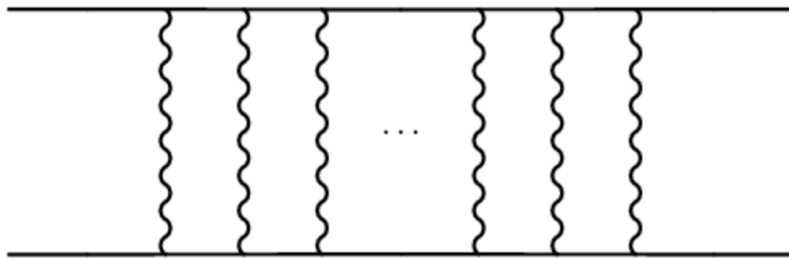


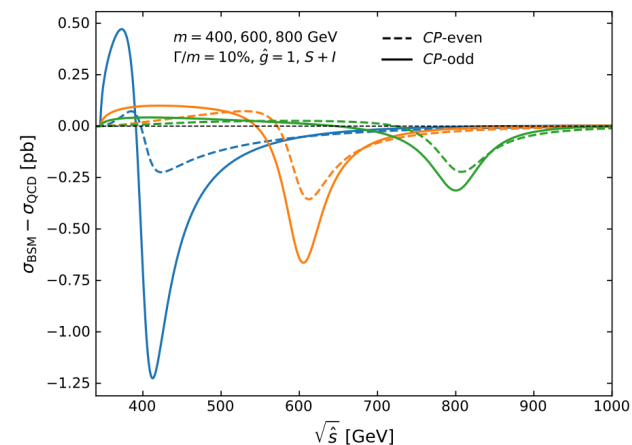
# $t\bar{t}$ Bound State vs Additional Higgs?

- Prediction of QCD
- Sommerfeld enhancement: summation of  $(\alpha_s/v)^n$



- Lowest-lying  $t\bar{t}$  states in s-wave:  $^1S_0, ^3S_1$  (pseudoscalar, vector)
- Production of scalar  $^3P_0$  suppressed

- Example: 2 Higgs doublet model
- 4 extra physical Higgses: neutral pseudoscalar, scalar, charged  $A, H, H^\pm$
- Expect interference with QCD background (peaks & dips)



Djouadi, JE, Popov & Quevillon, arXiv:1901.03417