

Back-to-back SIDIS

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In semi-inclusive deep inelastic scattering (SIDIS), when a second hadron produced from the target remnant is detected in coincidence with the primary hadron produced in the current an entire suite of new transverse-momentum dependent (TMD) observables becomes accessible. These observables are known as fracture functions and can be linked to each of the more well known TMDs, such as the helicity or transversity distributions, through momentum sum rules. Simultaneously, they can provide leading-twist access to objects whose interpretation are not accessible in traditional SIDIS, such as the leading twist beam- and target-spin asymmetries which are sensitive to fracture functions describing longitudinally polarized quarks in an unpolarized nucleus and vice versa. Interestingly, in addition to these possibilities, the detection of the second hadron in coincidence with the first also provides the opportunity to cleanly remove the contributions of non-factorizable diffractive vector-meson production which strengthens the interpretation of the back-to-back SIDIS results. These features will all be briefly highlighted.

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