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**Flavor decomposition and extraction of quark and gluon polarizations**

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Initially experiments accessed the polarized nucleon structure mostly via inclusive deep inelastic lepton-nucleon scattering (DIS) from SLAC to CERN, DESY and JLAB. While carried out with great success, the extracted flavor information is limited to applying iso-spin symmetry to different nucleons and evolution. In semi-inclusive DIS (SIDIS), where one detects an additional hadron in the final state, one becomes sensitive to the flavor of the struck parton via fragmentation functions. At first this became possible for unidentified hadrons in SMC, before HERMES and COMPASS measured the helicity quark distribution functions in great detail. The necessary fragmentation functions were predominantly obtained from LEP experiments, while nowadays also SIDIS data and soon B-factory data will be used. Two aspects cannot be accessed as easily in present-day SIDIS, however. The gluon helicity distribution is not directly accessible in the dominant processes. This function is therefore being measured at RHIC by PHENIX and STAR where high energetic interactions are dominated by gluons. Also here, one makes use of fragmentation functions or measures jet observables. The other aspect still poorly determined is the sea quark helicity distribution, which, apart from ongoing and future SIDIS measurements, is being accessed in a new way in real W boson production. The charge of the W nearly fixes the flavor of the participating partons while the parity violation of the weak interaction fixes their helicity. One can therefore obtain information on the light sea and valence quark distributions at high scale. Initially each experiment extracted polarized, flavor separated quark distribution functions for their own data. Nowadays global analysis frameworks such as most recently DSSV and DSS extract the different parton flavor helicity distribution functions and unpolarized fragmentation functions of the world data. In order to access the transverse spin structure of the nucleon, unpolarized and polarized fragmentation functions are essential. Also here the fragmentation functions allow to extract flavor dependent information. However, so far the data is still limited and several theoretical aspects not completely settled between different processes, such that only early attempts at a global analysis have been made using SIDIS and Belle results. An overview of the different aspects of extracting flavor dependent information of the nucleon structure, its status and future measurements will be presented.