Baseline scenarios for the LHeC CDR

14.4.2009

These are scenarios to characterise the LHeC potential, considered for cross consistency of simulation studies. The CDR and experience with the LHC, plus the sLHC plan, will lead to specifications and modifications of assumptions made below.

config.	E(e)	E(N)	N	$\int L(e^+)$	$\int L(e^-)$	|Pol|	$L/10^{32}$	P/MW	years	type
A	20	7	p	1	1	-	1	10	1	SPL
B	50	7	p	50	50	0.4	25	30	2	RR hiQ^2
C	50	7	p	1	1	0.4	1	30	1	RR lo x
D	100	7	p	5	10	0.9	2.5	40	2	LR
E	150	7	p	3	6	0.9	1.8	40	2	LR
F	50	3.5	D	1	1	--	0.5	30	1	eD
G	50	2.7	Pb	0.1	0.1	0.4	0.1	30	1	ePb
H	50	1	p	--	1	--	25	30	1	lowEp

Electron energy in GeV, proton energy in TeV, integrated luminosity in fb^{-1} . The luminosity in B,D,E may be assumed to be split among the 4 states (2 charges and 2 polarisations), thus the total luminosity is $2*[L(e^+)+L(e^-)]$. The Linac is twice as efficient as the ring as the luminosity does stay constant with time. The positron intensity for LR is assumed to be half of the electron intensity. P is the power in MW. The LR luminosity scales like P/E_e. The RR luminosity scales like $P/E_e^{\,4}$. B and C so far differ by the assumed acceptance range, highest luminosity may require to put magnets close to the IR, such that the acceptance (B) is limited to about $5\text{-}10^o < \theta(e,h) < 170\text{-}175^o$. The low x configuration C will have larger acceptance, typical assumptions are $0.5\text{-}1^o$ and $179.5\text{-}179^o$. F is deuterons, G lead and H ep at low E_p.