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Small- x Helicity Phenomenology¹ DANIEL ADAMIAK, YURI KOVCHEGOV, Ohio State University, WALLY MELNITCHOUK, Jefferson Lab, DANIEL PITONYAK, Lebanon Valley College, NOBUO SATO, Jefferson Lab, MATTEW SIEVERT, University of Illinois at Urbana-Champaign — One of the key components to solving the proton spin problem is understanding the small- x asymptotics of the helicity parton distribution functions (hPDFs). Several years ago, novel, small- x evolution equations were derived using the shock-wave/Wilson line formalism, designed for calculating the x -dependence of the quark and gluon hPDFs and the proton g_1 structure function. These equations can be used to predict the contribution to the spin of the proton coming from the helicities of the small- x quarks and gluons. In this talk we will present the first-ever attempt to describe the world data on the g_1 structure function at small x using the evolution equations derived the novel evolution equations within the JAM global analysis framework. Our results serve as a prediction for future measurements at the EIC and can be used to estimate the net amount of quark spin at small- x , ultimately bringing us one step closer to understanding the proton spin.

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