



Contribution ID: 121

Type: **Theory**

Searching for intrinsic charm inside the proton at the LHC

Searching for the intrinsic heavy quark component in the proton suggested in [1] was proposed recently in the forward charmed meson production in pp collisions at the LHC [2]. We extend this study to the inclusive LHC pp-production of c(b)-jets accompanied by photons. It is stimulated by the $D\phi$ and CDF results for the production of prompt photons and c(b)-jets in $p\bar{p}$ collisions at the TEVATRON, where an indication of the possible contribution of the intrinsic charm in the proton was observed [3, 4, 5, 6]. In particular, a possibility to study the intrinsic charm and bottom contributions to processes like pp !

+ c(b) + X is discussed. Some

promising theoretical expectations for these processes are given, which could be searched for and verified at the LHC in pp-collisions at $\sqrt{s} = 7-14$ TeV. We show that the ratio of pT spectra of prompt photons produced in the hard process pp ! +c(jet)+X at $\sqrt{s} = 8$ TeV with and without the intrinsic charm contribution can be about 250%-400% at high transverse momenta $p_T > 200$ GeV/c of the photon.

References

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Track Classification: Poster