

Title: *Electroweak processes in the framework of effective field theory*

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Abstract: *In this thesis, we study electroweak processes within the framework of effective field theory employing the approach of effective Lagrangians. We mainly focus on the decay process $H \rightarrow \gamma\gamma$. A complete set of $SU(2) \times U(1)$ invariant dimension-six operators is utilized. We present a brief introduction to GWS Standard model and dimension-six effective operators. One-loop Standard model contribution to the process of $H \rightarrow \gamma\gamma$ is then evaluated, followed by calculation of tree-level and one-loop level dimension-six operators contribution to the same process. We then present a brief general summary of renormalization procedure in quantum field theory. Renormalization of performed calculations is implemented, and possible issues that may arise during renormalization of such non-renormalizable theory are also discussed. In the end, we discuss the obtained results, mainly the dependence of $H \rightarrow \gamma\gamma$ decay rate on effective theory's free parameters and the scale of the new physics Λ . Focus is made on possible deviations from Standard model results. The results are plotted in charts.*

Keywords: *Effective field theory, Electroweak processes within extension of Standard model, Effective Lagrangians, Dimension 6 Lagrangians, $H \rightarrow \gamma\gamma$ decay in physics beyond Standard Model, renormalization on non-renormalizable theories.*