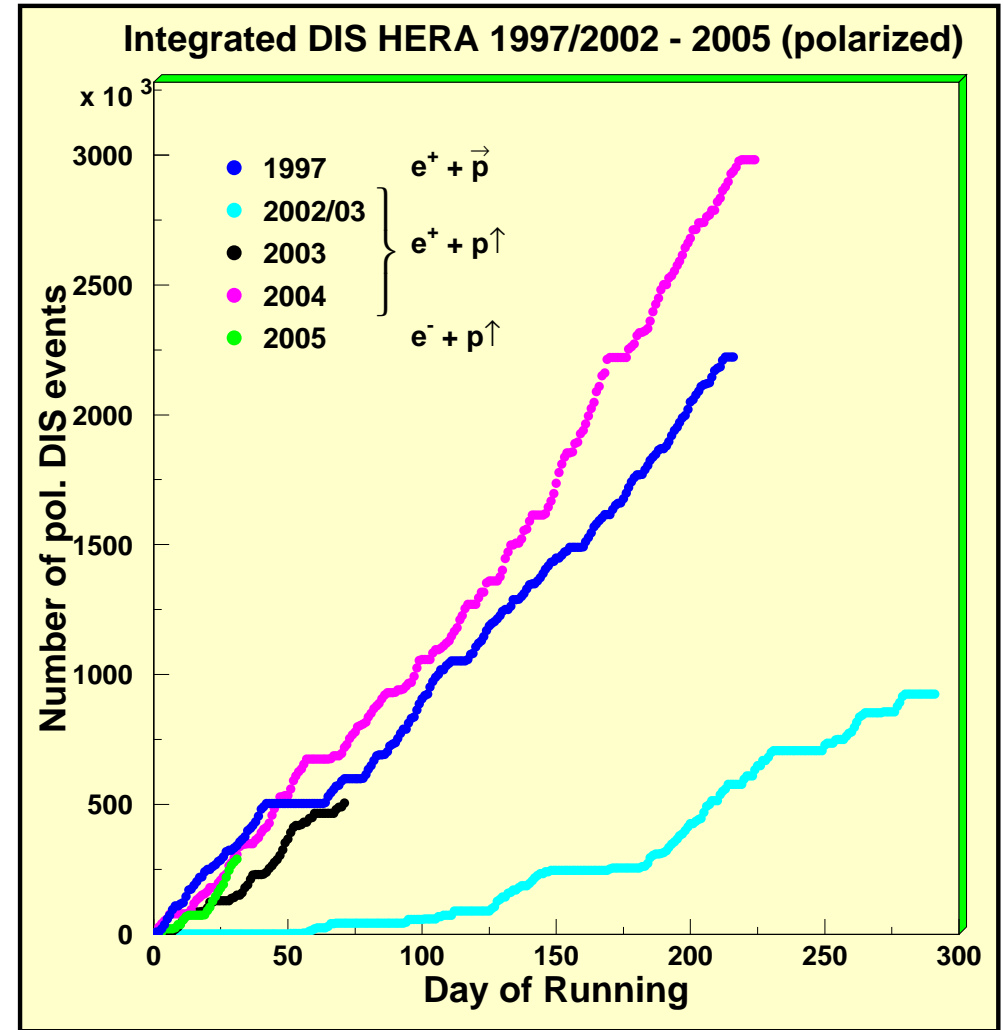
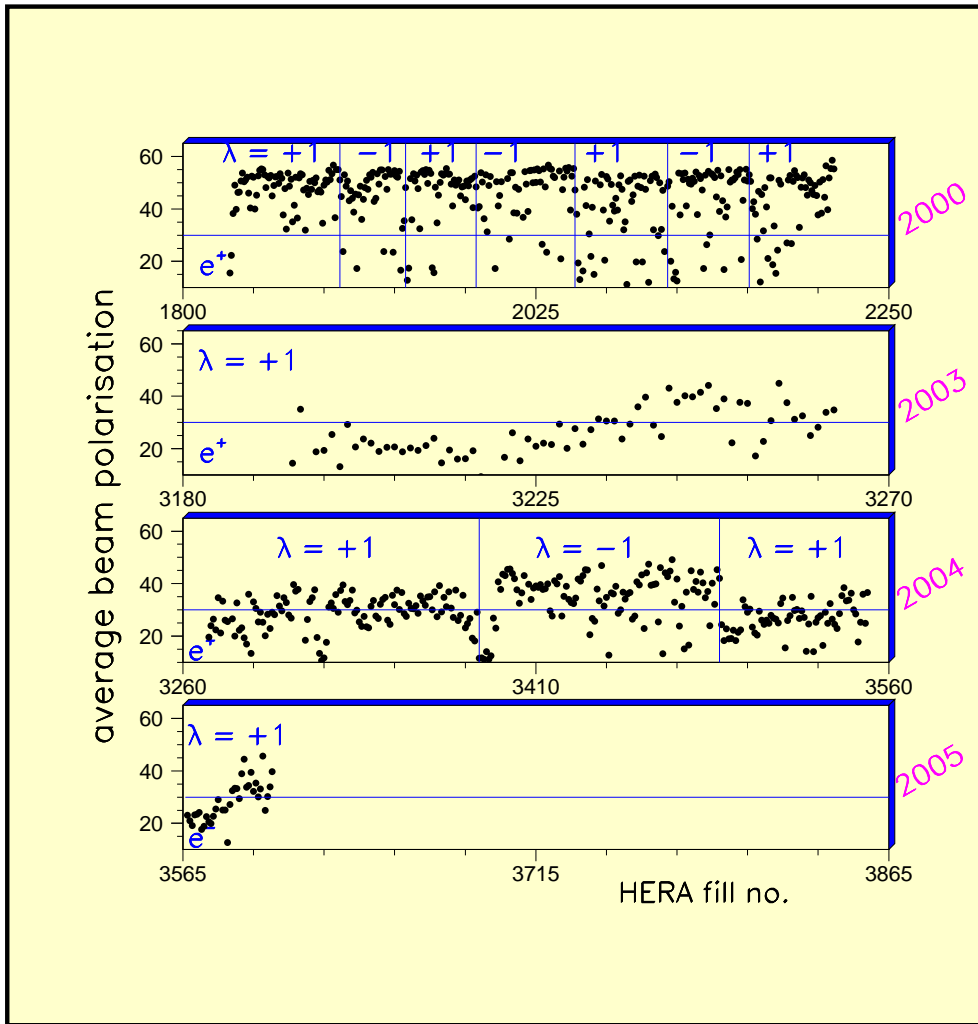


Impact on HERMES Physics Program

Polarization

HERA-II: always $\langle P \rangle < 0.45$ and strong helicity dependence



Impact on HERMES Physics Program

Physics Overview

Nov 2001

Running Mode Target Running Mode Beam	Transverse Polarized Hydrogen $P_{\perp} \sim 0.8$	Longitudinal Polarized Hydrogen $P_{\parallel} \sim 0.9$	Unpolarized H,D,He,Ne,Kr, ... 100 x ABS-density End-of-fill
Unpolarized Beam or Helicity balanced	Excl. SSA $\pi^+, \pi^-, \pi^0, \rho, \dots$ GPD-Amplitudes Semi-Incl. SSA $\pi^+, \pi^-, \pi^0, \rho, \Lambda \uparrow \dots$ $\delta q, H_1^{\perp}$	Excl. SSA $\pi^+, \pi^-, \pi^0, \rho, \dots$ GPD-Amplitudes	Inclusive • e: Cross section ratios Inclusive Λ Pol. Semi-Inclusive • Fragm. Functions • Nuclear effects
High polarization $P_B \sim 0.55$	Inclusive DSA $A_2 \Rightarrow g_2$ Sum rules, HT	Semi-inclusive DSA $\Delta s, \Delta u_{\text{bar}} - \Delta d_{\text{bar}}$ Hadron pairs $\Rightarrow \Delta G$	Exclusive • Coherence length • Color transparency
High polarization $P_B \sim 0.55$ + Helicity balanced			Exclusive • DVCS Semi-Inclusive • $\Lambda \Rightarrow \Delta s$
Charge balanced High polarization $P_B \sim 0.55$ + Helicity balanced			Exclusive • DVCS

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Charge balanced High polarization $P_B \sim 0.55$ + Helicity balanced			Exclusive • DVCS with recoil detector

to low polarization

to low integrated lumi

What is needed 2005-2007



remove polarized target

⇒ **run with recoil detector to measure exclusive reactions**

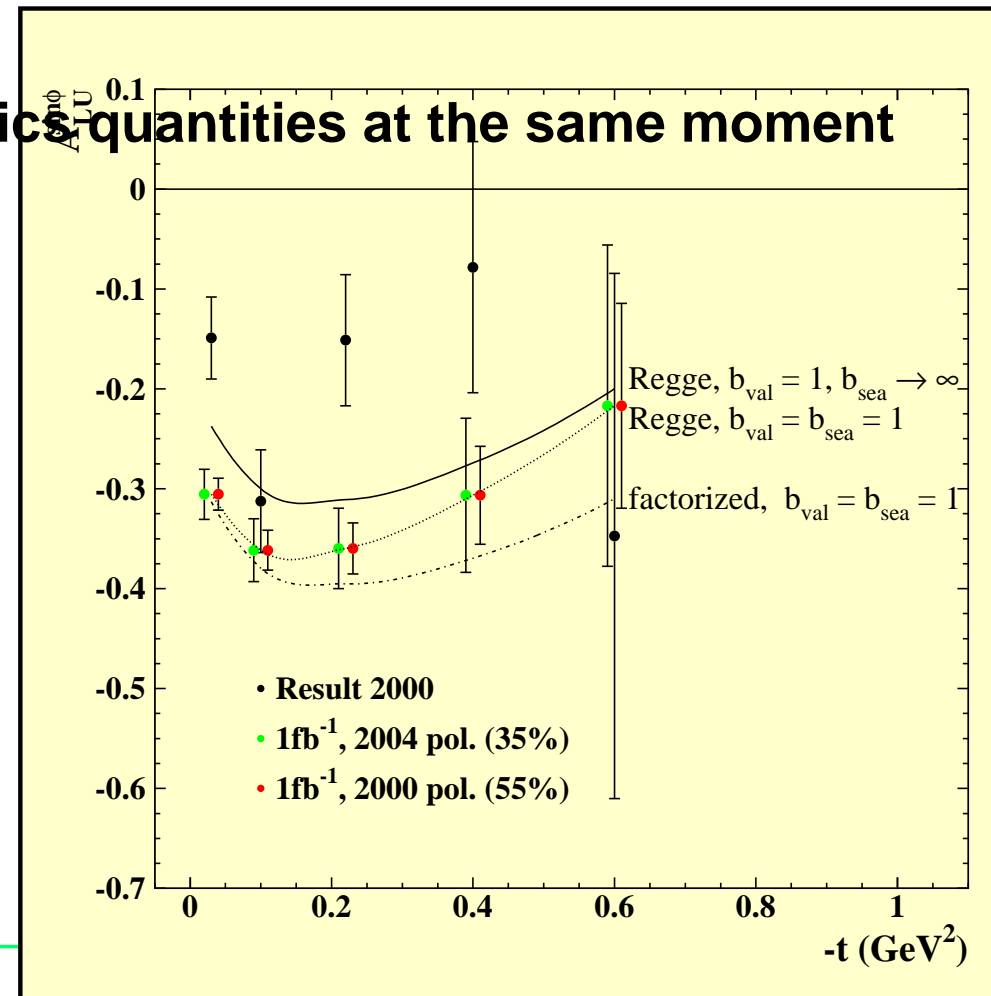
⇒ **orbital angular momentum of quarks**

What is needed 2005-2007

- remove polarized target
 - ⇒ run with recoil detector to measure exclusive reactions
 - ⇒ orbital angular momentum of quarks
- $\langle P \rangle$ 55% ⇒ 35% ⇒ factor 0.65 in FoM for DVCS

Results compatible to 2000

⇒ But need to bin in several kinematics quantities at the same moment



What is needed 2005-2007

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- requirements on systematic error $< 2\%$

