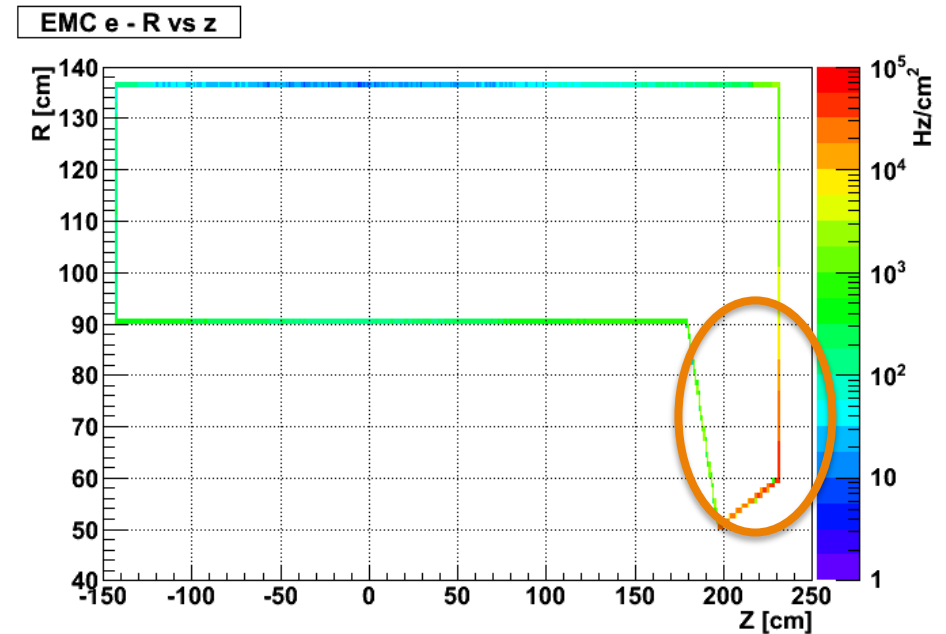
The two productions show similar behaviour
December production has higher flux

EMC boundary e rates

2010/02 Production



2010/12 Production

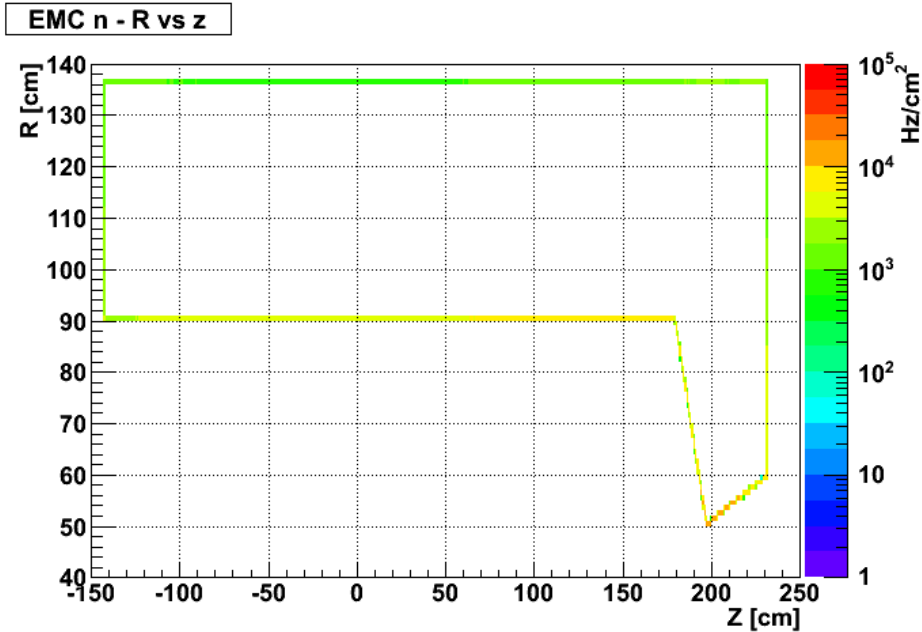


December production has higher flux

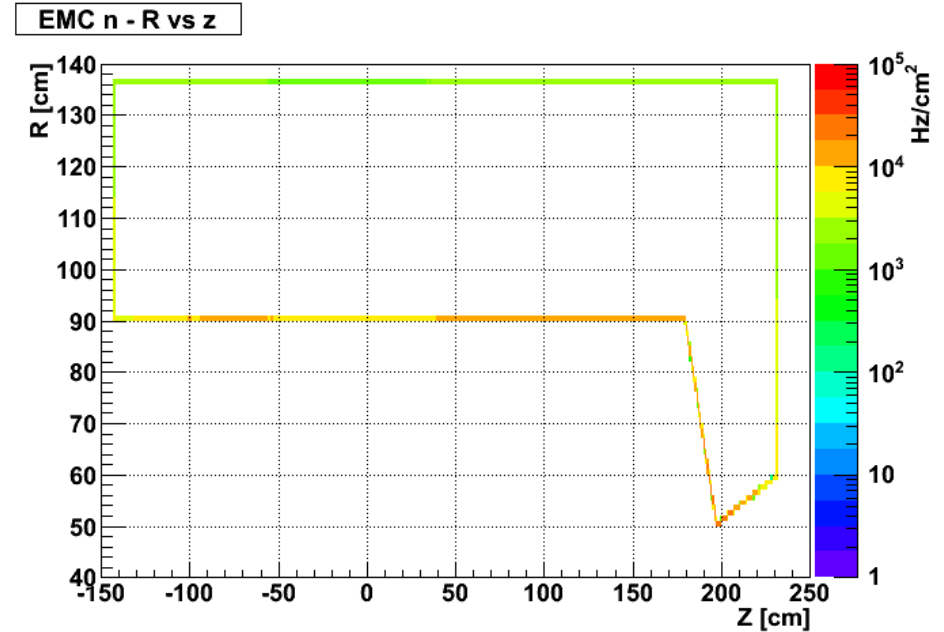
Back part of Fwd EMC seems to be hotter in December production (?)

EMC boundary n rates

2010/02 Production



2010/12 Production



The two productions show similar behaviour
December production has higher flux

Conclusions

- December production shows higher flux and energy deposit
- Electrons and γ spectra are similar for the two productions
 - Very low energy photons spectra in December production need to be understood
- Neutrons spectrum
 - Significant higher flux at low energy (< 1 keV) for December production
 - Lower high energy flux in December production