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Forward production of Drell-Yan dileptons at high energies and low dilepton invariant masses in a k_t-factorization approach: Do we see onset of saturation?

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We discuss Drell-Yan production of dileptons at high energies
in forward rapidity region in a hybrid high-energy approach
which uses unintegrated gluon distributions in one proton and collinear
quark/antiquark distributions in the second proton.
Corresponding momentum-space formula for the differential cross sections
in high-energy approximation has been derived and will be presented.
The relation to the commonly used dipole approach is discussed.
We conclude and illustrate that some results of the dipole approaches
are too approximate, as far as kinemtics is considered, and in fact
cannot be used when comparing with real experimental data.
We find that the dipole formula is valid only in very forward/backward
rapidity regions ($|y| > 5$) that cannot be studied experimentally
in the moment.
We performed calculations of some differential cross sections for
low-mass dilepton production by the LHCb and ATLAS collaborations.
In distinction to most dipole approaches, we include all the four
Drell-Yan structure functions, although the impact of interference
structure functions is rather small for the relevant experimental
cuts.
We find that both side contributions ($gq/\bar{q}$ and $q/\bar{q}g$)
have to be included even for the LHCb rapidity coverage which
is in contradiction with what is usually done in the dipole approach.
We present results for different unintegrated gluon distributions from
the literature (some of them include saturation effects).
We see no clear hints of saturation even at small M_{ll}
when comparing with the LHCb data.
The presentation will be based on our upcoming paper [1].

[1]
W. Sch\"afer and A. Szczurek, a paper in preparation, to appear 02/16.

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