Very front end noise for ECAL Endcaps

from JP Walder, Lyon, Sep 1998

Endcap preamp

2 TeV corresponds to 6 pC (1/10 of barrel dynamic range with 2 APDs)

Input capacitance of VPT + cable : Cd = 35 pF

GmM1=40 mA/V
Noise slope : 20 e/pF

With one VPT assume 18 electrons/MeV **out** of VPT at 4 T

Dynamic range (TeV)	Total ENC	Noise in MeV
2	2000	111
1	1800	100

Barrel preamp (for comparison)

For 2 APDs, 4 p.e./MeV, M=50
Cd = 250 pF, τ = 40 ns, gmM1=65 mA/V, noise slope = 15 e/pF

Dynamic range (TeV)	Total ENC	Noise in MeV
2	8000	40
1	6800	34
0.5	6200	31

N.B.
both endcap and barrel preamps assumed to have a fixed full scale output voltage of 2 V which determines the value of the feedback resistor which is given by Rf = Vmax. τ. e/Qmax. The larger Rf, the smaller the dynamic range contribution to the noise.