Contribution ID: **74**   Type: **not specified**

Two-Loop QCD Helicity Amplitudes for Higgs Production Associated with a Vector Boson through Bottom Quark Annihilation

Thursday 12 September 2019 15:30 (25 minutes)

Productions of the Higgs boson in association with a massive vector boson, i.e. the VH events, play an important role in the explorations of Higgs physics at the LHC, both for a precise study of Higgs' Standard Model couplings and for probing new physics. In this talk, we present the 2-loop massless QCD corrections to the helicity amplitudes of the associated Higgs production through the bottom quark-antiquark annihilation, which is a necessary ingredient to the full NNLO QCD corrections to this process in the 5-flavor (PDF) schemes. The computation is performed by projecting the 2-loop amplitudes onto an appropriate set of Lorentz structures, sufficient for deriving all physical helicity amplitudes, whose availability would later allow us to combine the VH production with the subsequent decay of the massive vector boson with full spin correlations accounted. The axial contributions are computed using Larin's prescription of the axial vertex (or gamma5), and the chiral Ward identities (or anomaly equations) of axial currents are verified. We provide the analytic expressions of the finite remainders of each helicity amplitudes in terms of polylogarithms of maximum weight four.

Authors: Dr AHMED, Taushif (Max-Planck-Institut für Physik); A. H., Ajjath (The Institute of Mathematical Sciences); Dr CHEN, Long (Max Planck Institute for Physics); Dr DHANI, Prasanna K. (INFN, Florence); MUKHER-JEE, Pooja (The Institute of Mathematical Sciences); Prof. RAVINDRAN, V. (The Institute of Mathematical Sciences)

Presenter: Dr AHMED, Taushif (Max-Planck-Institut für Physik)

Session Classification: Thursday Afternoon B