Contribution ID: **64** Type: **On-site planned, but remote also possible**

Towards modeling of tWGamma at NLO

The electroweak couplings of the heaviest known particle, the top quark, has recently gained much attention because of their important role in connection with physics beyond the standard model. Top quark interactions with photon and the Z boson can be directly accessed in the associated ttbar+ɣ/Z production. The measurement of these processes have entered the precision era during Run-II LHC where differential distributions are also measured in addition to the inclusive cross section. There is a non-negligible contribution of tW+ɣ/Z in such analyses, which if analyzed properly, sheds additional light to the picture of top-V interactions (V=ɣ/Z). Depending on the type of the new physics model, the contribution of tWV can become even more important. The main challenge of tWV is its quantum interference with ttV at NLO which calls for studies of the MC models. This has been less explored for tWɣ since photon is massless and the usual solutions work for massive cases. We would like to study, for the first time in CMS, the production of tWɣ at LO while considering an additional emission (i.e. LO+J). This is the first step towards including the next order of corrections in the modeling. Nevertheless, it will have an important impact on the ongoing ttɣ analysis in CMS. The study relies on the existing framework, knowledge and expertise in the group for tWZ.

Field

B1: Particle physics analysis (software-oriented)

DESY Place

Hamburg

DESY Division

FH

DESY Group

CMS

Special Qualifications:

Introductory knowledge of particle physics and basic computing skills are required. In particular, the student should know at least one programming language (e.g. C++ and/or python).

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