

UCLA NUCLEAR PHYSICS SEMINAR

The origin of single transverse-spin asymmetries in high-energy collisions

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We present, for the first time, a phenomenological analysis that demonstrates all single transverse-spin asymmetries (SSAs) in high-energy collisions have a common origin. Namely, they are due to the intrinsic quantum-mechanical interference between single- and multi-parton states. We perform the first global fit of data from Semi-Inclusive Deep Inelastic Scattering, Drell-Yan, $e+e-$ annihilation into hadron pairs, and proton-proton collisions. Consequently, we are able to identify a unique set of functions that describes all observed SSAs. Furthermore, we achieve the first phenomenological agreement with lattice on the tensor charge of the nucleon.

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