

PAUL SCHERRER INSTITUT

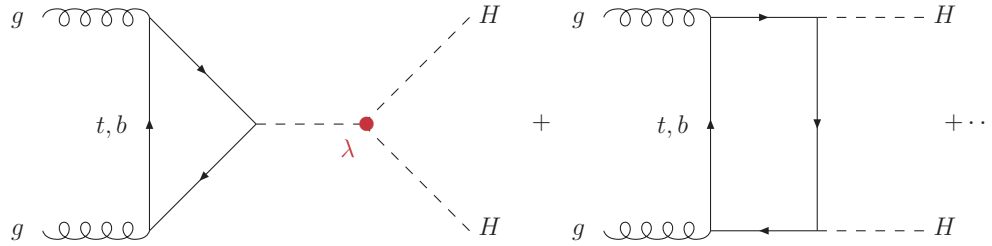


*TOP MASS EFFECTS IN
HIGGS PAIR PRODUCTION*

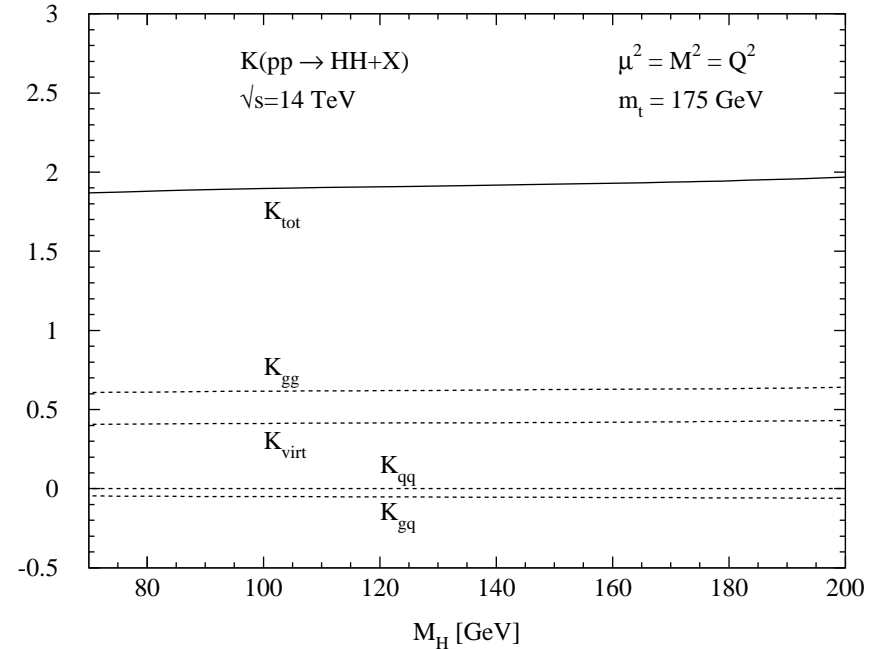
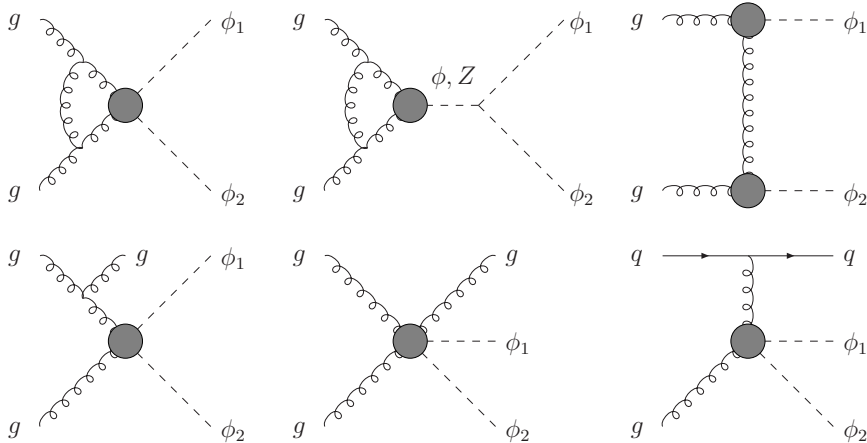
Michael Spira (PSI)

$gg \rightarrow HH$

SM



- third generation dominant $\rightarrow t, b$
- 2-loop QCD corrections: $\sim 90 - 100\%$
 $[M_H^2 \ll 4m_t^2, \quad \mu = M_{HH}]$

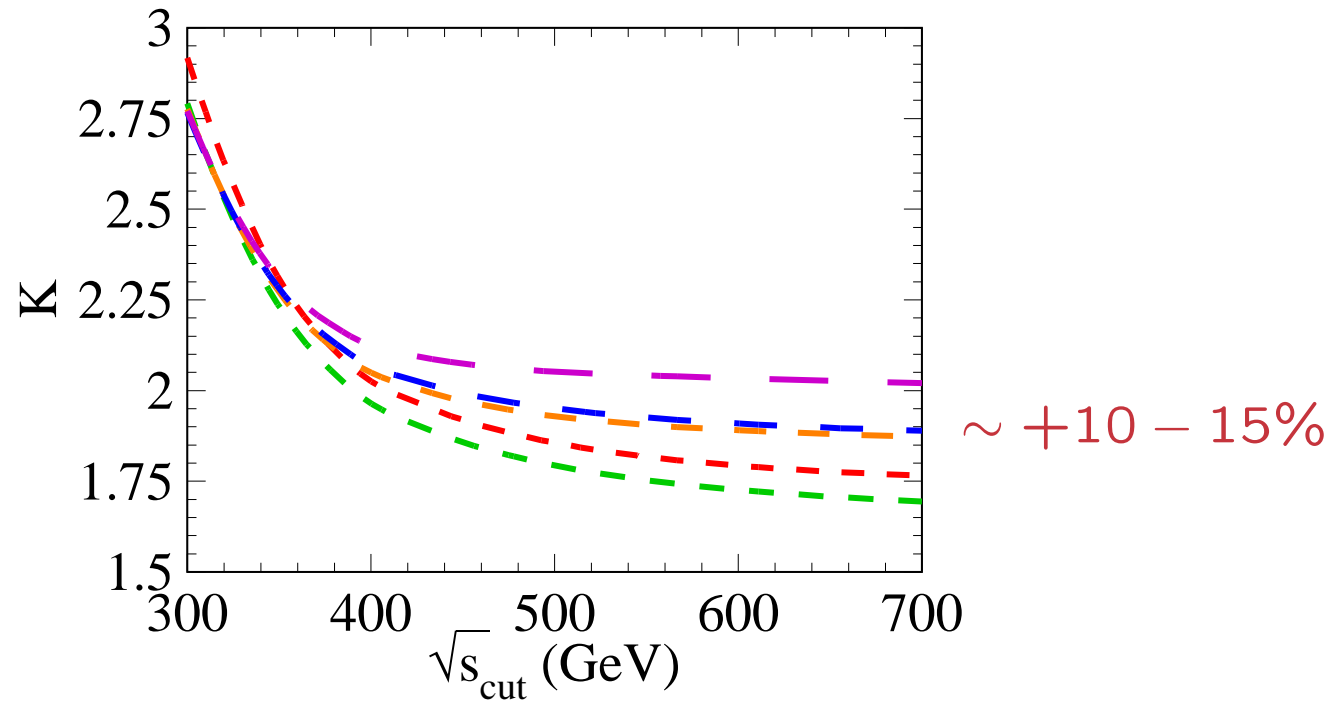


Dawson, Dittmaier, S.

- 2-loop QCD corrections:

$$\sigma = \sigma_0 + \frac{\sigma_1}{m_t^2} + \dots + \frac{\sigma_4}{m_t^8}$$

Grigo, Hoff, Melnikov, Steinhauser

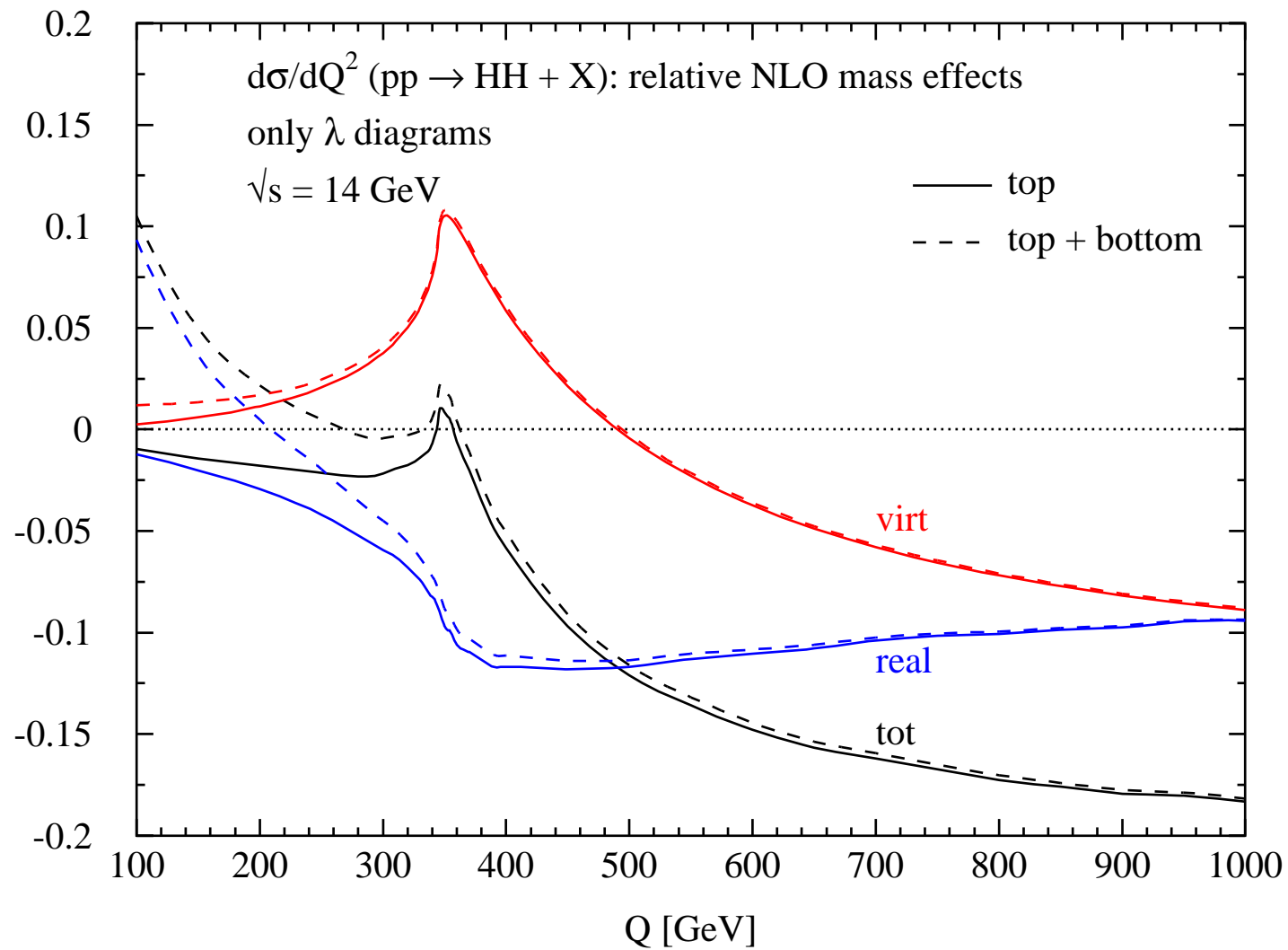


- NLO mass effects @ NLO in real corrections: $\sim -10\%$

Frederix, Frixione, Hirschi, Maltoni, Mattelaer, Torrielli, Vryonidou, Zaro

\Rightarrow clash of results

Diagrams with λ only:



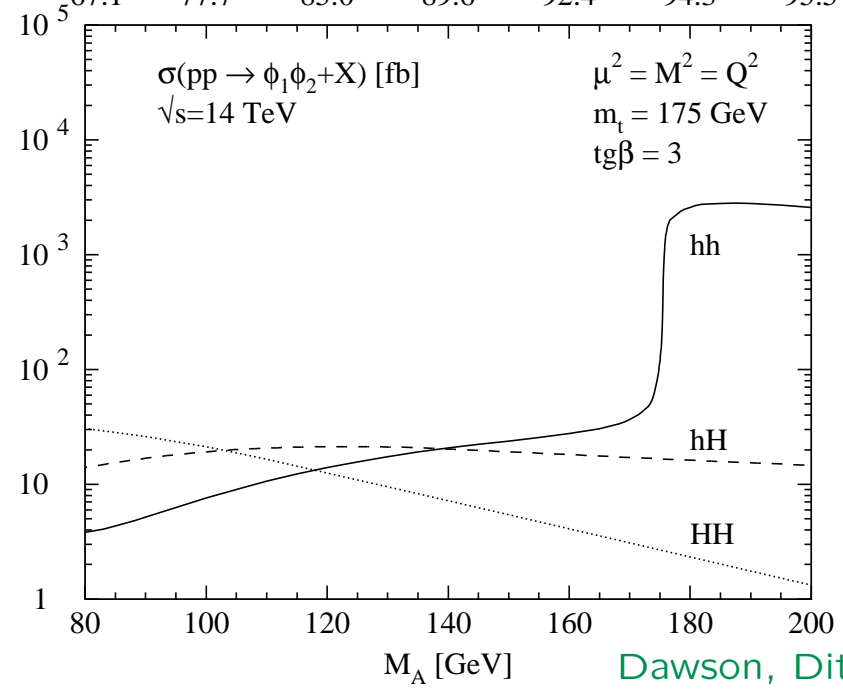
- situation unclear ← boxes different?

MSSM

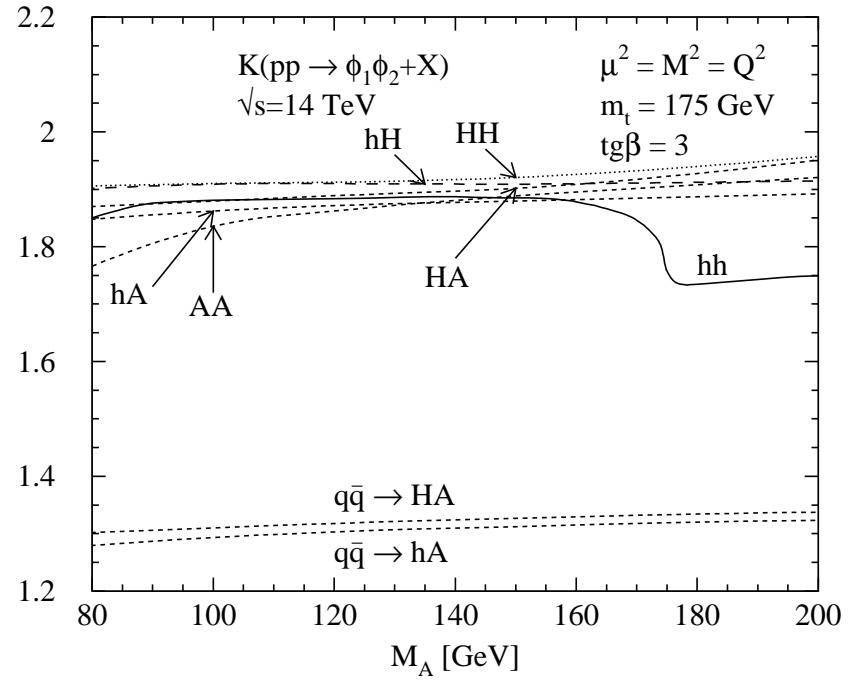
$gg \rightarrow hh, hH, HH, hA, HA, AA$ and $q\bar{q} \rightarrow hA, HA$

123.5	131.6	143.3	157.9	174.4	192.0	210.3	M_H [GeV]
67.1	77.7	85.0	89.6	92.4	94.3	95.5	M_h [GeV]

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possible strategies:

- comparison of virtual and real corrections separately [real corrections exact for Frederix et al.]
- comparison of virtual and real corrections for λ diagrams alone [exact result known]