

Probing the gluonic structure of pions with tagged DIS (TDIS)

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Tagged-DIS (TDIS) provides a unique opportunity to study the structure of targets which are not readily available. One can study the longitudinal pion structure in a semi-inclusive measurement by measuring the leading neutrons in the far forward direction in addition to the scattered electron in the usual DIS. Theoretically, in the so-called Sullivan process, the cross section in these events is given as a product of a chiral splitting function (proton to neutron + pion) and the structure function of the (nearly on-shell) exchanged pion. We performed a phenomenological study of the predictions of dipole models in leading neutron DIS at high energy. Our investigations hint toward a universal longitudinal structure of pions and protons at high energy. On the other hand, extending the study to exclusive vector meson production with leading neutrons provides the pathway to investigate the spatial extent of the pion cloud and gluon distribution of pions.

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