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Transversity in inclusive DIS and novel TMD sum rules

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A new collinear factorization analysis of inclusive DIS scattering with suitable non-perturbative "jet correlators"shows that a novel, non perturbative spin-flip term associated with the invariant mass of the produced hadrons couples to the target's transversity distribution function. In inclusive cross sections, this provides an hitherto neglected and large contribution to the twist-3 part of the g2 structure function, that can explain the discrepancy between recent calculations and fits of this quantity. It also provides an extension of the Burkhardt-Cottingham sum rule, now featuring an interplay between the g2 and h1 functions that calls for a re-examination of their small-x behavior; likewise it provides an extension of the Efremov-Teryaev-Leader sum rule, suggesting a novel way to measure the tensor charge of the proton. As part of the calculation leading to these results, but interesting in their own right, novel TMD sum rules are derived.

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