



Contribution ID: 114

Type: **not specified**

## Study of $H\gamma Z$ coupling using $e^+e^- \rightarrow \gamma H$ at the ILC

*Tuesday, 16 March 2021 06:40 (20 minutes)*

In the Standard Model (SM),  $H\gamma Z$  coupling is a loop induced coupling, therefore it might receive relatively large correction from Beyond Standard Model (BSM) physics. It is very challenging to measure at the HL-LHC, where only  $3\sigma$  significance is expected for branching ratio of  $H \rightarrow \gamma Z$ . On the other hand,  $H\gamma Z$  coupling is potentially very sensitive to new physics, for example some new heavy particles contributing to the loop, therefore it is interesting to know how well this coupling can be measured at the International Linear Collider (ILC). More over, it is found  $H\gamma Z$  coupling plays an important role in a framework of effective field theory, for example in  $e^+e^- \rightarrow ZH$  process it is necessary to know the contribution from s-channel with photon. It turns out that the anomalous  $H\gamma Z$ ,  $H\gamma\gamma$ ,  $HZZ$  and  $HWW$  couplings come from a few common set of dimension-6 operators, and  $H\gamma Z$  coupling measurement can provide very useful constraints on those operators.

In this talk, we will report the study of  $H\gamma Z$  coupling using production channel  $e^+e^- \rightarrow \gamma H$ , with preliminary results based on the full simulation of ILD using the multivariate data analysis. Results will be given for an integrated luminosity of  $2000 \text{ fb}^{-1}$  (final plan) at  $E_{CM}=250 \text{ GeV}$ .

### Time Zone

Asia/Pacific

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**Session Classification:** PD3: Physics Analyses

**Track Classification:** Physics and Detectors Tracks: PD3: Physics Analyses