Twist-3 Mechnism for Single Spin Asymmetry Reexamined YUJI
KOIKE, Niigata University, KAZUHIRO TANAKA, Juntendo University — In the
framework of the collinear factorization, single transverse spin asymmety (SSA) is
a twist-3 observable which represents quark-gluon correlations in a hadron. In this
talk, we present a lightcone-gauge calculation of SSA for the direct-photon produc-
tion in the pp collision which is relevant for the RHIC-SPIN program. Some time
ago, Qiu and Sterman presented a Feynman-gauge calculation for the quantity. The
derivation of the cross section for SSA involves identification of the pole contribution
in the Feynmann diagram, and expressing SSA in terms of gauge invariant corre-
lation functions is quite involved. So it is interesting to reexamine the result in a
different gauge. After identifying the relation between different representations of
the twist-3 distribution functions for the transversely polarized nucleon, we show
how each pole contribution can be identified and expressed in terms of the gauge
invariant functions in the lightcone gauge.

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Date submitted: 25 May 2005   Electronic form version 1.4