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Exploring the nucleon structure: fragmentation functions from e^+e^- annihilation experiment

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The understanding of the fundamental constituent of nucleons and the internal parton dynamics is one of main goal in modern physics. However, the description of the nucleon structure in the Quantum Chromodynamics (QCD) remains one of the most outstanding challenges in modern high energy and particle physics. Parton distribution and fragmentation functions are used to describe the distribution of partons in the nucleon and the formation of colourless hadrons starting from a coloured partonic initial state, respectively. They are non-perturbative functions which cannot be derived from first principle but for which experimental input are needed. In the last decades, a strong interest has risen about the transverse momentum dependent (TMD) functions, which can be used as a tools to investigate the 3D-structure of nucleons. In this talk we will report a review of the existing data on fragmentation function related measurements from e^+e^- annihilation experiments used for the extraction of parton distributions functions. The aim is to highlight what are the actual limit, what is needed for a better understanding of nucleon structure and the possibilities offered by nucleon-nucleon experiments.

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