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Multidimensional partial wave analysis of SIDIS dihadron beam spin asymmetries at CLAS12

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Dihadron beam spin asymmetries provide a wide range of insights into nucleon structure and hadronization. Recent measurements at CLAS12 provide the first empirical evidence of a nonzero $G_1^{\perp}$, the parton helicity-dependent dihadron fragmentation function (DiFF) encoding spin-momentum correlations in hadronization. These measurements also allow for a point-by-point extraction of the subleading-twist PDF $e(x)$ in a collinear framework. We observe different behavior of the asymmetries in different invariant mass regions, motivating a fully multidimensional study. The DiFFs also expand in terms of partial waves, each corresponding to the interference of dihadrons of particular polarizations. Moreover, the rapidity dependence of the asymmetry may help explore biases from the current and target fragmentation regions. Altogether a fully multidimensional partial wave analysis is needed, and this presentation will summarize the efforts and results obtained thus far.

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