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## Higgs Production through Gluon Fusion via intermediate Top quark loop

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Beginning with a brief discussion on the spontaneous symmetry breaking of global and local symmetries, the amplitude for production of Higgs boson via the most dominant channel, i.e., gluon fusion, has been calculated. The expression for the amplitude in terms of general arbitrary top quark masses give rise to some dilogarithmic integrals, which can be difficult to evaluate, and hence, the limit when mass of top quark  $\gg$  mass of Higgs boson has been chosen. It is found out that even for cases in which the mass of the top quark is about 30% more than the mass of the Higgs boson, the integral remains almost insensitive to the mass of the top quark, i.e., with changing top quark mass, the value of the amplitude remains the same. This validates the calculations done in the selected limit.

**Apply to be considered for a student award (Yes / No)?**

Yes

**Level for award (Hons, MSc, PhD, N/A)?**

PhD

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