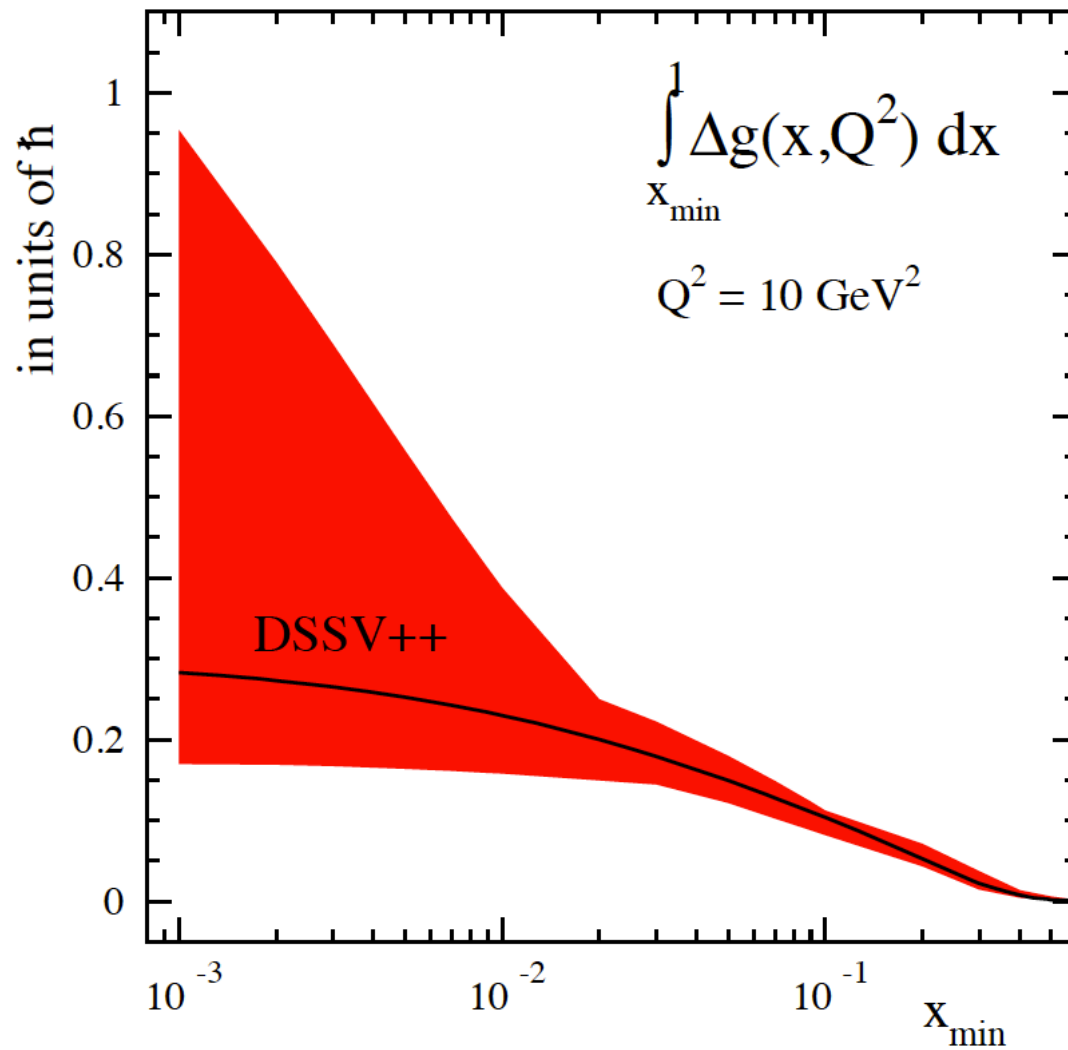


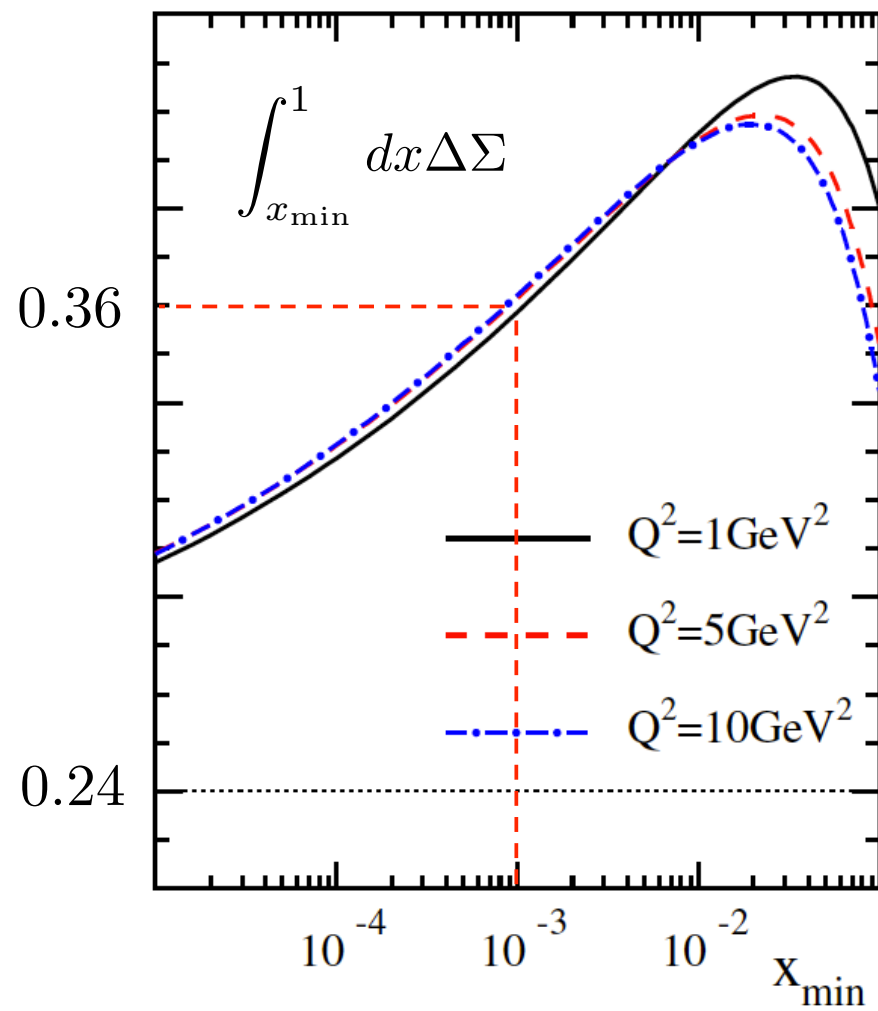
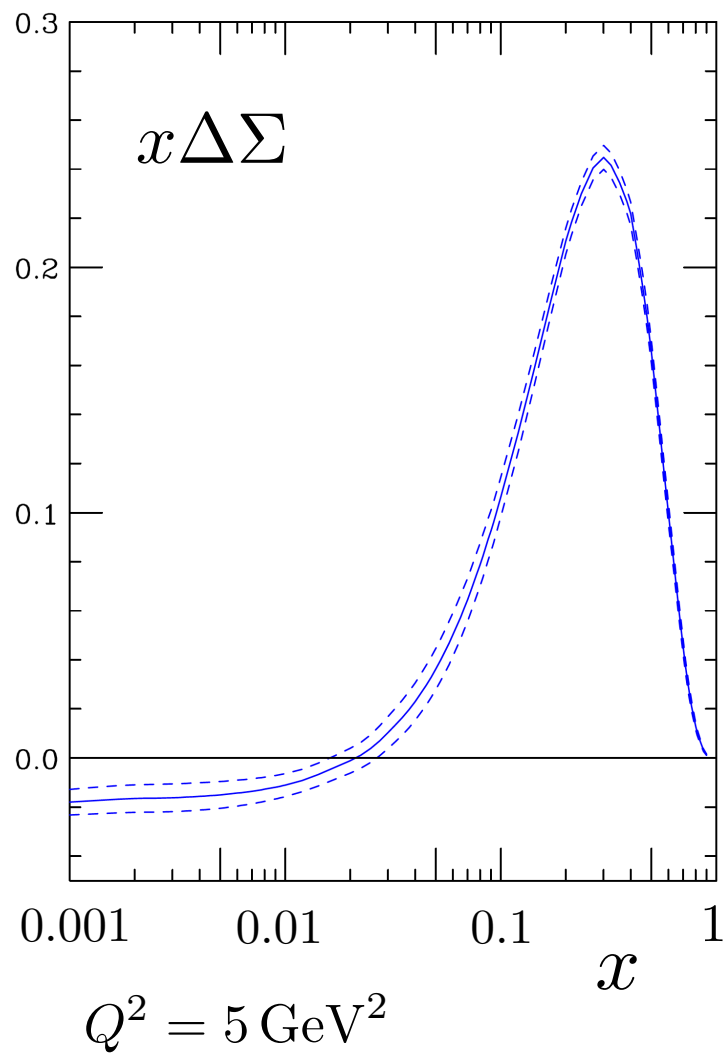
A few remarks on helicity structure & sum rule

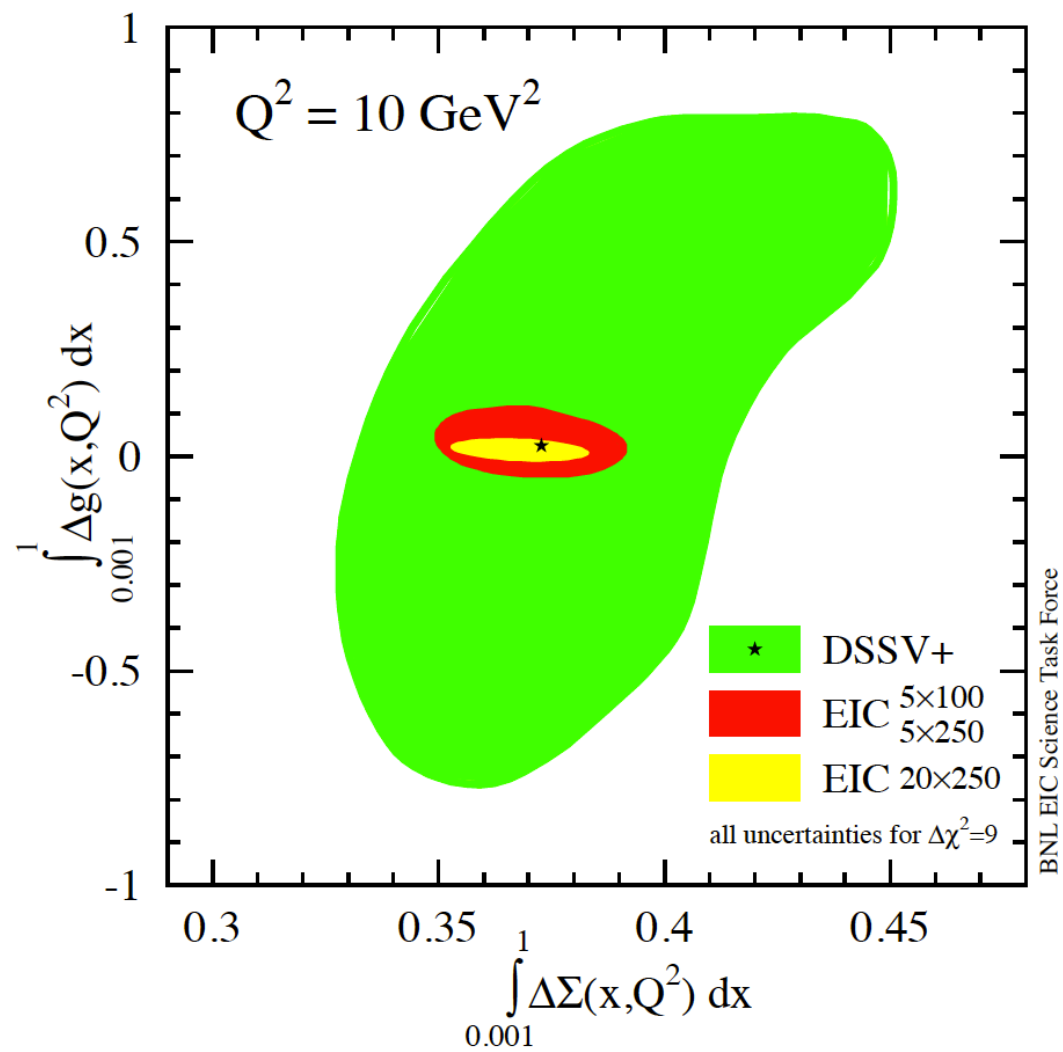
Werner Vogelsang, with input from Marco Stratmann

- without EIC, we'll never have a good quantitative knowledge about proton "spin sum rule"

$$\frac{1}{2} = \frac{1}{2}\Delta\Sigma + L_q + \Delta G + L_g$$







- spin contributions are
“quotable properties of the nucleon”
→ textbook material
- (also, HERA’s $F_2(x, Q^2)$ is shown in virtually all particle physics textbooks)
- captures people’s attention !

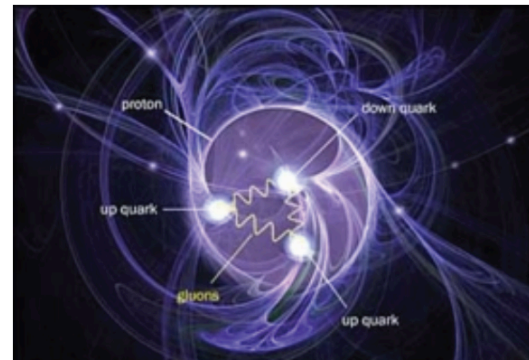


Proton Spin Mystery Gains a New Clue

Physicists long assumed a proton's spin came from its three constituent quarks. New measurements suggest particles called gluons make a significant contribution

Jul 21, 2014 | By [Clara Moskowitz](#)

Protons have a constant spin that is an intrinsic particle property like mass or charge. Yet where this spin comes from is such a mystery it's dubbed the "proton spin crisis." Initially physicists thought a proton's spin was the sum of the spins of its three constituent quarks. But a 1987 experiment showed that quarks can account for only a small portion of a proton's spin,



Plus, numerous other journals & newspapers...

Mystery of 'proton spin' solved? Particle collider reveals that quarks AND gluons may hold answer to great subatomic puzzle

- Researchers using a collider in New York say they have solved 'spin' mystery
- Since an experiment in 1987 the origins of proton spin have been unknown
- It had once been thought to be cause exclusively by quarks
- But this was proved to be wrong in the failed experiment 27 years ago
- Now a new study says gluons play an important role in proton spin
- Could bring to a close one of the greatest mysteries of subatomic physics

By [JONATHAN O'CALLAGHAN](#)

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- can be communicated (Elke: “...and is often the only thing people are familiar with in spin physics”)
- (nucleon tomography would have similar impact)

Combination EIC & lattice could give golden era !

- mutual complementarity?
- insights towards better understanding of QCD?
- make sure that lattice isn't simply viewed as “cheaper option” ;)