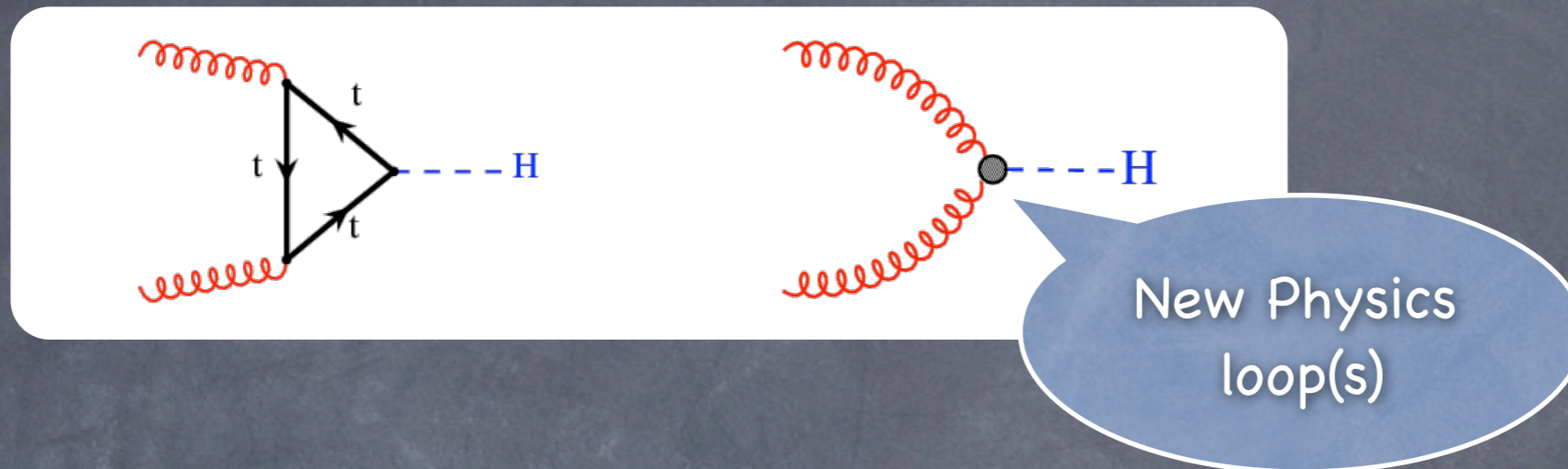


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- On-Peak, both top and New Physics contributions are insensitive to the mass scale in the loop.

$$\sigma_{gg \rightarrow h}^{\text{on-peak}} \sim |\kappa_t A_t(m_h^2) + \kappa_{gg} A_t(m_h^2)|^2$$

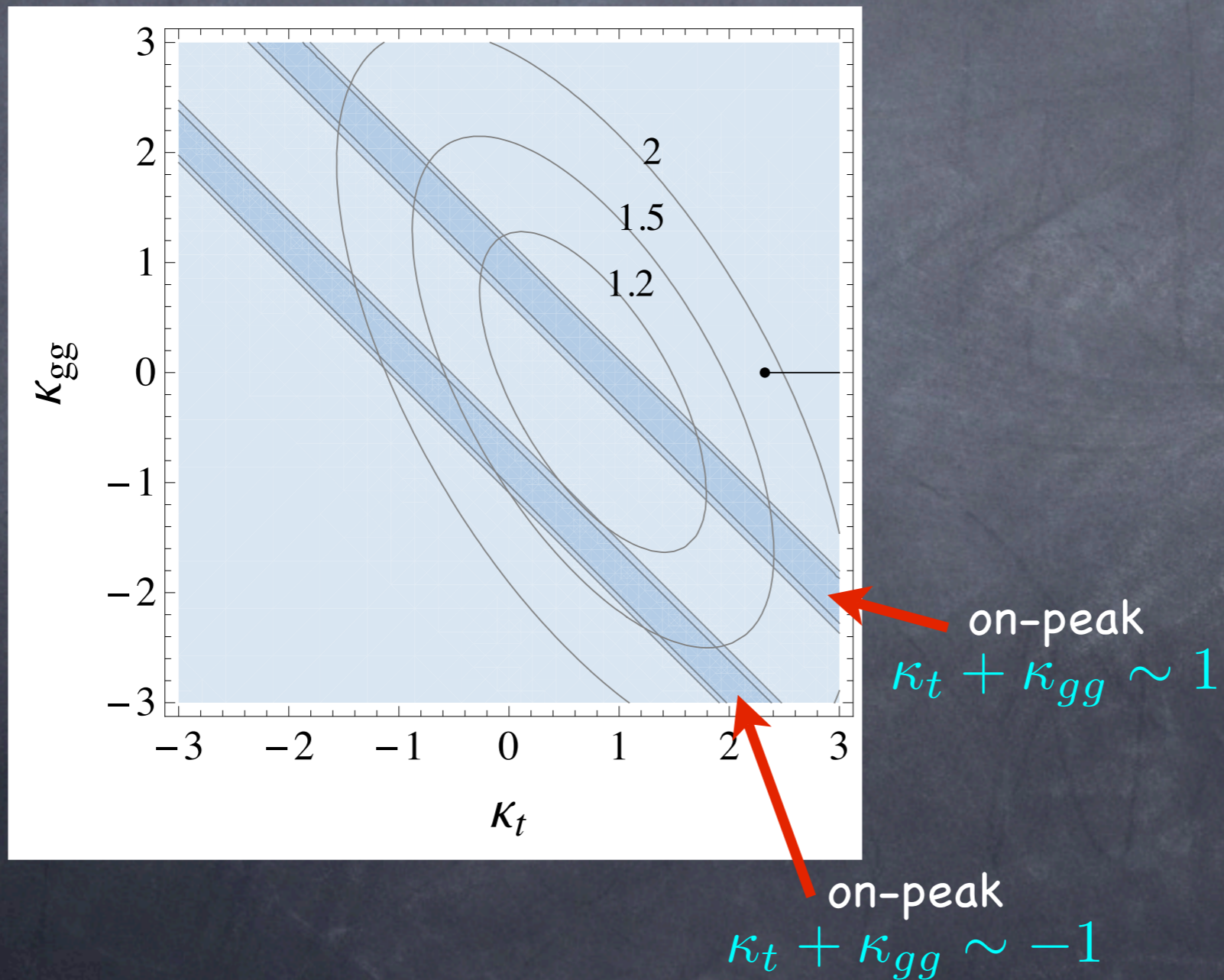
- Off-shell, above the $t\bar{t}$ threshold, the top loop is resolved!
- If the New Physics is heavy enough (0.5 - 1 TeV), the NPh loop may NOT be resolved.

$$\sigma_{gg \rightarrow h}^{\text{off-peak}}(\hat{s}) \sim |\kappa_t A_t(\hat{s}) + \kappa_{gg} A_t(m_h^2)|^2$$

$$\sigma_{gg \rightarrow h}^{\text{on-peak}} \sim |\kappa_t A_t(m_h^2) + \kappa_{gg} A_t(m_h^2)|^2$$

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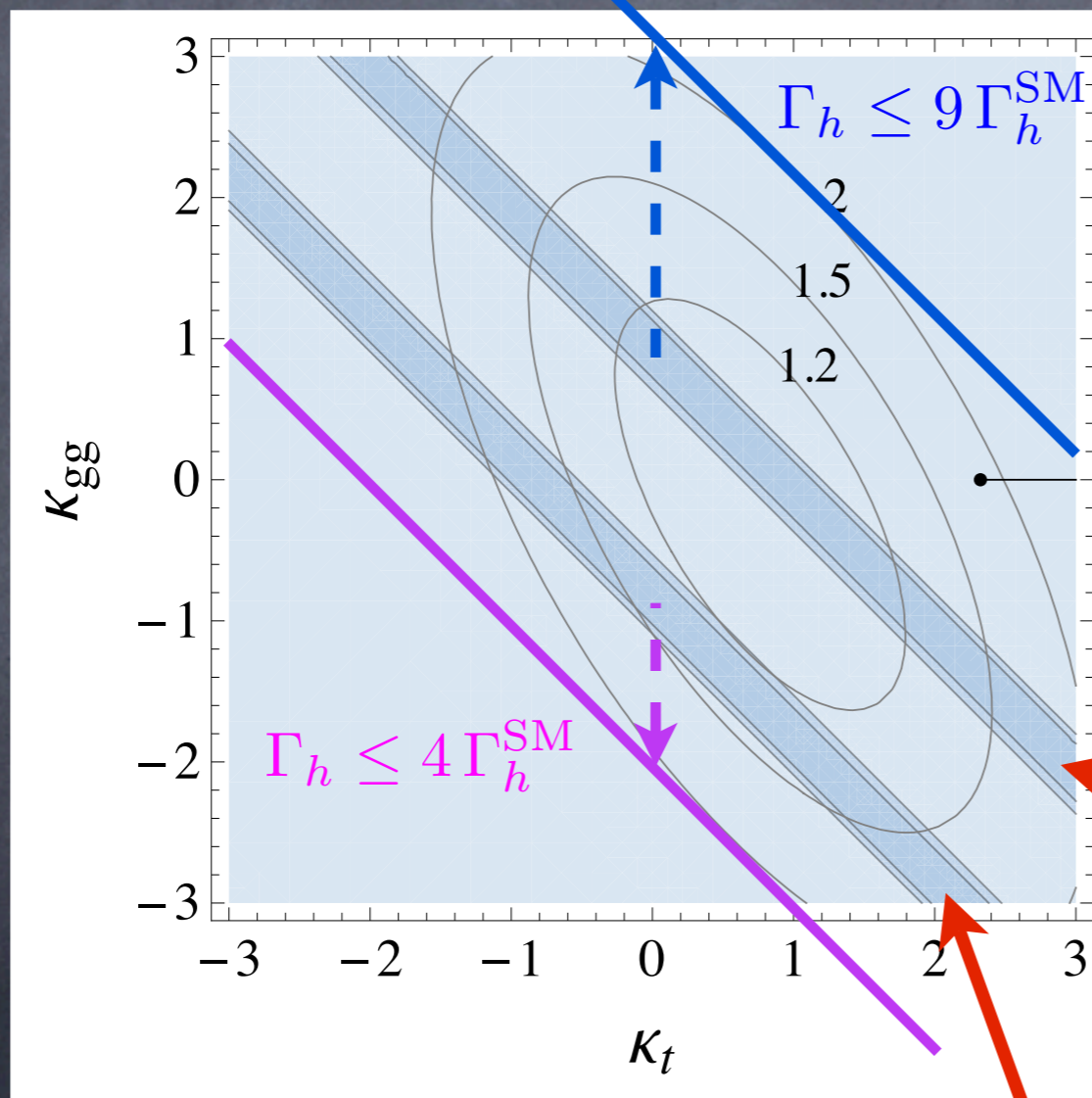
$$\sigma_{gg \rightarrow h}^{\text{off-peak}}(\hat{s}) \sim |\kappa_t A_t(\hat{s}) + \kappa_{gg} A_t(m_h^2)|^2$$



$$\sigma_{gg \rightarrow h}^{\text{on-peak}} \sim |\kappa_t A_t(m_h^2) + \kappa_{gg} A_t(m_h^2)|^2$$

$$\sigma_{gg \rightarrow h}^{\text{off-peak}}(\hat{s}) \sim |\kappa_t A_t(\hat{s}) + \kappa_{gg} A_t(m_h^2)|^2$$

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$\kappa'_s \leftrightarrow \Gamma_h$ degeneracy

$$\kappa_x \rightarrow \xi \kappa_x \quad \Gamma_h \rightarrow \xi^4 \Gamma_h$$

More solid bound
on the width!

on-peak
 $\kappa_t + \kappa_{gg} \sim 1$

on-peak
 $\kappa_t + \kappa_{gg} \sim -1$

To further validate:

- Verify the approximation of “heavy New Physics”: accuracy as a function of the NPh mass scale.

Fiducial cross-section
before the MELA discriminant.

