

# JAM: Moving forwards

P. Jimenez-Delgado



# Database status

- ▶ Collection of DIS data completed

Jefferson Lab  
EXPLORING THE NATURE OF MATTER

DEVELOPMENT - staging on MISVMW6

Login

ENERGY

MENU:  
Experiments

### JAM db - Experiments

Experiment	Description
COMPASS	A1p, A1d, g1p, g1d
EMC	A1p, g1p
HERMES	A_par_p, A_par_d, A1n
JLab Hall A (E01-012)	A_pac, g1, A1 on $^3\text{He}$ , partial integral gamma1 for $^3\text{He}$ and neutron.
JLab Hall A (E97-103)	A_long, A_perp, g1, g2 for neutron and $^3\text{He}$
JLab Hall A E99-117	A_long, A_perp, A1, A2, g1F1, g2F1, g1, g2 on $^3\text{He}$ , A1, A2, g1F1, g2F2, g1, g2 on neutron.
JLab Hall B (EG13)	A1d, A1p
SLAC E142	A1_3He, A2_3He, g1_3He, g2_3He
SLAC E143E155x	A_perp, A1, g1 on proton, deuteron
SLAC E154	A_pac, A_perp on $^3\text{He}$
SLAC E80E130	A_long_p
SMC	CERN-NA-047: Final results of measurements of the virtual photon asymmetry A1p and the spin-dependent structure function G1p in deep-inelastic scattering of 100 GeV and 190 GeV polarised muons on polarised protons. The data supersede all such previous measurements from SMC and are combined from the ammonia and deuterated butanol target. The data cover the kinematic range of x from 0.0008 to 0.7 and Q <sup>2</sup> from 0.2 to 100 GeV <sup>2</sup> .
Test Experiment	This is just for testing. <a href="http://www.google.com">http://www.google.com</a>

12000 Jefferson Avenue, Newport News, VA 23606  
Phone: (757) 269-5822

Privacy and Security Notice

[contact.helpdesk@jlab.org](mailto:contact.helpdesk@jlab.org)

- ▶ Next steps: inclusion of SIDIS (and eventually RHIC) data
- ▶ Details of errors still need to be dug out (normalizations, corr. vs uncorr., etc.)

# Error treatment

Least-squares estimator (as in appendix of PJD, PLB714(2012)301):

$$\chi^2 = \sum_{i=1}^N \frac{1}{\Delta_i^2} \left( D_i + \sum_{j=1}^M r_j \Delta_{ji} - T_i \right)^2 + \sum_{j=1}^M r_j^2$$

$$r_j = - \sum_{k=1}^M A_{jk}^{-1} B_k, \quad B_j = \sum_{i=1}^N \Delta_{ji} \frac{D_i - T_i}{\Delta_i^2}, \quad A_{jk} = \delta_{jk}^K + \sum_{i=1}^N \frac{\Delta_{ji} \Delta_{ki}}{\Delta_i^2}$$

$\Delta_i$  are uncorrelated errors (statistical and systematic)

$\Delta_{ij}$  correlated ones

$r_j$  systematic shifts

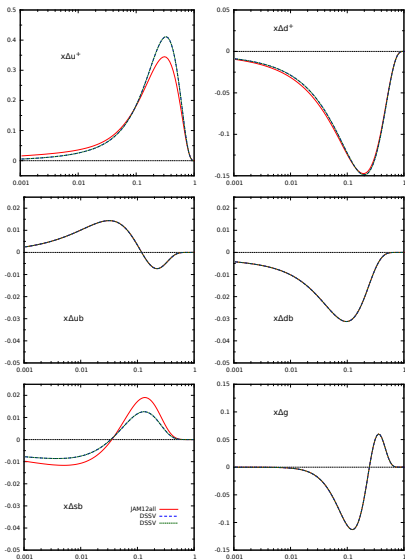
Iterative procedure with rescaling for multiplicative errors (avoids biases):

$$\delta \equiv \frac{\Delta}{D}; \quad \Delta_{ji} = \delta_{ji} T_i, \quad \Delta_i^2 = \delta_{stat,i}^2 D_i^2 + \delta_{unc,i} T_i^2$$

# Analysis status

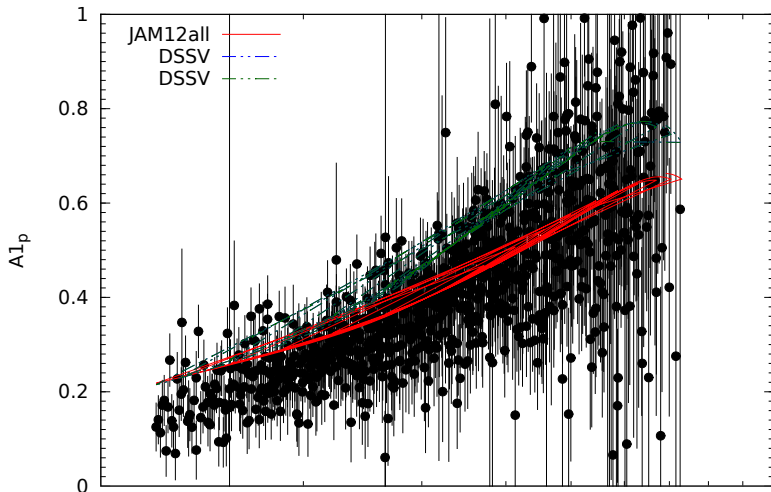
- ▶ Basic analysis framework (leading twist without any further corrections) for DIS data developed
- ▶ Target-mass corrections, higher-twist and nuclear corrections on the way (will be ready soon)
- ▶ Some (very preliminary) studies of  $\Delta u^+$ ,  $\Delta d^+$ ,  $\Delta s^+$  (present data do not constrain  $\Delta \bar{u}$ ,  $\Delta \bar{d}$ ,  $\Delta s^-$ ,  $\Delta g$ ) already carried out (come in a minute)
- ▶ Future directions open for discussion

# Some preliminary results: All data

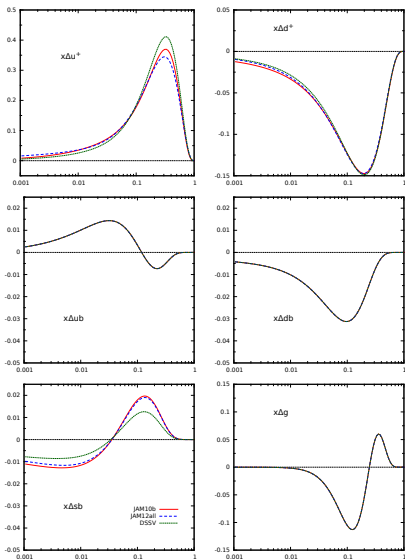


# Some preliminary results: All data

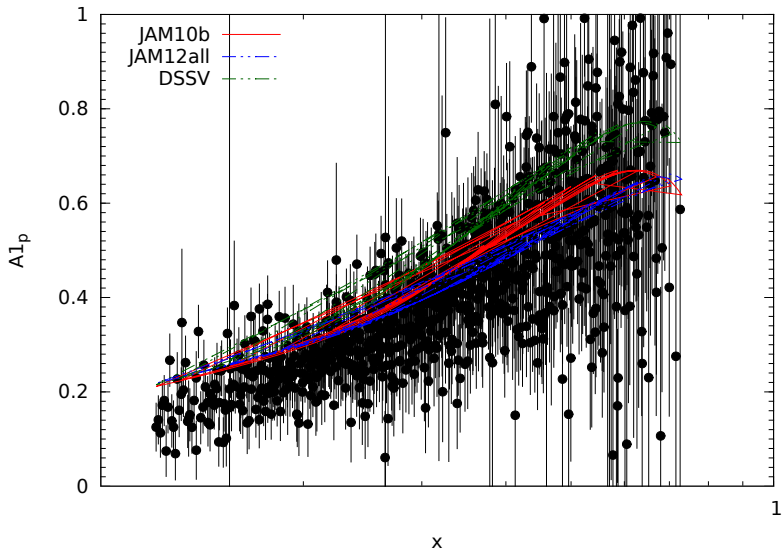
Larger  $\chi^2$  decrease ( $2 \rightarrow 1$ ) for JLab Hall B proton data:



# Some preliminary results: without JLab Hall B data

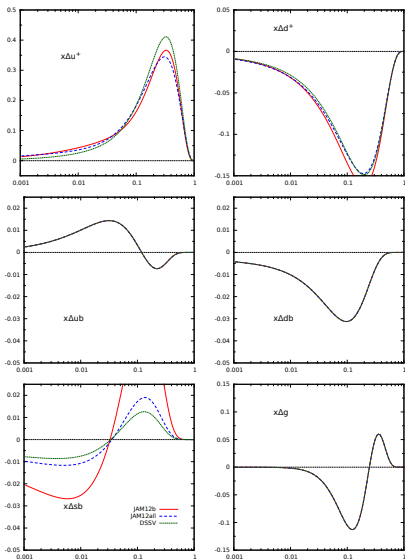


# Some preliminary results: without JLab Hall B data

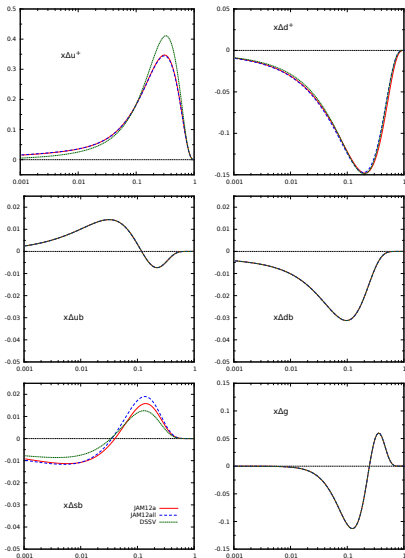




# Some preliminary results: without JLab Hall B data



# Some preliminary results: without JLab Hall A data



# Conclusions and outlook

- ▶ Things are indeed moving forwards
- ▶ We need to concentrate on particular studies we can do now (ideas welcome),
- ▶ while moving towards a global analysis (SIDIS and eventually RHIC data)