

# H1 Status

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H1 Collaboration

## *Topics*

- Status of Detector
- HERA II Startup
- $e^+p$  vs  $e^-p$

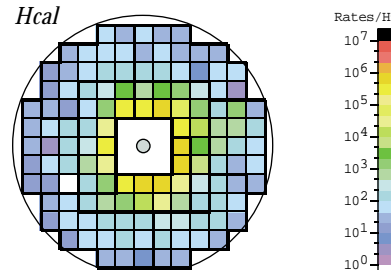
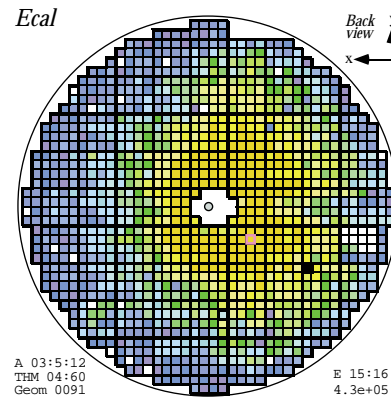
# Status of Detector

## Components

- all critical components in place
- Central Inner Proportional Chamber (CIP) being commissioned

## Backgrounds

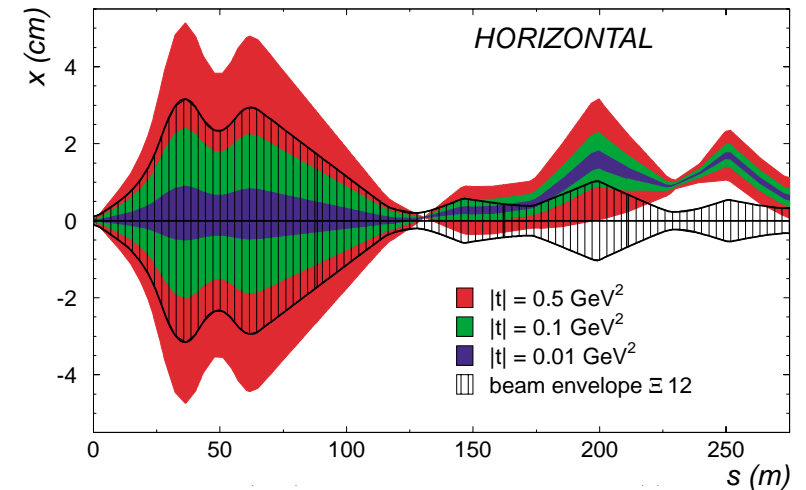
- see largely increased rate of synchrotron radiation in SpaCal



- chamber rates prohibitive even at low gas gain (some BPC wires destroyed)

## Future Components

- VFPS



- LPOL

HERA long term shutdown planning needed, i.e. 2002/3 shutdown

# HERA II Startup

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## *Goals of HERA II*

- integrated luminosity ( $1 \text{ fb}^{-1}$ ) at the highest CM energy
- polarised beams
- some luminosity at lower  $E_p$

## *Short term Strategy*

thorough understanding of

- beam optics
- beam positions/tilts
- backgrounds  
in particular safe handling of synchrotron radiation at high currents

to enable

- smooth long-term operation

# Beam Polarity

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*...from the Minutes of the  
HERA Coordination Meeting 14.5.01*

*...*

*There was a discussion whether one week of HERA operation with high luminosity (about  $4 \cdot 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$ ) would be sufficient before switching to electrons. The decision of the switch over date was postponed until the next meeting.*

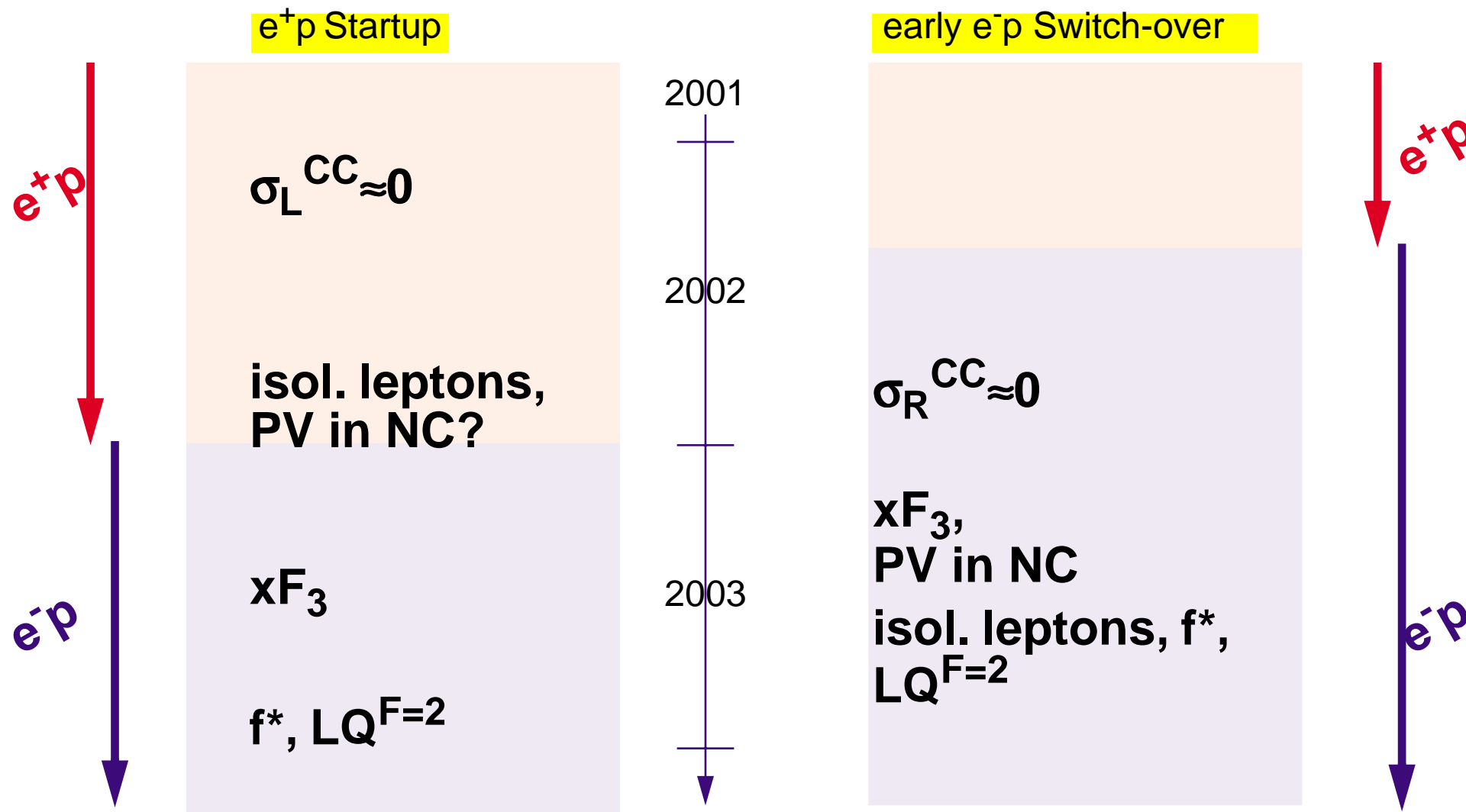
*H1 Proposal for Running in 2002*

- continue  $e^+p$  running till end of running period 2002
- change to  $e^-p$  operation in winter shut-down 2002/3 and then integrate a large luminosity in  $e^-p$

*Reasons*

- step wise learning curve for machine and experiments
- well matched physics time profile

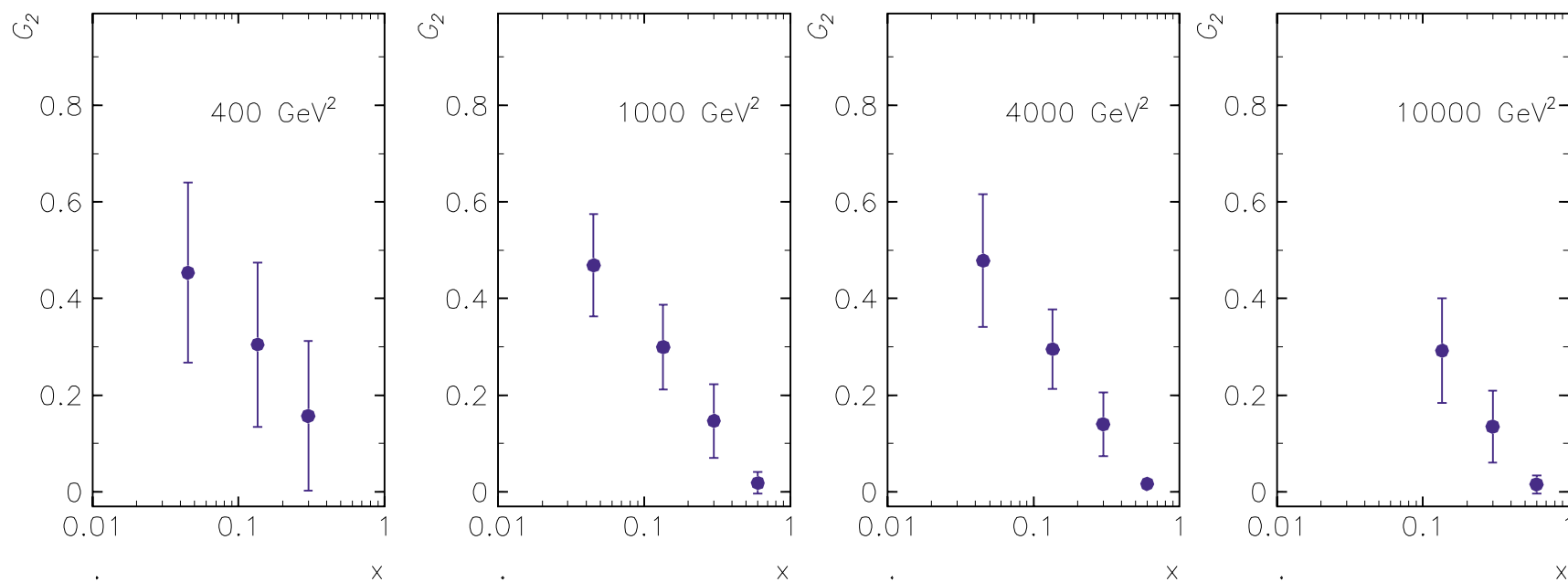
# Anticipated Results from Upgraded HERA at Summer Conferences



# Parity Violation in NC

## *Genuine Parity Violation in $\gamma Z$*

- best observed in  $G_2$  (sister of  $F_2$ )
- example:  
e<sup>+</sup>p only,  
2\* 50 pb<sup>-1</sup> at P=0.5



# Polarity / Polarisation Matrix for BSM Physics

model	beam charge	best polarization	
		left	right
right handed currents (CC)	$e^-$	- -	$e_R^- \rightarrow \nu_R$ ( $W_R$ )
SUSY $R_P$ Violating	$e^+$		$e_R^+ \rightarrow$ $\bar{u}_L, \bar{c}_L, \bar{t}_L$
	$e^-$	$e_L^- \rightarrow$ $\bar{d}_R, \bar{s}_R, \bar{b}_R$	
anomalous top	$e^\pm$	$t_{L,R}$	
$F = 0$ Leptoquarks	$e^+$	$S_{1/2}, V_0$	
		$e_L^+ \rightarrow \bar{V}_0^R$	$e_R^+ \rightarrow \bar{V}_1^L$ $e_R^+ \rightarrow \bar{S}_{1/2}^L$
$F = 2$ Leptoquarks	$e^-$	$S_0, V_{1/2}$	
		$e_L^- \rightarrow S_1^L$ $e_L^- \rightarrow \bar{V}_{1/2}^L$	$e_R^- \rightarrow \bar{S}_0^R$
Contact Interaction	$e^\pm$	various	
Quark Radius	$e^\pm$	any	
Large Extra Dimensions	$e^\pm$	any	
Excited Fermions	$e^\pm$	$e_L^\pm \rightarrow f_R^*$	$e_R^\pm \rightarrow f_L^*$
Excited Neutrinos	$e^-$	$e_L^- \rightarrow \nu_R^*$	

large lumi for stringent limit  
topical, large cross section

what is your favourite?

unique

# Summary

## Short Term

- establish high luminosity and exploit for physics
- hence  $e^+p$  in 2002

## Long Term

- evaluate all polarities and polarisation

and

- consider higher CMS energy which provide a quick gain in sensitivity
- explore low  $E_p$  for  $F_L$  measurement

