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First insight into TMD fragmentation physics at photon-photon colliders

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In this contribution, we suggest to consider photon-photon scattering as a useful source of information on transverse-momentum-dependent fragmentation functions (TMD FFs), complementing SIDIS and e+e- annihilation processes, which provide most of the present phenomenological information on TMD FFs. As a first illustrative example, we study two-hadron azimuthal asymmetries around the jet thrust axis in processes where, in a circular lepton collider one tagged, deeply virtual photon scatters off an untagged quasireal photon, both originating from the initial lepton beams, producing inclusively an almost back-to-back light-hadron pair with large transverse momentum, in the gamma-gamma center-of-mass frame. Similar processes, in a more complicated environment due to the presence of initial hadronic states, can also be studied in ultraperipheral collisions at the LHC and the planned future hadron colliders.

Reference paper:
S. Anedda, F. Murgia, C. Pisano, Phys. Rev. D 112, 014013 (2025)

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