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Wilson-line geometries and the relation between IR singularities of form factors and the large-x limit of DGLAP splitting functions

Tuesday 10 September 2019 15:00 (25 minutes)

We discuss the relation between the infrared singularities of on-shell partonic form factors and parton distribution functions (PDFs) near the elastic limit, through their factorisation in terms of Wilson-line correlators. Ultimately we identify the difference between the anomalous dimension controlling single poles of these two quantities to all loops in terms of the closed parallelogram Wilson loop. To arrive at this result we first use the common hard-collinear behaviour of the two to derive a relation between their respective non-collinear soft singularities, and then show that the latter is manifested in terms of differing Wilson-line geometries. We use explicit diagrammatic calculations in configuration space through two loops to verify the relation. More generally, the emerging picture allows us to classify collinear singularities in eikonal quantities depending on whether they are associated with finite (closed) Wilson-line segments or infinite (open) ones.

Primary authors: MILLOY, Calum (University of Edinburgh); GARDI, Einan; FALCIONI, Giulio

Presenter: MILLOY, Calum (University of Edinburgh)

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