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The nucleon's transversity and the photon's distribution amplitude probed in lepton pair photoproduction

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We describe a new way to access the chiral odd transversity parton distribution in the proton through the photoproduction of lepton pairs. The basic ingredient is the interference of the usual Bethe Heitler or Drell-Yan amplitudes with the amplitude of a process, where the photon couples to quarks through its chiral-odd distribution amplitude, which is normalized to the magnetic susceptibility of the QCD vacuum. A phenomenology of single and double spin observables emerges from the unusual features of this amplitude (Phys.Rev.Lett.103:072002,2009).

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