

Radiative corrections and threshold resummed predictions to pseudoscalar Higgs boson production

The Higgs boson's discovery has opened up a plethora of possibilities. Exploring these possibilities requires precise theoretical predictions within the SM and beyond (BSM) in conjunction with revolutionary experimental progress. First, I will discuss the current work state in the study of pseudoscalar Higgs boson production, followed by the computation of radiative corrections to di-pseudoscalar production via gluon fusion up to NNLO in the Effective Field Theory (EFT) framework. But these FO corrections become unstable in certain regions of phase space due to large logarithmic contributions arising from soft and/or collinear gluons. Resumming these large logs to all orders in perturbation theory can solve the problem. Consequently, I will discuss the resummation of Next-to-Soft Virtual (NSV) logarithms to two-loop order for the threshold production of a pseudoscalar Higgs boson through gluon fusion. I will discuss the phenomenological implications of the resummed results, theory uncertainties and the impact of QCD corrections on mixed scalar-pseudoscalar states.

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Session Classification: Poster session

Track Classification: QCD Physics