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Spin Orbit Correlations M. BURKHARDT, New Mexico State University

I discuss the physical interpretation for generalized parton distributions (GPDs) with special focus on those GPDs that describe parton asymmetries in impact parameter space. The chirally even GPD $E(x, 0, -\Delta_{\perp}^2)$ describes the transverse deformation of the distribution of unpolarized quarks in a transversely polarized nucleon. In combination with an attractive final state interaction (FSI) this deformation can explain the Sivers effect in SIDIS. The chirally odd GPD $\bar{E}_T(x, 0, -\Delta_{\perp}^2)$ describes the deformation of the distribution of transversely polarized quarks in an unpolarized target. I will explain the

physics associated with the sign of \bar{E}_T and its implications for measurements of the Boer-Mulders function.