Contribution ID: **24**                                    Type: **not specified**

# Factorization of ep diffraction

*Friday, 31 May 2024 10:00 (30 minutes)*

Diffractive processes are events with large rapidity gaps, which typically comprise a double-digit percent of events at colliders and are important for small-$x$ physics. We present a comprehensive factorization of $ep$ diffraction, using effective field theory. We show that there are four nontrivial unpolarized diffractive structure functions at leading power, including the conventional $F_2^D$ and $F_L^D$, as well as two large less-studied structures. We compare and contrast the factorization with traditional choices for global fits, including Collins'hard-scattering formula with diffractive PDFs (dPDFs) and the Ingelman-Schlein model. We provide model-independent perturbative predictions for ratios of structure functions, for both coherent and incoherent diffraction. For the incoherent case, these predictions hold regardless of how many color channels contribute, and hence can be tested experimentally, even if it is difficult to isolate pure color-singlet exchange.

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**Session Classification:**   Friday