Higher-order predictions for Higgs processes

Robert Harlander
RWTH Aachen University

Higgs 2022, Pisa

supported by

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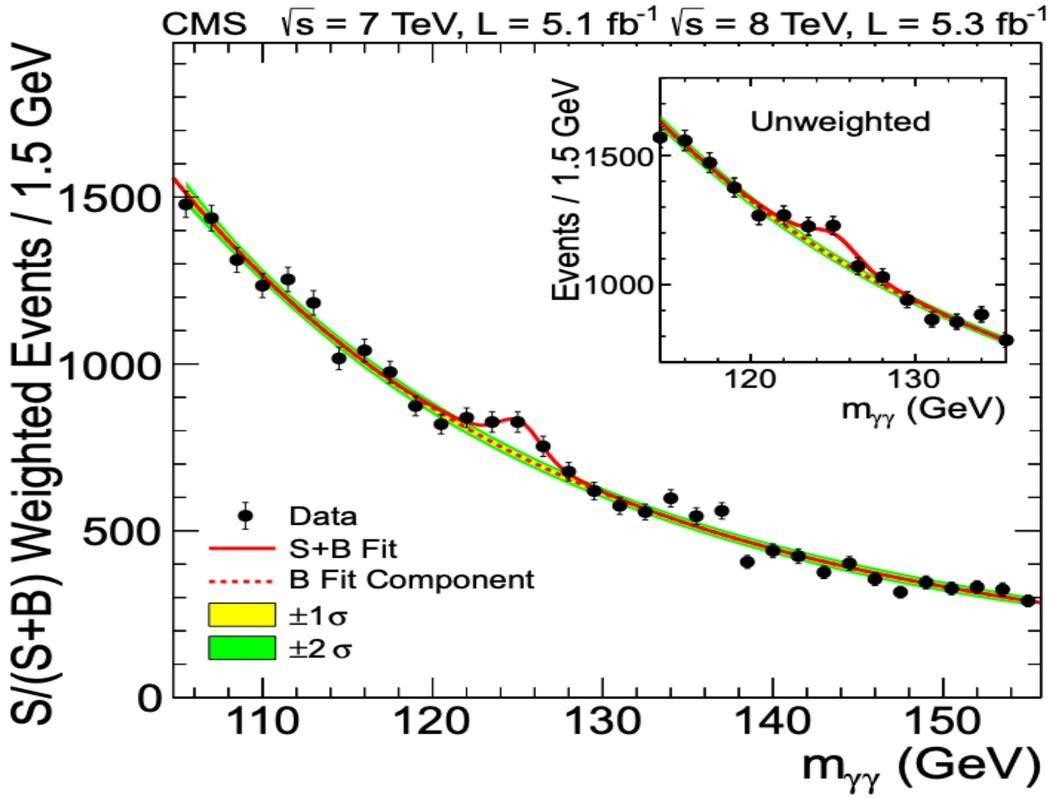

Observation of a New Boson at a Mass of 125 GeV with the CMS Experiment at the LHC #1

CMS Collaboration • Serguei Chatrchyan (Yerevan Phys. Inst.) et al. (Jul, 2012)

Published in: *Phys.Lett.B* 716 (2012) 30-61 • e-Print: 1207.7235 [hep-ex]

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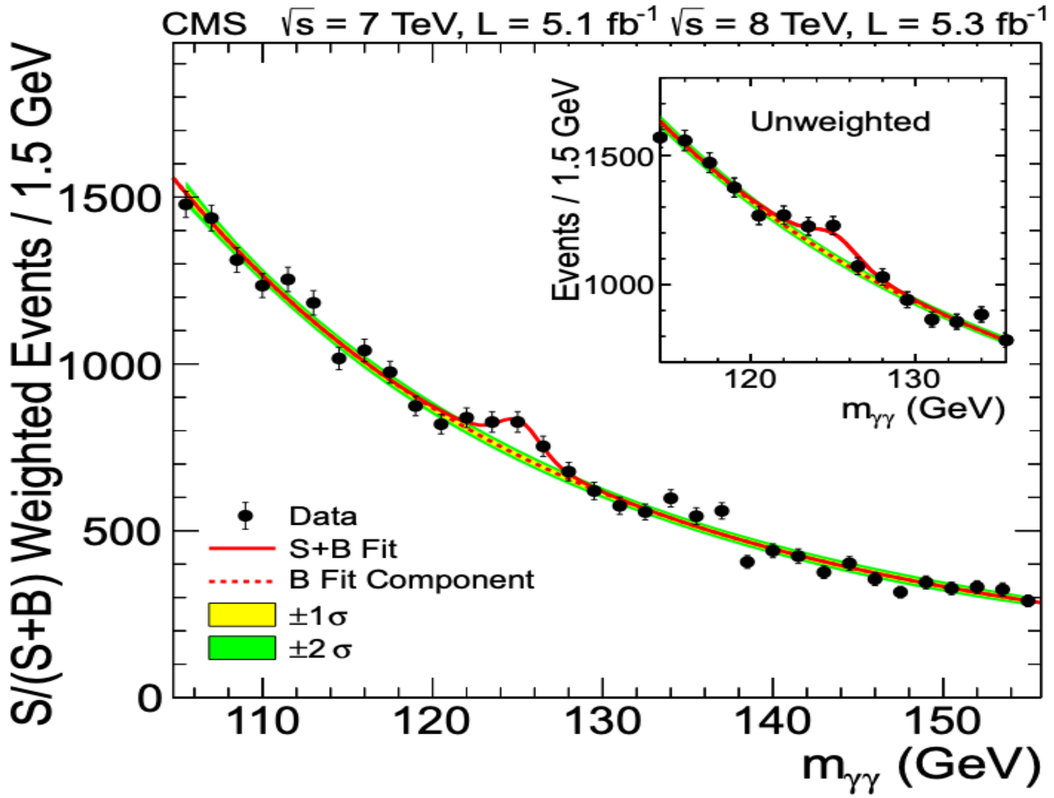

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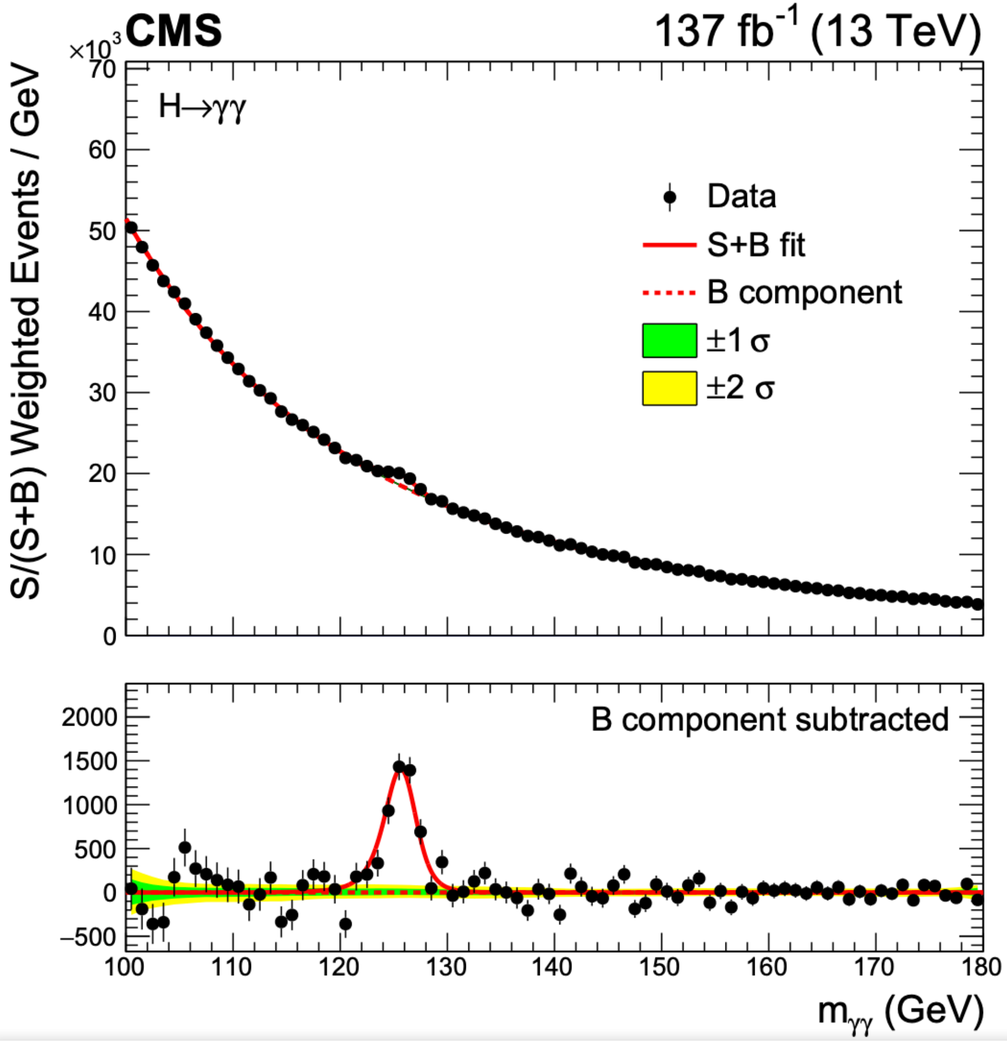

Measurement of the Higgs boson inclusive and differential fiducial production cross sections in the diphoton decay channel with pp collisions at $\sqrt{s}$ = 13 TeV #1

CMS Collaboration (Aug 25, 2022)

e-Print: 2208.12279 [hep-ex]

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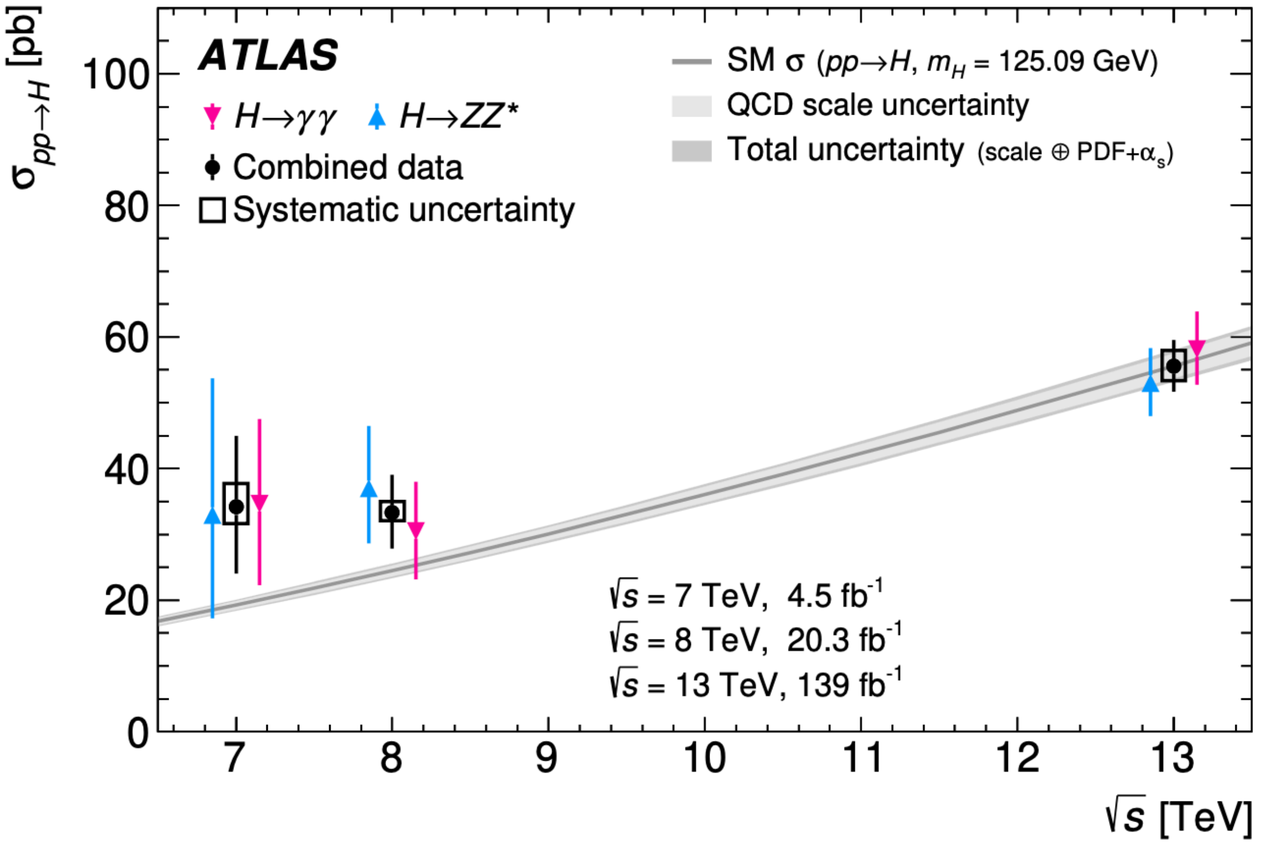


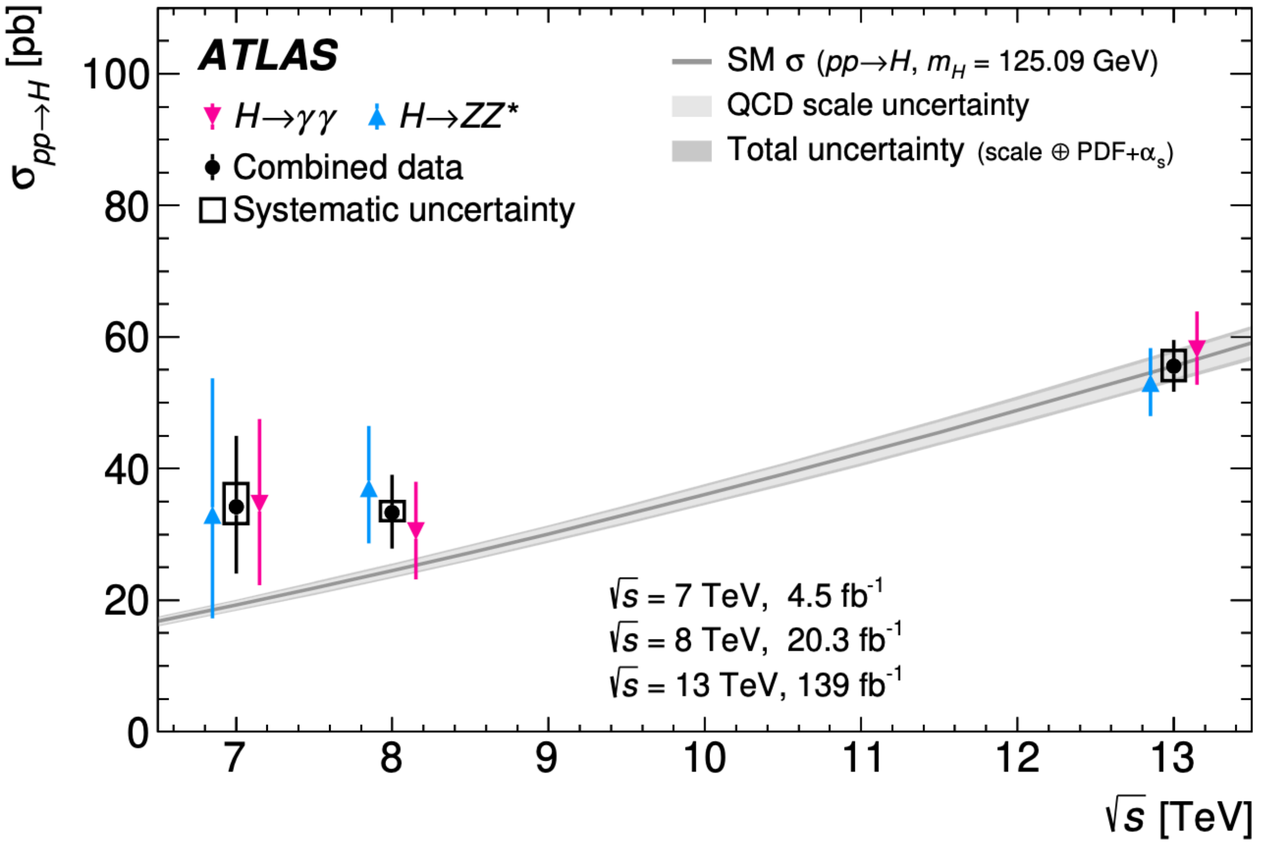
Measurement of the total and differential Higgs boson production cross-sections at $\sqrt{s} = 13$ TeV with the ATLAS detector by combining the $H \to ZZ^* \to 4\ell$ and $H \to \gamma\gamma$ decay channels

#1

ATLAS Collaboration (Jul 18, 2022)

e-Print: 2207.08615 [hep-ex]

pdf cite claim reference search 0 citations



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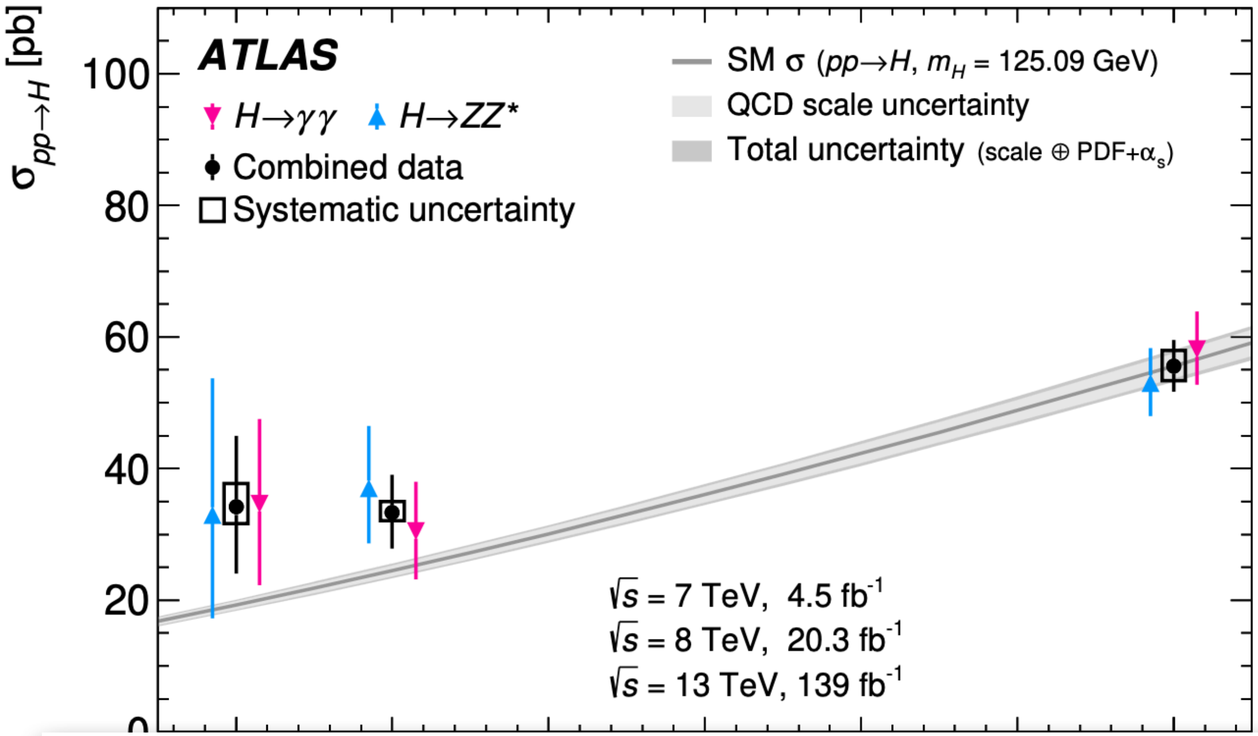
[15] LHC Higgs Cross Section Working Group, "Handbook of LHC Higgs cross sections: 4. Deciphering the nature of the Higgs sector", CERN Report CERN-2017-002-M, 2016. doi:10.23731/CYRM-2017-002, arXiv:1610.07922.



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[61] G. Billis, B. Dehnadi, M. A. Ebert, J. K. L. Michel and F. J. Tackmann, *Higgs p_T Spectrum and Total Cross Section with Fiducial Cuts at Third Resummed and Fixed Order in QCD*, Phys. Rev. Lett. **127** (7 2021) 072001, arXiv: **2102.08039 [hep-ph]**.

...tions: 4.
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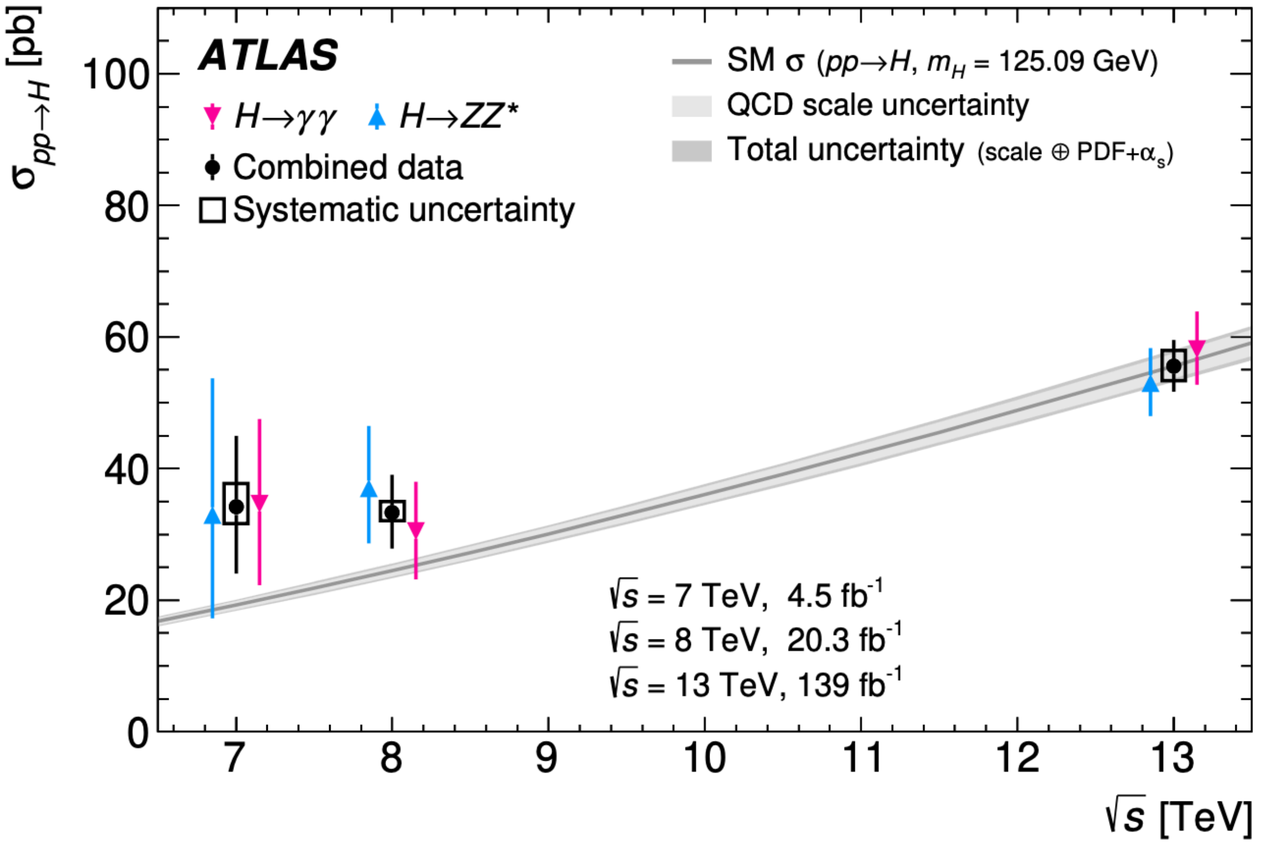

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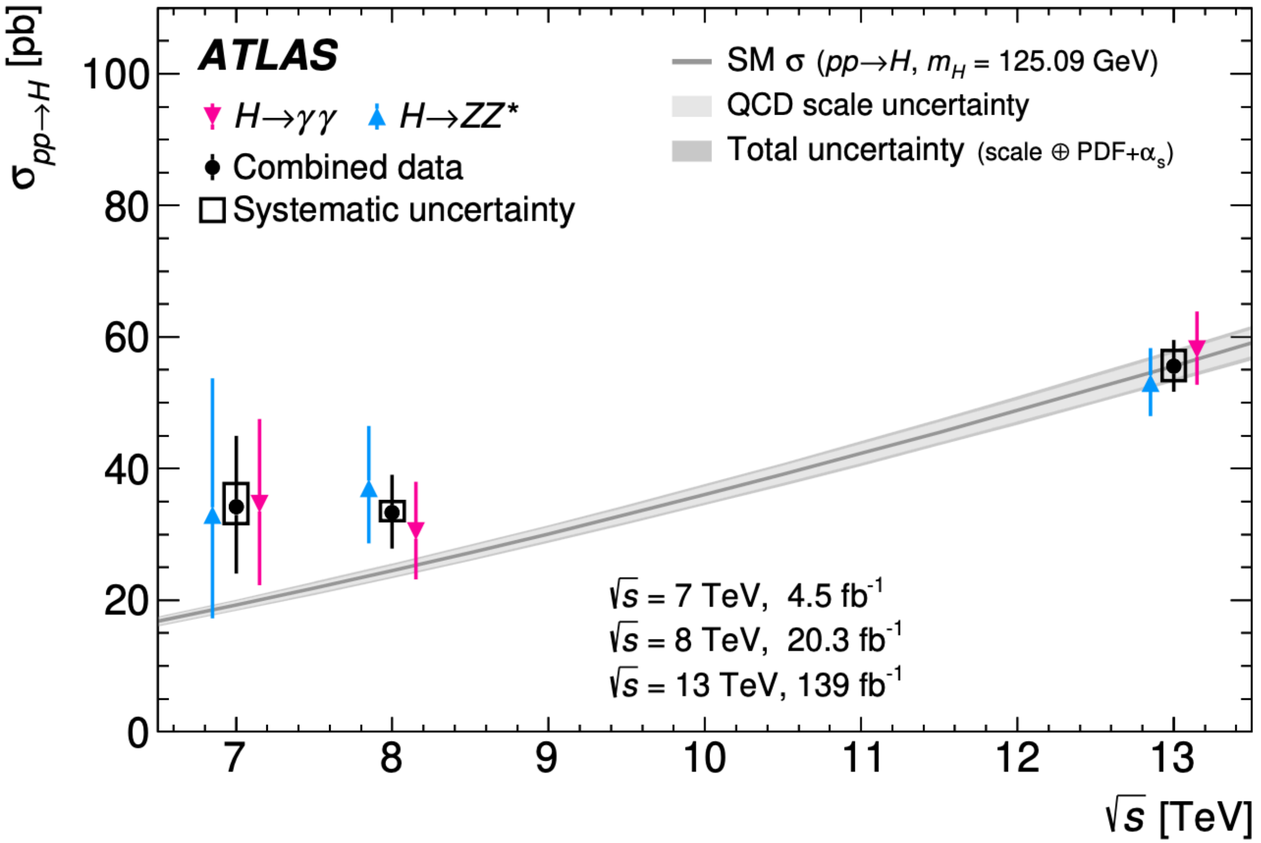

This talk: only references to papers *after* YR4

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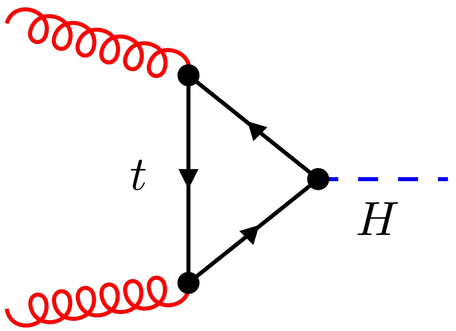
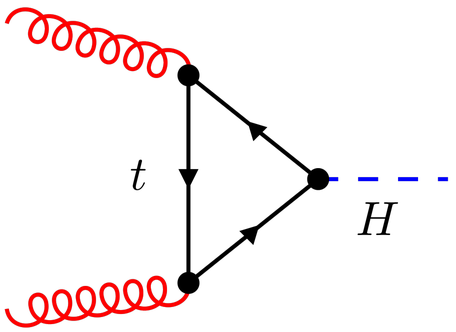


in YR4

Inclusive gluon fusion cross section:



in YR4

$$
\begin{aligned}
48.58\,\text{pb} = \quad & 16.00\,\text{pb} && (+32.9\%) && (\text{LO, rEFT}) \\
& +20.84\,\text{pb} && (+42.9\%) && (\text{NLO, rEFT}) \\
& -\ 2.05\,\text{pb} && (-4.2\%) && ((t,b,c)\text{, exact NLO}) \\
& +\ 9.56\,\text{pb} && (+19.7\%) && (\text{NNLO, rEFT}) \\
& +\ 0.34\,\text{pb} && (+0.7\%) && (\text{NNLO, } 1/m_t) \\
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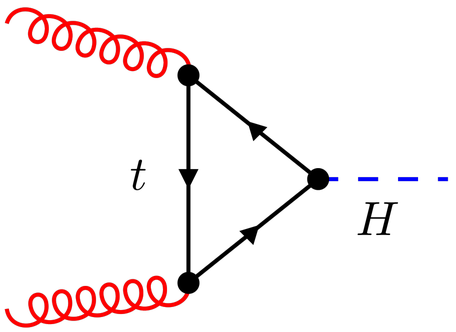

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Uncertainty estimate:

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$^{+0.10\,\text{pb}}_{-1.15\,\text{pb}}$	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16

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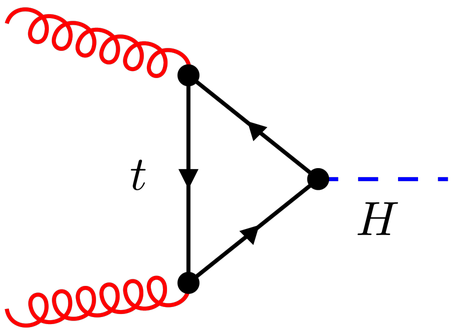

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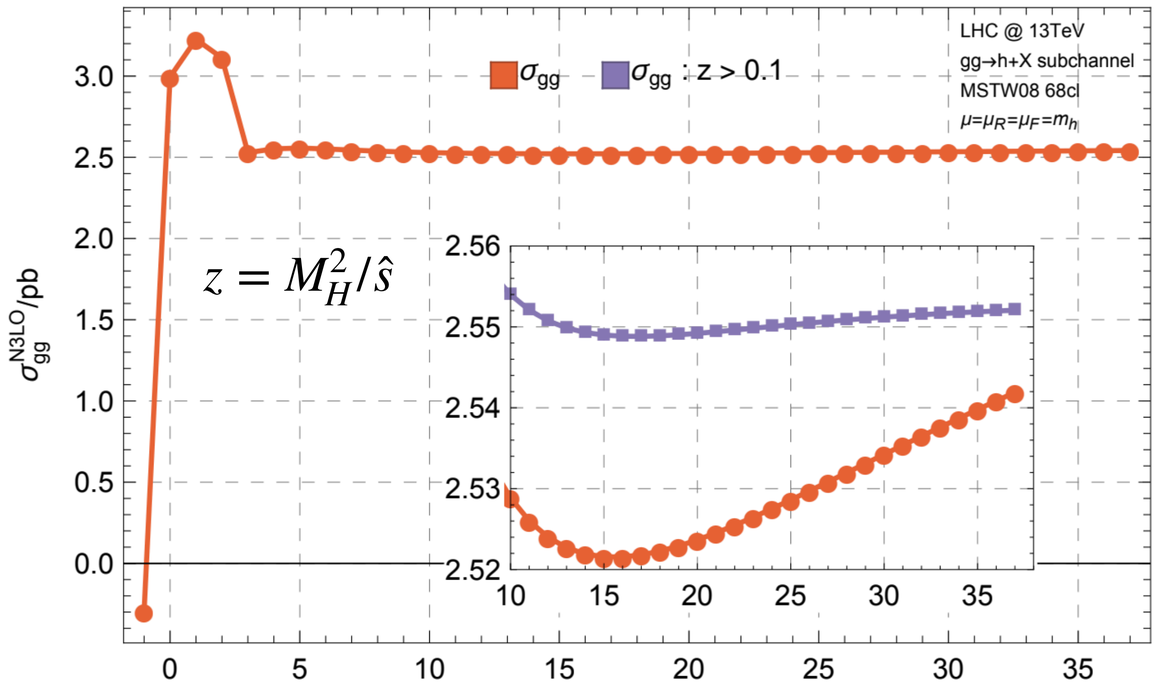
$$\hat{\sigma}(z) = \hat{\sigma}(z \to 1) + \mathcal{O}(1-z)^{39}$$



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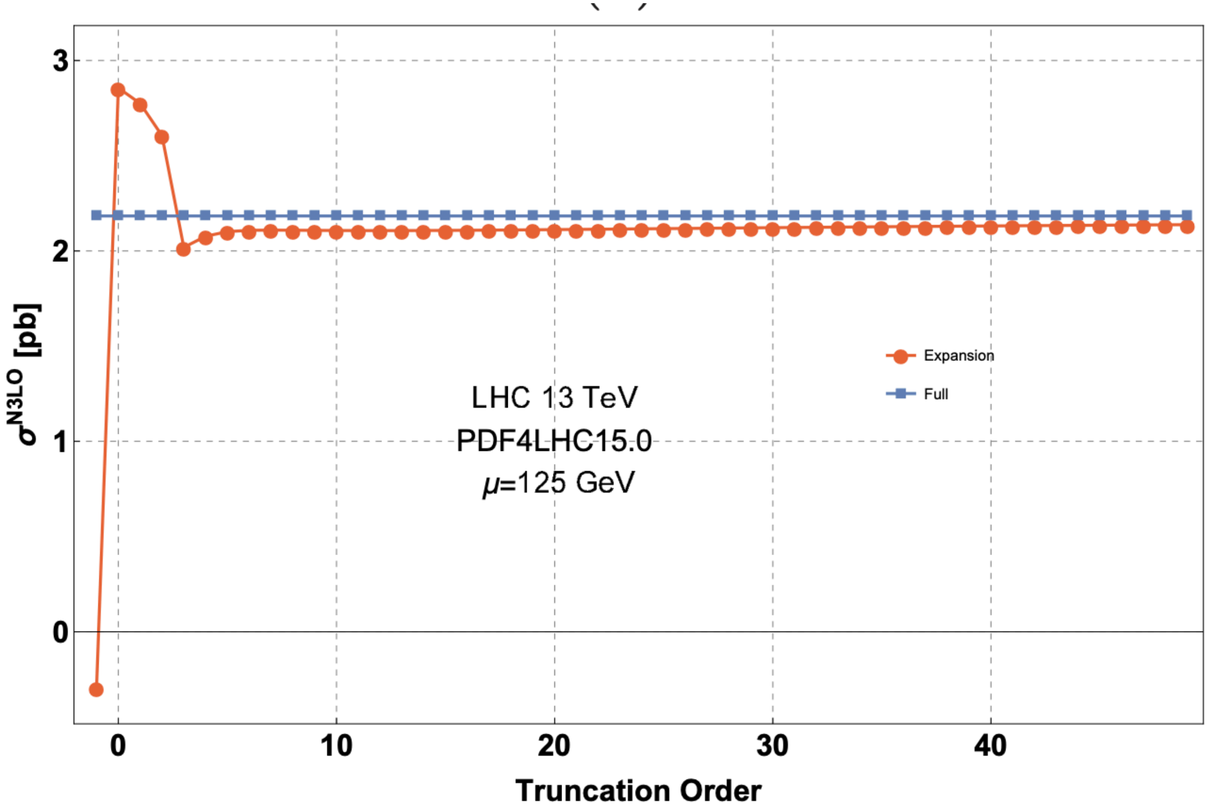

exact z dependence:

Higgs boson production at hadron colliders at N^{3}LO in QCD #4

Bernhard Mistlberger (CERN) (Feb 2, 2018)

Published in: *JHEP* 05 (2018) 028 • e-Print: 1802.00833 [hep-ph]

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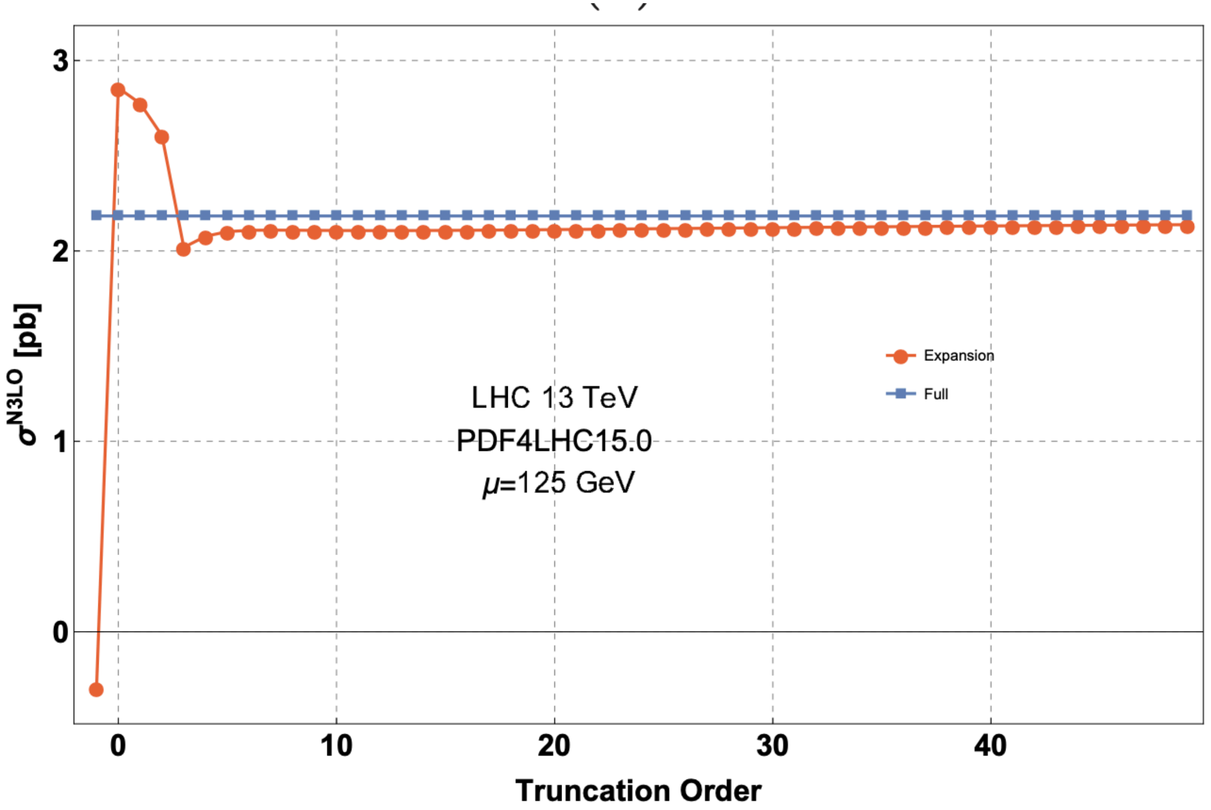

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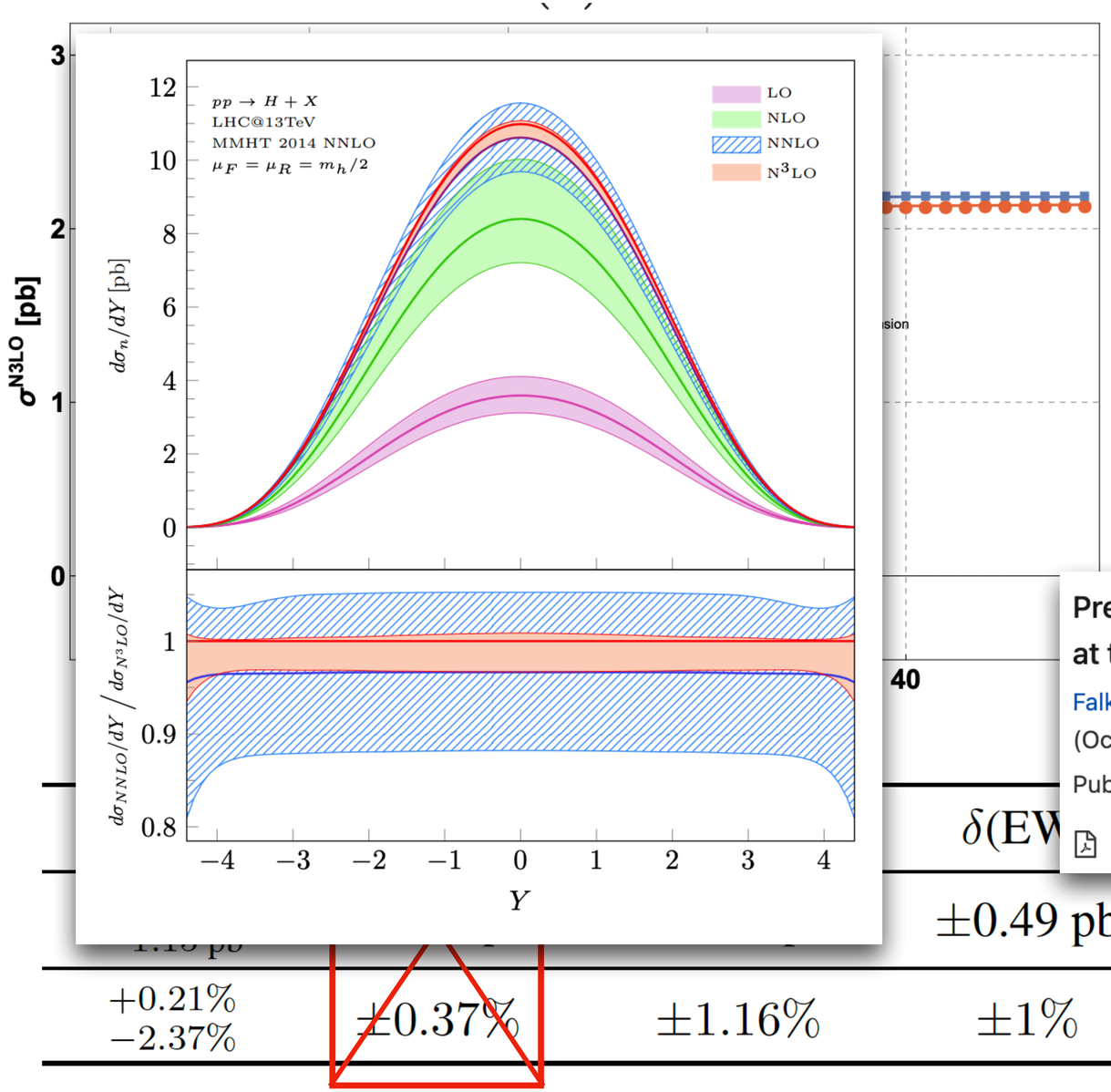

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Precision predictions at N^{3}LO for the Higgs boson rapidity distribution at the LHC #136

Falko Dulat (SLAC), Bernhard Mistlberger (MIT, Cambridge, CTP), Andrea Pelloni (Zurich, ETH) (Oct 22, 2018)

Published in: *Phys.Rev.D* 99 (2019) 3, 034004 • e-Print: 1810.09462 [hep-ph]

pdf DOI cite claim reference search 74 citations

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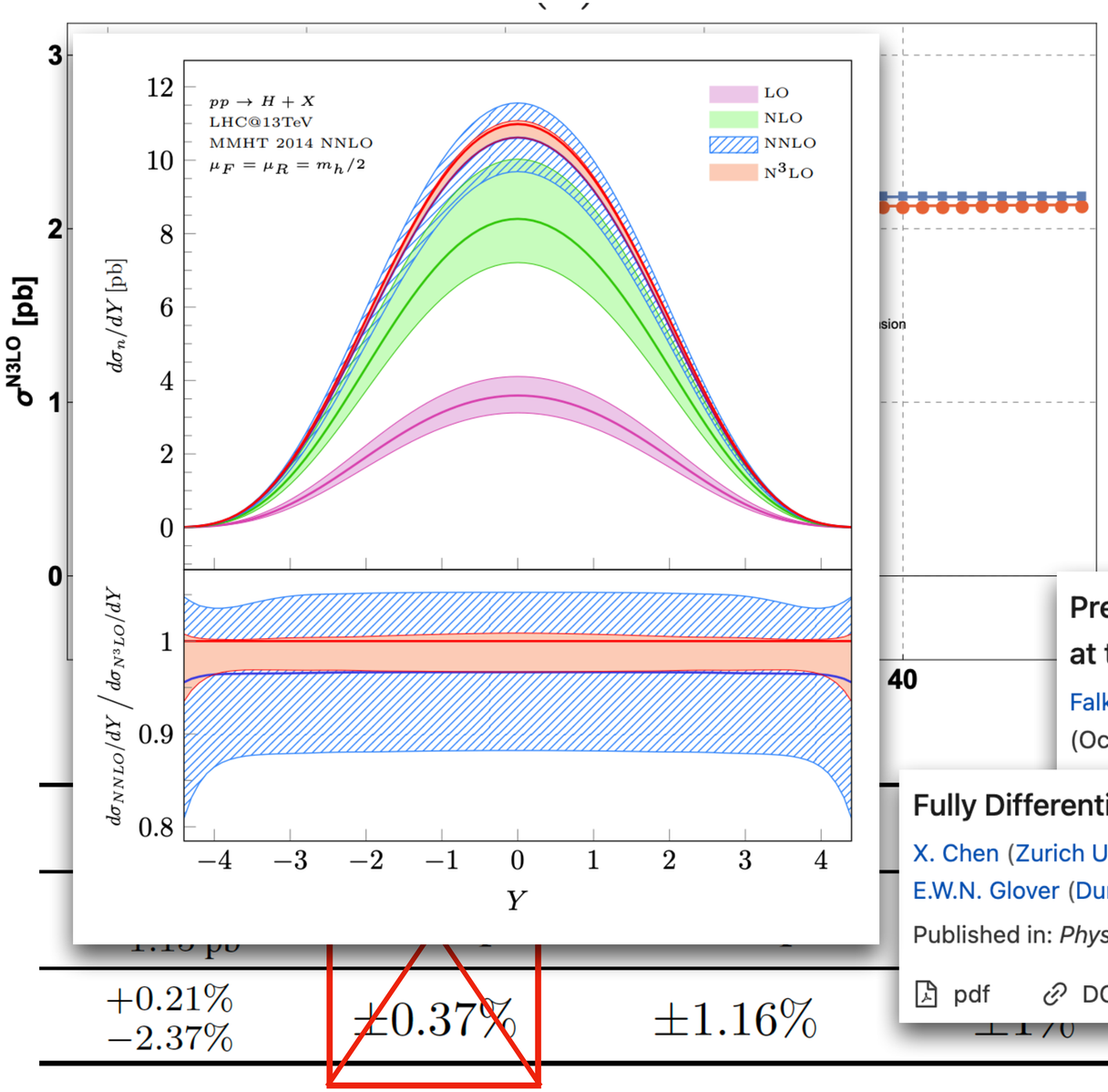

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74 citations

Fully Differential Higgs Boson Production to Third Order in QCD #98

X. Chen (Zurich U. and KIT, Karlsruhe, TP and KIT, Karlsruhe, IAP), T. Gehrmann (Zurich U.), E.W.N. Glover (Durham U., IPPP), A. Huss (CERN), B. Mistlberger (SLAC) et al. (Feb 15, 2021)

Published in: *Phys.Rev.Lett.* 127 (2021) 7, 072002 • e-Print: 2102.07607 [hep-ph]

pdf DOI cite claim reference search 37 citations

LHCH(XS)WG YR4 '16

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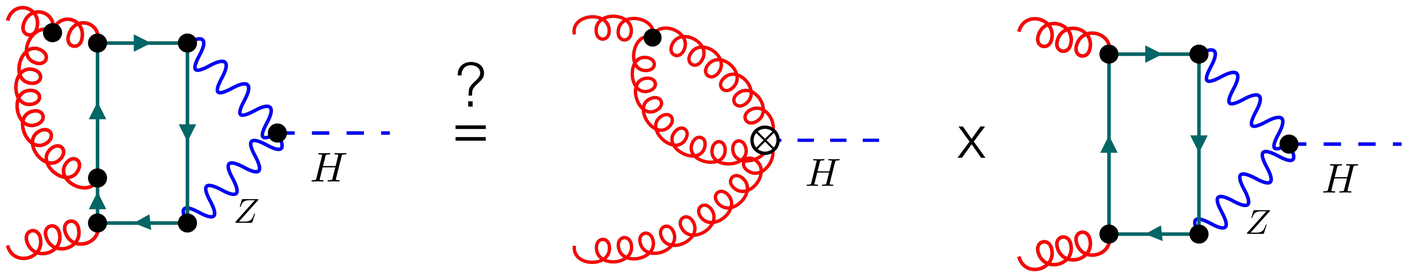

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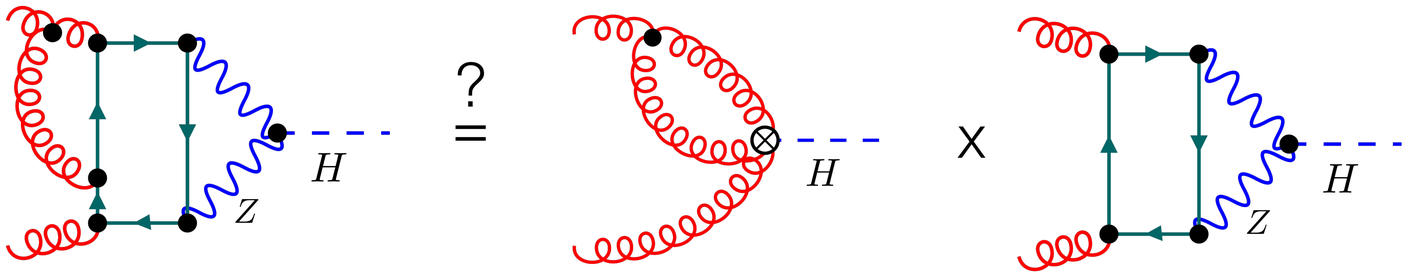

Higher order corrections to mixed QCD-EW contributions to Higgs boson production in gluon fusion #1

Marco Bonetti (KIT, Karlsruhe), Kirill Melnikov (KIT, Karlsruhe), Lorenzo Tancredi (CERN) (Jan 31, 2018)

Published in: *Phys.Rev.D* 97 (2018) 5, 056017, *Phys.Rev.D* 97 (2018) 9, 099906 (erratum) • e-Print: 1801.10403 [hep-ph]

pdf DOI cite claim reference search 63 citations

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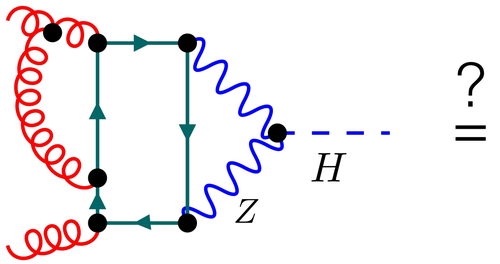

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Two-loop mixed QCD-EW corrections to $q\bar{q}$ → Hg, qg → Hq, and $\bar{q}g$ → $H\bar{q}$ #15

Marco Bonetti (RWTH Aachen U.), Erik Panzer (Oxford U., Inst. Math.), Lorenzo Tancredi (Munich, Tech. U.) (Mar 31, 2022)

Published in: *JHEP* 06 (2022) 115 • e-Print: 2203.17202 [hep-ph]

pdf DOI cite claim reference search 3 citations

Higher order corrections to mixed QCD-EW contributions to Higgs boson production in gluon fusion #1

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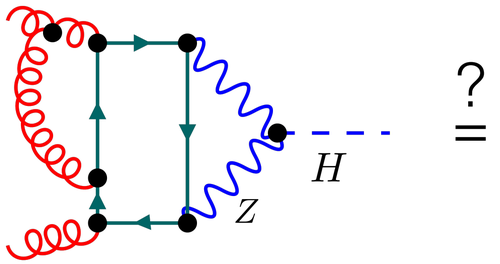

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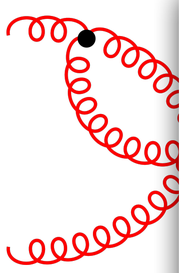

Two-loop mixed QCD-EW corrections to $q\bar{q} \to Hg$, $qg \to Hq$, and $\bar{q}g \to H\bar{q}$ #15

Marco Bonetti (RWTH Aachen U.), Erik Panzer (Oxford U., Inst. Math.), Lorenzo Tancredi (Munich, Tech. U.) (Mar 31, 2022)

Published in: *JHEP* 06 (2022) 115 • e-Print: 2

pdf DOI cite claim

Two-loop amplitude for mixed QCD-EW corrections to gg → Hg #

Matteo Becchetti (Turin U. and INFN, Turin), Francesco Moriello (Zurich, ETH), Armin Schweitzer (Zurich, ETH) (Dec 14, 2021)

Published in: *JHEP* 04 (2022) 139 • e-Print: 2112.07578 [hep-ph]

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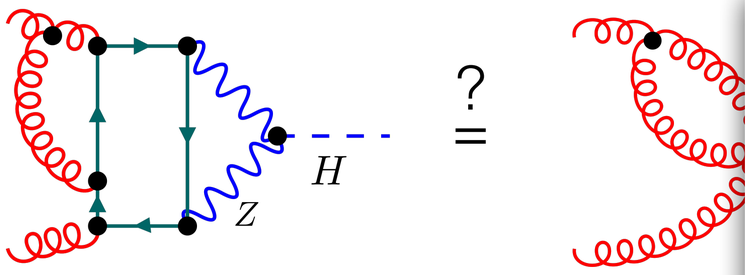
pdf DOI cite claim reference search 63 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$+0.21\%$ -2.37%	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



Two-loop mixed QCD-EW corrections to $q\bar{q} \to Hg$, $qg \to Hq$, and $\bar{q}g \to H\bar{q}$ #15

Marco Bonetti (RWTH Aachen U.), Erik Panzer (Oxford U., Inst. Math.), Lorenzo Tancredi (Munich, Tech. U.) (Mar 31, 2022)

Published in: *JHEP* 06 (2022) 115 • e-Print: 2

pdf DOI cite claim

Two-loop amplitude for mixed QCD-EW corrections to gg → Hg #

Matteo Becchetti (Turin U. and INFN, Turin), Francesco Moriello (Zurich, ETH), Armin Schweitzer (Zurich, ETH) (Dec 14, 2021)

Published in: *JHEP* 04 (2022) 139 • e-Print: 2112.07578 [hep-ph]

pdf DOI cite claim reference search 9 citatio

Two-loop mixed QCD-EW corrections to $gg \to Hg$ #66

Marco Bonetti (Karlsruhe U., ITP and RWTH Aachen U.), Erik Panzer (U. Oxford (main)), Vladimir A. Smirnov (SINP, Moscow), Lorenzo Tancredi (Oxford U., Theor. Phys.) (Jul 19, 2020)

Published in: *JHEP* 11 (2020) 045 • e-Print: 2007.09813 [hep-ph]

pdf DOI cite claim reference search 14 citations

Higher o… production in gluon fusion

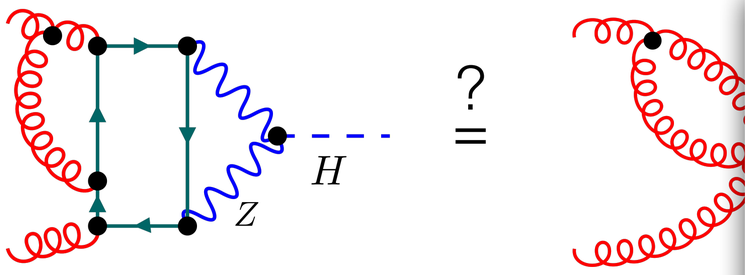
Marco Bonetti (KIT, Karlsruhe), Kirill Melnikov (KIT, Karlsruhe), Lorenzo Tancredi (CERN) (Jan 31, 2018)

Published in: *Phys.Rev.D* 97 (2018) 5, 056017, *Phys.Rev.D* 97 (2018) 9, 099906 (erratum) • e-Print: 1801.10403 [hep-ph]

pdf DOI cite claim reference search 63 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$+0.21\%$ -2.37%	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



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pdf DOI cite claim reference search 63 citations

Next-to-leading order corrections to light-quark mixed QCD-EW contributions to Higgs boson production #1

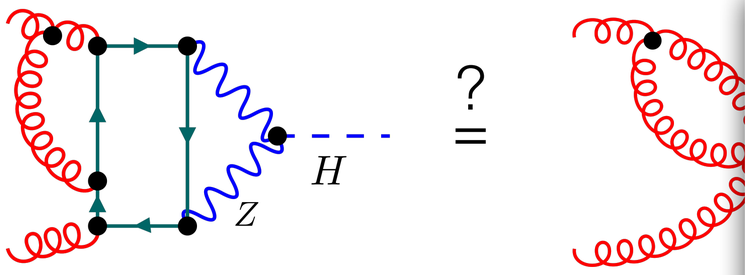
Matteo Becchetti (Turin U. and INFN, Turin), Roberto Bonciani (Rome U. and INFN, Rome), Vittorio Del Duca (Zurich, ETH and Frascati), Valentin Hirschi (Zurich, ETH), Francesco Moriello (Zurich, ETH) et al. (Oct 19, 2020)

Published in: *Phys.Rev.D* 103 (2021) 5, 054037 • e-Print: 2010.09451 [hep-ph]

pdf DOI cite claim reference search 15 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$+0.21\%$ -2.37%	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



Two-loop mixed QCD-EW corrections to $q\bar{q}$ → Hg, qg → Hq, and $\bar{q}g$ → $H\bar{q}$ #15

Marco Bonetti (RWTH Aachen U.), Erik Panzer (Oxford U., Inst. Math.), Lorenzo Tancredi (Munich, Tech. U.) (Mar 31, 2022)

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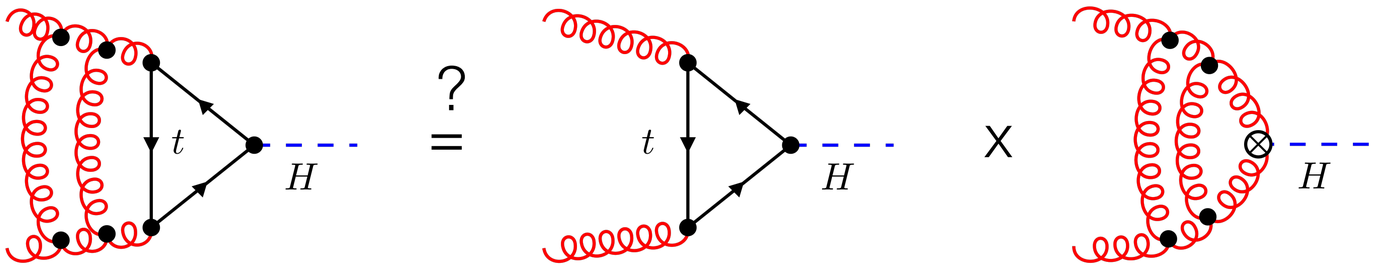

Inclusive gluon fusion cross section:

48.58 pb =	16.00 pb	(+32.9%)	(LO, rEFT)
	+ 20.84 pb	(+42.9%)	(NLO, rEFT)
	− 2.05 pb	(−4.2%)	((t, b, c), exact NLO)
	+ 9.56 pb	(+19.7%)	(NNLO, rEFT)
	+ 0.34 pb	(+0.7%)	(NNLO, $1/m_t$)
	+ 2.40 pb	(+4.9%)	(EW, QCD-EW)
	+ 1.49 pb	(+3.1%)	(N^{3}LO, rEFT)

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t, b, c)$	$\delta(1/m_t)$
$^{+0.10\text{ pb}}_{-1.15\text{ pb}}$	±0.18 pb	±0.56 pb	±0.49 pb	±0.40 pb	±0.49 pb
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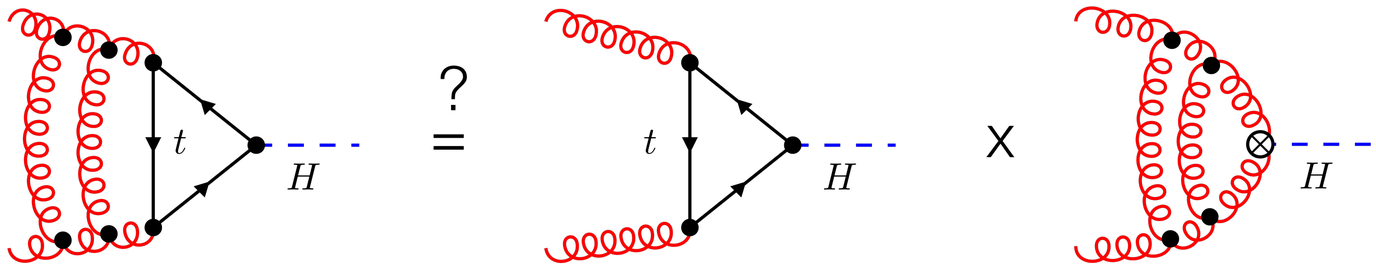
LHCH(XS)WG YR4 '16



Channel	$(\sigma^{\text{NNLO}}_{\text{exact}}/\sigma^{\text{NNLO}}_{\text{HEFT}} - 1)$ [%]
$\sqrt{s} = 8$ TeV	
gg	+0.62
qg	−18
qq	−4
Total	−0.10
$\sqrt{s} = 13$ TeV	
gg	+0.62
qg	−16
qq	−15
Total	−0.26

Inclusive gluon fusion cross section:

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Exact Top-Quark Mass Dependence in Hadronic Higgs Production #1

M. Czakon (Aachen, Tech. Hochsch.), R.V. Harlander (Aachen, Tech. Hochsch.), J. Klappert (Aachen, Tech. Hochsch.), M. Niggetiedt (Aachen, Tech. Hochsch.) (May 10, 2021)

Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

pdf DOI cite claim reference search 15 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t, b, c)$	$\delta(1/m_t)$
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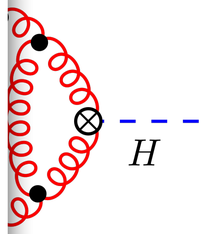
LHCH(XS)WG YR4 '16

Top quark mass dependence of the Higgs boson-gluon form factor at three loops #112

Joshua Davies (KIT, Karlsruhe, TTP), Ramona Gröber (Humboldt U., Berlin), Andreas Maier (DESY, Zeuthen), Thomas Rauh (U. Bern, AEC), Matthias Steinhauser (KIT, Karlsruhe, TTP)

(Jun 3, 2019)

Published in: *Phys.Rev.D* 100 (2019) 3, 034017, *Phys.Rev.D* 102 (2020) 5, 059901 (erratum) • e-Print: 1906.00982 [hep-ph]



Inc

$48.58\,\text{pb} =$	$16.00\,\text{pb}$	$(+32.9\%)$	(LO, rEFT)
	$+\,20.84\,\text{pb}$	$(+42.9\%)$	(NLO, rEFT)
	$-\,2.05\,\text{pb}$	(-4.2%)	((t,b,c), exact NLO)
	$+\,9.56\,\text{pb}$	$(+19.7\%)$	(NNLO, rEFT)
	$+\,0.34\,\text{pb}$	$(+0.7\%)$	(NNLO, $1/m_t$)
	$+\,2.40\,\text{pb}$	$(+4.9\%)$	(EW, QCD-EW)
	$+\,1.49\,\text{pb}$	$(+3.1\%)$	(N^{3}LO, rEFT)

Channel	$(\sigma^{\text{NNLO}}_{\text{exact}}/\sigma^{\text{NNLO}}_{\text{HEFT}} - 1)$ [%]
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qg	-18
qq	-4
Total	-0.10
$\sqrt{s} = 13$ TeV	
gg	$+0.62$
qg	-16
qq	-15
Total	-0.26

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M. Czakon (Aachen, Tech. Hochsch.), R.V. Harlander (Aachen, Tech. Hochsch.), J. Klappert (Aachen, Tech. Hochsch.), M. Niggetiedt (Aachen, Tech. Hochsch.) (May 10, 2021)

Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

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LHCH(XS)WG YR4 '16

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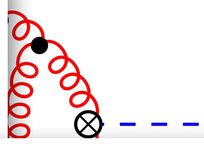
pdf DOI cite claim



The light-fermion contribution to the exact Higgs-gluon form factor in QCD #106

Robert V. Harlander (Aachen, Tech. Hochsch.), Mario Prausa (Freiburg U.), Johann Usovitsch (Trinity Coll., Dublin) (Jul 16, 2019)

Published in: *JHEP* 10 (2019) 148, *JHEP* 08 (2020) 101 (erratum) • e-Print: 1907.06957 [hep-ph]

pdf DOI cite claim reference search 19 citations

Channel	$(\sigma^{\rm NNLO}_{\rm exact}/\sigma^{\rm NNLO}_{\rm HEFT}-1)$ [%]
$\sqrt{s}=8$ TeV	
qq	$+0.62$
	-18
	-4
	-0.10
	$+0.62$
	-16
	-15
	-0.26

Inc

$$
\begin{aligned}
48.58\,\text{pb} = \quad & 16.00\,\text{pb} && (+32.9\%) && \\
& +\,20.84\,\text{pb} && (+42.9\%) && \\
& -\,\;2.05\,\text{pb} && (-4.2\%) && \\
& +\,\;9.56\,\text{pb} && (+19.7\%) && (\text{NNLO, rEFT}) \\
& +\,\;0.34\,\text{pb} && (+0.7\%) && (\text{NNLO, } 1/m_t) \\
& +\,\;2.40\,\text{pb} && (+4.9\%) && (\text{EW, QCD-EW}) \\
& +\,\;1.49\,\text{pb} && (+3.1\%) && (\text{N}^3\text{LO, rEFT})
\end{aligned}
$$

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M. Czakon (Aachen, Tech. Hochsch.), R.V. Harlander (Aachen, Tech. Hochsch.), J. Klappert (Aachen, Tech. Hochsch.), M. Niggetiedt (Aachen, Tech. Hochsch.) (May 10, 2021)

Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

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LHCH(XS)WG YR4 '16

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(Jun 3, 2019)

Published in: *Phys.Rev.D* 100 (2019) 3, 034017, *Phys.R*

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Channel	$(\sigma^{\rm NNLO}_{\rm exact}/\sigma^{\rm NNLO}_{\rm HEFT}-1)$ [%]
$\sqrt{s}=8$ TeV	
qq	$+0.62$
	-18
	-4
	-0.10
	$+0.62$
	-16
	-15
	-0.26

Inc

$$
\begin{aligned}
48.58\,\text{pb} = \quad & 16.00\,\text{pb} && (+32.9\%) && \\
& +\,20.84\,\text{pb} && (+42.9\%) && \\
& -\,\;2.05\,\text{pb} && (-4.2\%) && \\
& +\,\;9.56\,\text{pb} && (+19.7\%) && (\text{NNLO, rEFT}) \\
& +\,\;0.34\,\text{pb} && (+0.7\%) && (\text{NNLO, } 1/m_t) \\
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Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

pdf DOI cite claim reference search 15 citations

Exact quark-mass dependence of the Higgs-gluon form factor at three loops in QCD #3

Micha L. Czakon (Aachen, Tech. Hochsch.), Marco Niggetiedt (Aachen, Tech. Hochsch.) (Jan 9, 2020)

Published in: *JHEP* 05 (2020) 149 • e-Print: 2001.03008 [hep-ph]

pdf DOI cite claim reference search 29 citations

				$\delta(t,b,c)$	$\delta(1/m_t)$
-1.15 pb			b	± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16

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(Jun 3, 2019)

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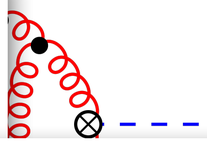

Channel	$(\sigma^{\rm NNLO}_{\rm exact}/\sigma^{\rm NNLO}_{\rm HEFT}-1)$ [%]
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qg	$+0.62$
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	-4
	-0.10
	$+0.62$
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	-0.26

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Inc

$48.58\,\text{pb} = \quad 16.00\,\text{pb} \quad (+32.9\%)$

Top Quark Mass Effects in Higgs Boson Production at Four-Loop Order: Virtual Corrections #95

Joshua Davies (KIT, Karlsruhe, TTP), Florian Herren (KIT, Karlsruhe, TTP), Matthias Steinhauser (KIT, Karlsruhe, TTP) (Nov 22, 2019)

Published in: *Phys.Rev.Lett.* 124 (2020) 11, 112002 • e-Print: 1911.10214 [hep-ph]

Exact Top-Quark Mass Dependence in Hadronic Higgs Production #1

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Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

pdf DOI cite claim reference search 15 citations

Exact quark-mass dependence of the Higgs-gluon form factor at three loops in QCD #3

Micha L. Czakon (Aachen, Tech. Hochsch.), Marco Niggetiedt (Aachen, Tech. Hochsch.) (Jan 9, 2020)

Published in: *JHEP* 05 (2020) 149 • e-Print: 2001.03008 [hep-ph]

pdf DOI cite claim reference search 29 citations

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				± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16

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(Jun 3, 2019)

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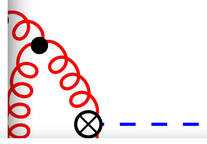
e-Print: 1906.00982 [hep-ph]

pdf DOI cite claim



Channel	$(\sigma^{\rm NNLO}_{\rm exact}/\sigma^{\rm NNLO}_{\rm HEFT}-1)$ [%]
$\sqrt{s}=8$ TeV	
qg	$+0.62$
	-18
	-4
	-0.10
	$+0.62$
	-16
	-15
	-0.26

The light-fermion contribution to the exact Higgs-gluon form factor in QCD #106

Robert V. Harlander (Aachen, Tech. Hochsch.), Mario Prausa (Freiburg U.), Johann Usovitsch (Trinity Coll., Dublin) (Jul 16, 2019)

Published in: *JHEP* 10 (2019) 148, *JHEP* 08 (2020) 101 (erratum) • e-Print: 1907.06957 [hep-ph]

claim reference search 19 citations

Inc

$48.58\,\text{pb} = \quad 16.00\,\text{pb} \quad (+32.9\%)$

Top Quark Mass Effects in Higgs Boson Production at Four-Loop Order: Virtual Corrections #95

Joshua Davies (KIT, Karlsruhe, TTP), Florian Herren (KIT, Karlsruhe, TTP), Matthias Steinhauser (KIT, Karlsruhe, TTP) (Nov 22, 2019)

Published in: *Phys.Rev.Lett.* 124 (2020) 11, 112002 • e-Print: 1911.10214 [hep-ph]

Exact Top-Quark Mass Dependence in Hadronic Higgs Production #1

M. Czakon (Aachen, Tech. Hochsch.), R.V. Harlander (Aachen, Tech. Hochsch.), J. Klappert (Aachen, Tech. Hochsch.), M. Niggetiedt (Aachen, Tech. Hochsch.) (May 10, 2021)

Published in: *Phys.Rev.Lett.* 127 (2021) 16, 162002 • e-Print: 2105.04436 [hep-ph]

pdf DOI cite claim reference search 15 citations

Exact quark-mass dependence of the Higgs-gluon form factor at three loops in QCD #3

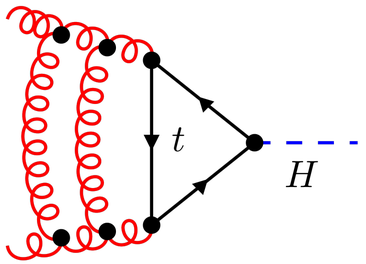
Micha L. Czakon (Aachen, Tech. Hochsch.), Marco Niggetiedt (Aachen, Tech. Hochsch.) (Jan 9, 2020)

Published in: *JHEP* 05 (2020) 149 • e-Print: 2001.03008 [hep-ph]

pdf DOI cite claim reference search 29 citations

				$\delta(t,b,c)$	$\delta(1/m_t^2)$
				± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16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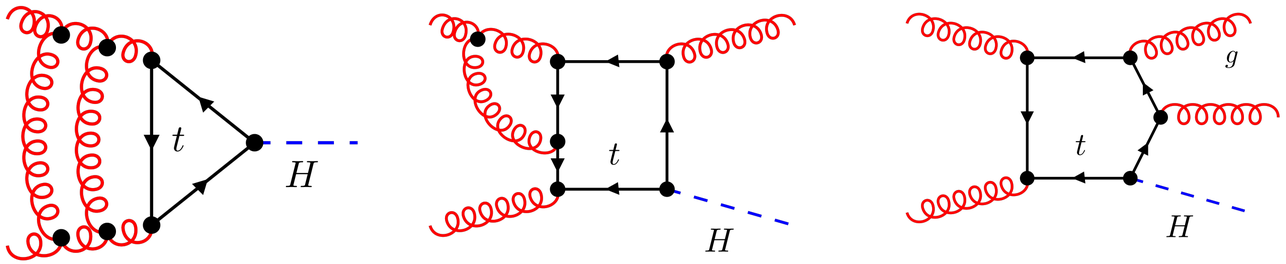
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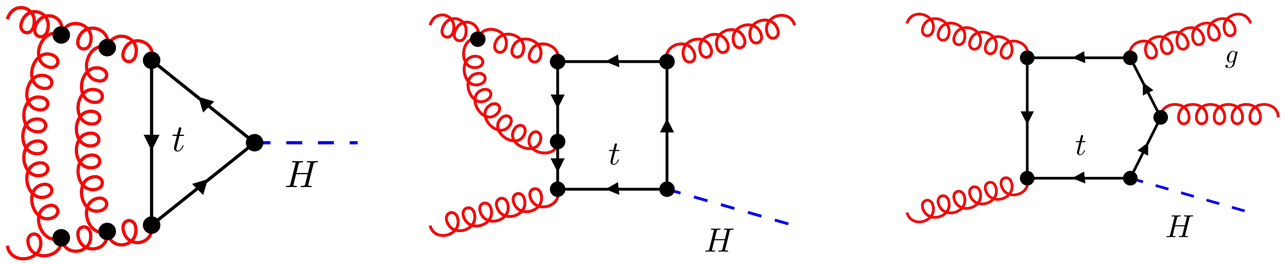
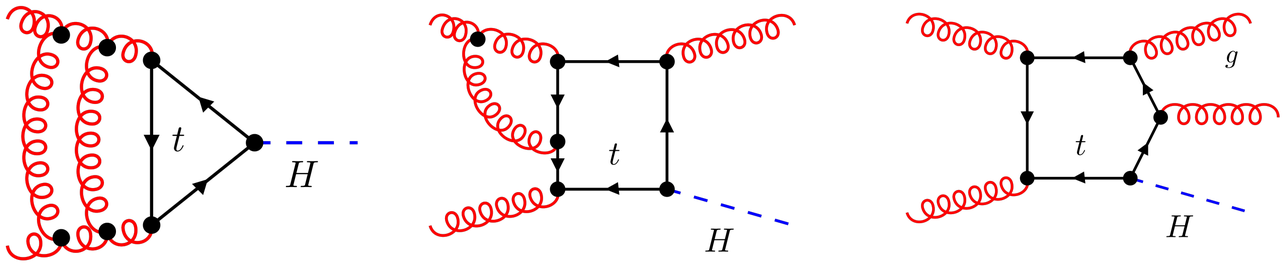
t
H

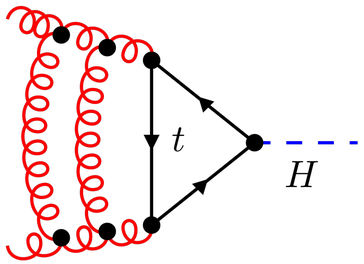


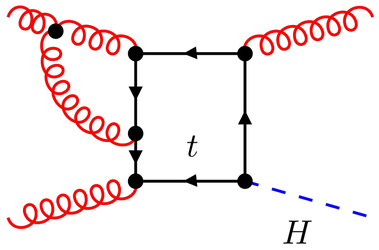
$$p_{T,H} \equiv 0$$

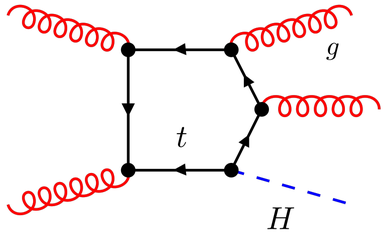


$p_{T,H} \equiv 0$

$p_{T,H} > 0$



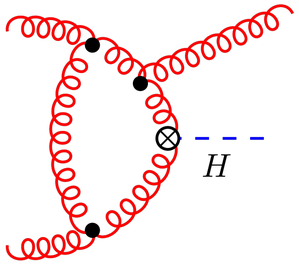


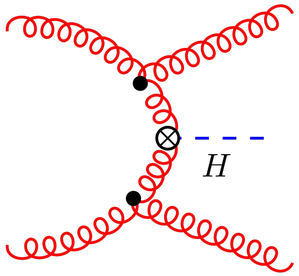


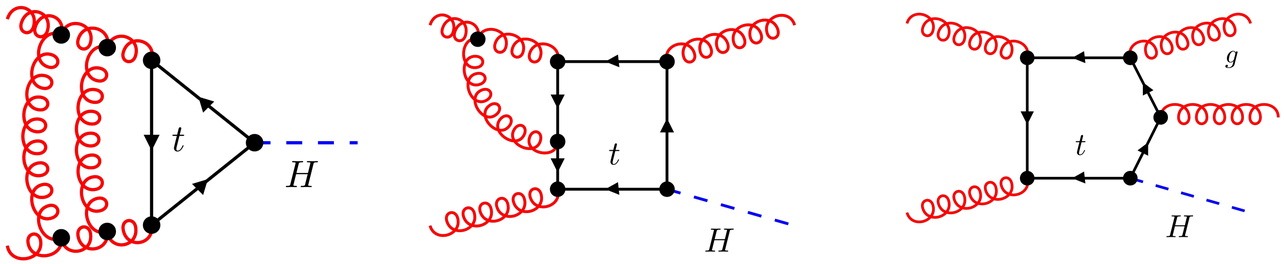
$p_{T,H} \equiv 0$

$p_{T,H} > 0$

VS.



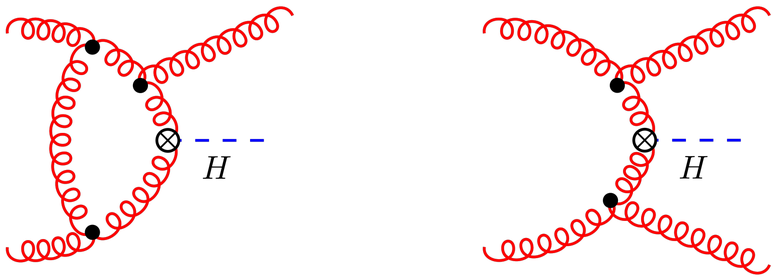


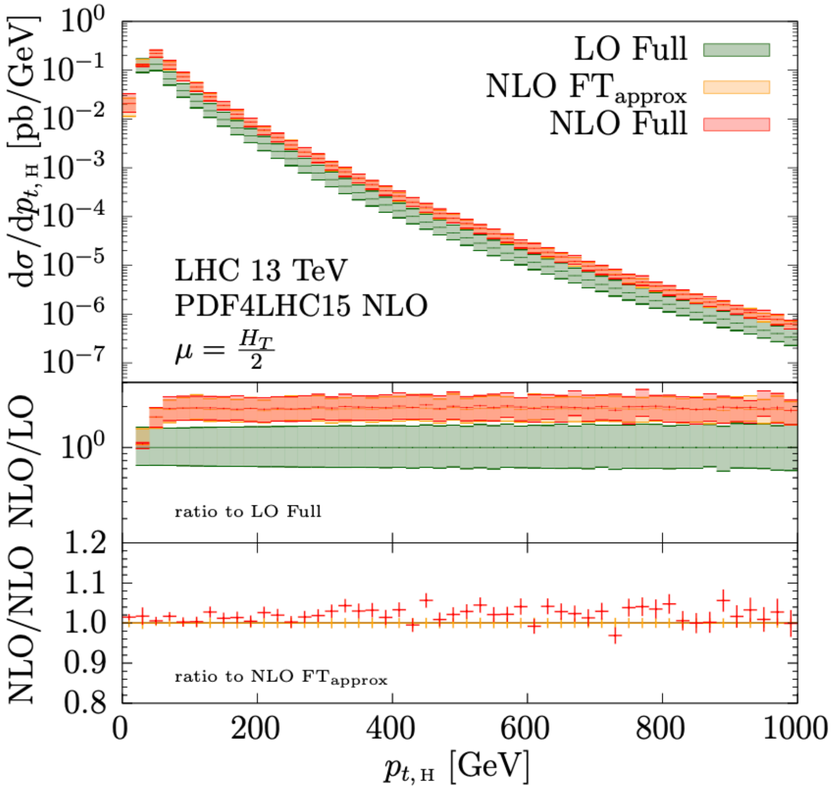


$p_{T,H} \equiv 0$

$p_{T,H} > 0$

vs.



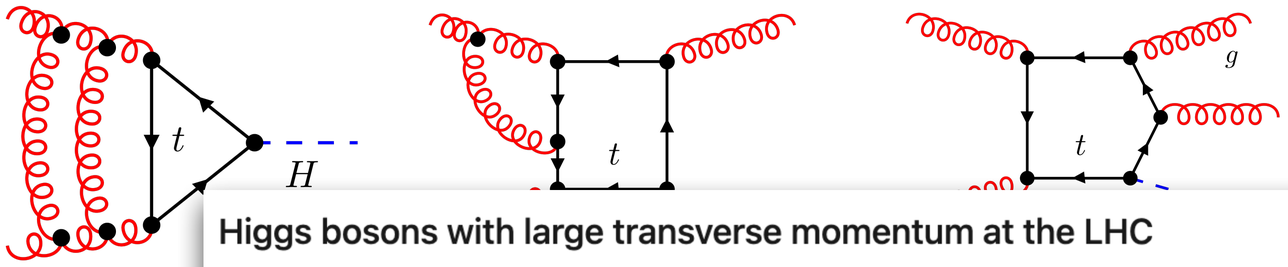


Next-to-Leading-Order QCD Corrections to Higgs Boson Plus Jet Production with Full Top-Quark Mass Dependence #1

S.P. Jones (Munich, Max Planck Inst.), M. Kerner (Munich, Max Planck Inst.), G. Luisoni (Munich, Max Planck Inst.) (Feb 1, 2018)

Published in: *Phys.Rev.Lett.* 120 (2018) 16, 162001, *Phys.Rev.Lett.* 128 (2022) 5, 059901 (erratum) • e-Print: 1802.00349 [hep-ph]

pdf DOI cite claim reference search 104 citations



$p_{T,H} \equiv$

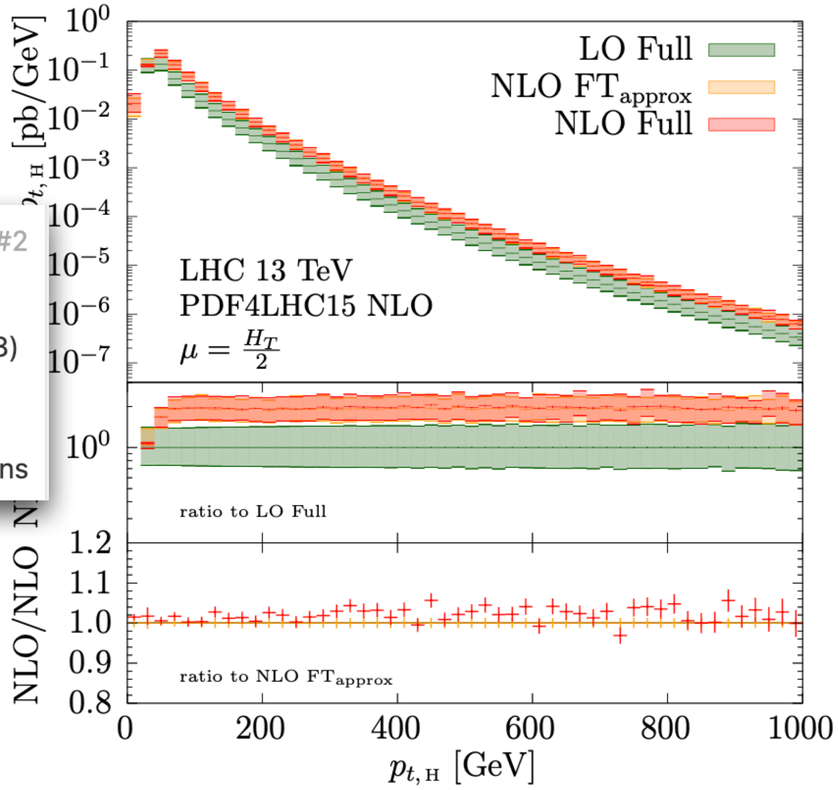
Higgs bosons with large transverse momentum at the LHC #2

Jonas M. Lindert (Durham U., IPPP), Kirill Kudashkin (KIT, Karlsruhe, TTP), Kirill Melnikov (KIT, Karlsruhe, TTP), Christopher Wever (KIT, Karlsruhe, TTP and KIT, Karlsruhe, IKP) (Jan 24, 2018)

Published in: *Phys.Lett.B* 782 (2018) 210-214 • e-Print: 1801.08226 [hep-ph]

pdf DOI cite claim reference search 62 citations

VS.



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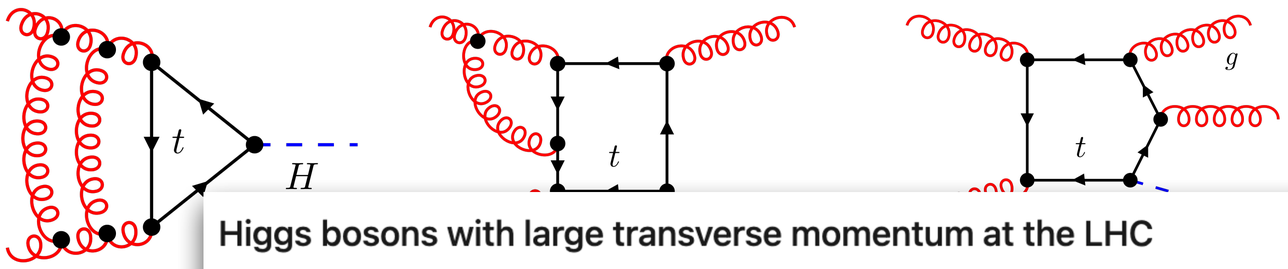
S.P. Jones (Munich, Max Planck Inst.), M. Kerner (Munich, Max Planck Inst.), G. Luisoni (Munich, Max Planck Inst.) (Feb 1, 2018)

Published in: *Phys.Rev.Lett.* 120 (2018) 16, 162001, *Phys.Rev.Lett.* 128 (2022) 5, 059901 (erratum) • e-Print: 1802.00349 [hep-ph]

pdf DOI cite claim reference search 104 citations



$p_{T,H} \equiv$

Higgs bosons with large transverse momentum at the LHC #2

Jonas M. Lindert (Durham U., IPPP), Kirill Kudashkin (KIT, Karlsruhe, TTP), Kirill Melnikov (KIT, Karlsruhe, TTP), Christopher Wever (KIT, Karlsruhe, TTP and KIT, Karlsruhe, IKP) (Jan 24, 2018)

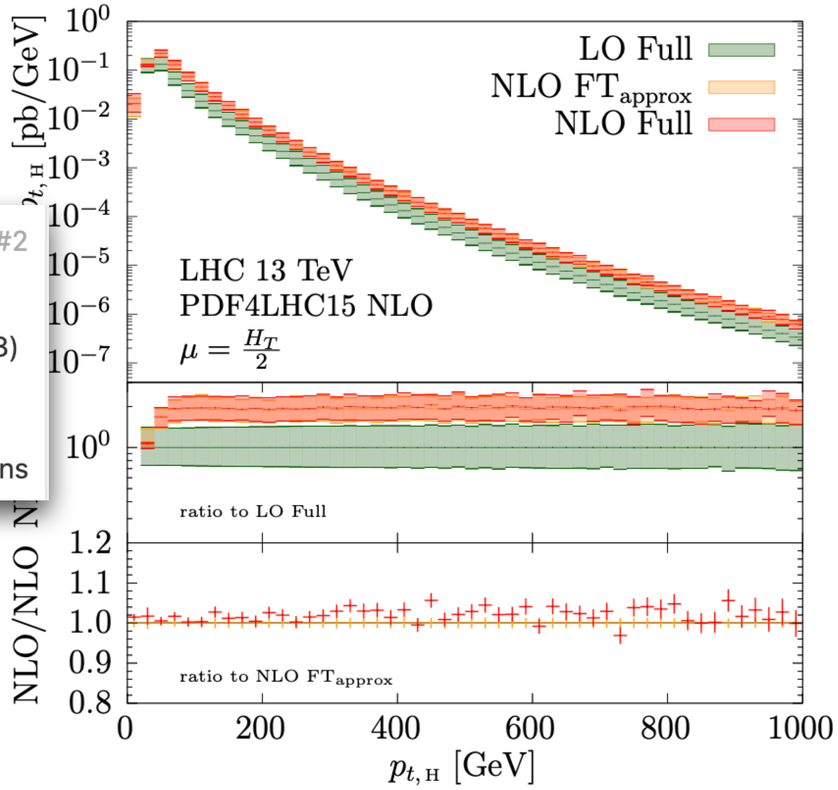
NLO Higgs+jet production at large transverse momenta including top quark mass effects #2

Tobias Neumann (IIT, Chicago and Fermilab) (Feb 8, 2018)

Published in: *J.Phys.Comm.* 2 (2018) 9, 095017 • e-Print: 1802.02981 [hep-ph]

pdf links DOI cite claim

reference search 42 citations

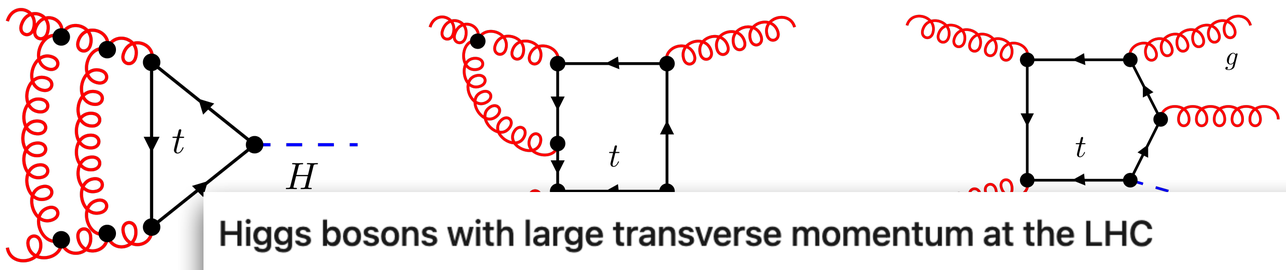


Next-to-Leading-Order QCD Corrections to Higgs Boson Plus Jet Production with Full Top-Quark Mass Dependence #1

S.P. Jones (Munich, Max Planck Inst.), M. Kerner (Munich, Max Planck Inst.), G. Luisoni (Munich, Max Planck Inst.) (Feb 1, 2018)

Published in: *Phys.Rev.Lett.* 120 (2018) 16, 162001, *Phys.Rev.Lett.* 128 (2022) 5, 059901 (erratum) • e-Print: 1802.00349 [hep-ph]

pdf DOI cite claim reference search 104 citations



$p_{T,H} \equiv$

Higgs bosons with large transverse momentum at the LHC #2

Jonas M. Lindert (Durham U., IPPP), Kirill Kudashkin (KIT, Karlsruhe, TTP), Kirill Melnikov (KIT, Karlsruhe, TTP), Christopher Wever (KIT, Karlsruhe, TTP and KIT, Karlsruhe, IKP) (Jan 24, 2018)

NLO Higgs+jet production at large transverse momenta including top quark mass effects #2

Tobias Neumann (IIT, Chicago and Fermilab) (Feb 8, 2018)

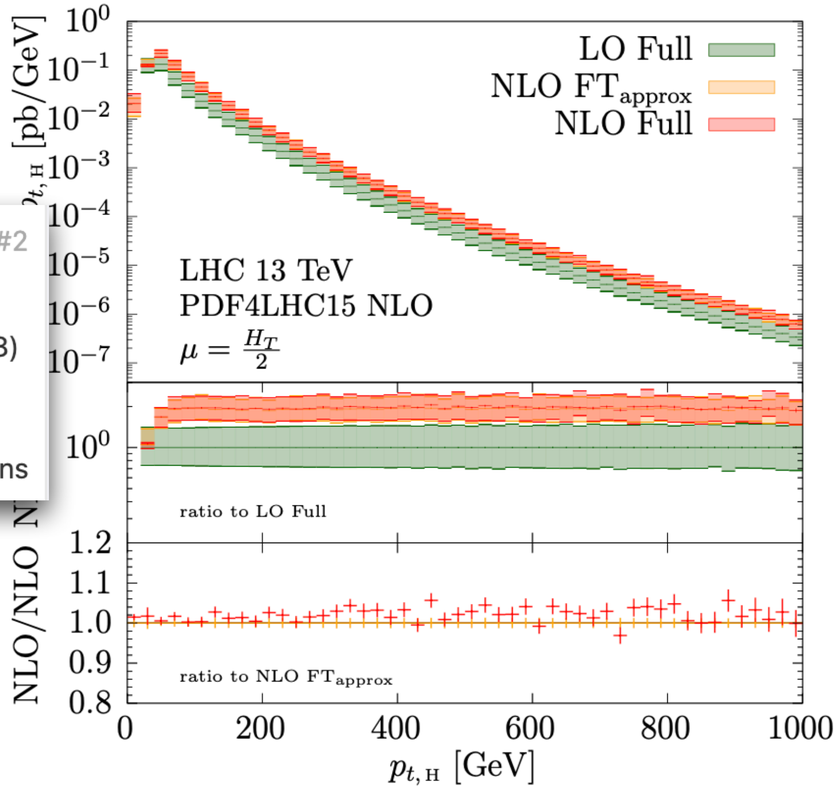
Published in: *J.Phys.Comm.* 2 (2018) 9, 095017 • e-Print: 1802.02981 [hep-ph]

Top-quark mass effects in H+jet and H+2 jets production #8

X. Chen (KIT, Karlsruhe and KIT, Karlsruhe, TP and Zurich U.), A. Huss (CERN), S.P. Jones (Durham U., IPPP), M. Kerner (KIT, Karlsruhe and KIT, Karlsruhe, TP and Zurich U.), J.-N. Lang (Zurich U.) et al. (Oct 13, 2021)

Published in: *JHEP* 03 (2022) 096 • e-Print: 2110.06953 [hep-ph]

pdf DOI cite claim reference search 7 citations

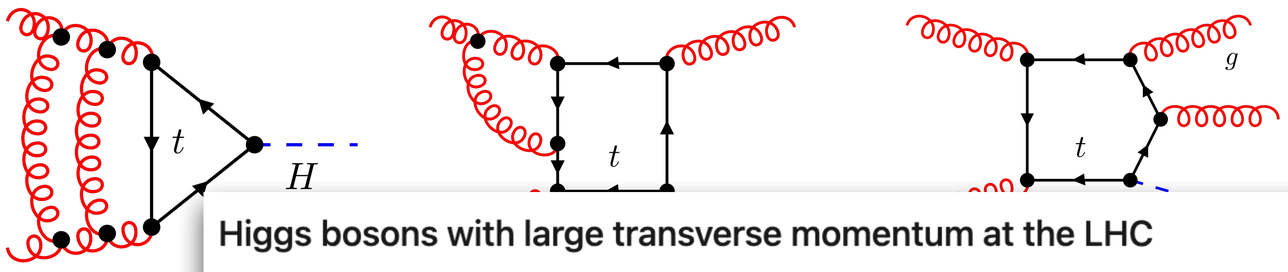


o-Leading-Order QCD Corrections to Higgs Boson Plus Jet ction with Full Top-Quark Mass Dependence #1

S.P. Jones (Munich, Max Planck Inst.), M. Kerner (Munich, Max Planck Inst.), G. Luisoni (Munich, Max Planck Inst.) (Feb 1, 2018)

Published in: *Phys.Rev.Lett.* 120 (2018) 16, 162001, *Phys.Rev.Lett.* 128 (2022) 5, 059901 (erratum) • e-Print: 1802.00349 [hep-ph]

pdf DOI cite claim reference search 104 citations



$p_{T,H} \equiv$

Higgs bosons with large transverse momentum at the LHC #2

Jonas M. Lindert (Durham U., IPPP), Kirill Kudashkin (KIT, Karlsruhe, TTP), Kirill Melnikov (KIT, Karlsruhe, TTP), Christopher Wever (KIT, Karlsruhe, TTP and KIT, Karlsruhe, IKP) (Jan 24, 2018)

NLO Higgs+jet production at large transverse momenta including top quark mass effects #2

Tobias Neumann (IIT, Chicago and Fermilab) (Feb 8, 2018)

Published in: *J.Phys.Comm.* 2 (2018) 9, 095017 • e-Print: 1802.02981 [hep-ph]

Top-quark mass effects in H+jet and H+2 jets production #8

X. Chen (KIT, Karlsruhe and KIT, Karlsruhe, TP and Zurich U.), A. Huss (CERN), S.P. Jones (Durham U., IPPP), M. Kerner (KIT, Karlsruhe and KIT, Karlsruhe, TP and Zurich U.), J.-N. Lang (Zurich U.) et al. (Oct 13, 2021)

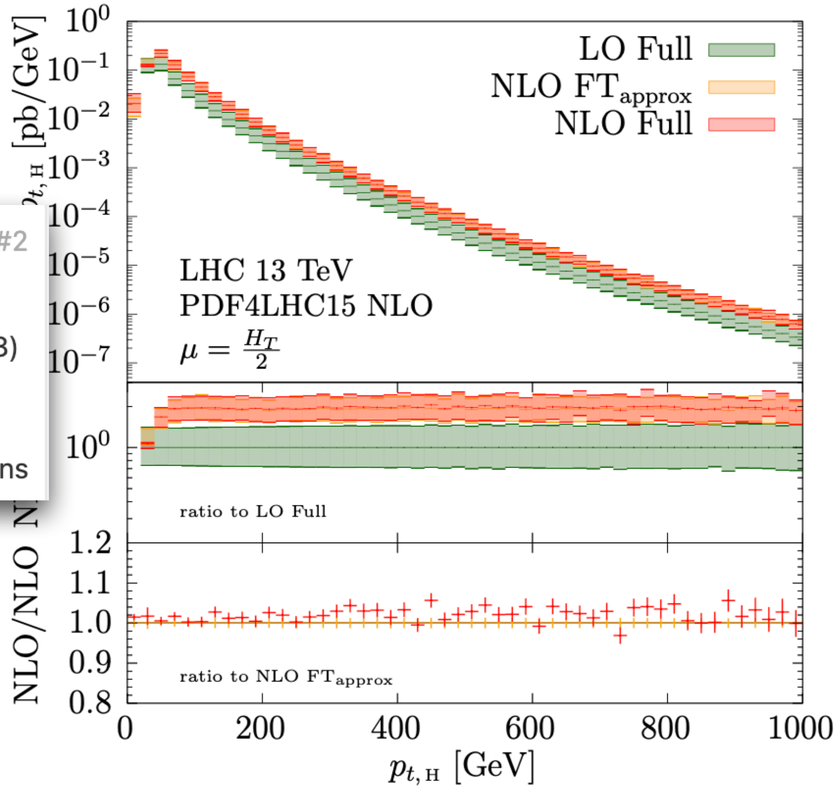
Published in: *JHEP* 03 (2022) 096 • e-Print: 2110.06953 [hep-ph]

Next-to-leading-order QCD Corrections to Higgs Production in association with a Jet #3

R. Bonciani (Rome U.), V. Del Duca (INFN, Rome and Zurich U. and Frascati), H. Frellesvig (Bohr Inst.), M. Hidding (Uppsala U.), V. Hirschi (CERN) et al. (Jun 21, 2022)

e-Print: 2206.10490 [hep-ph]

pdf cite claim reference search 3 citations



o-Leading-Order QCD Corrections to Higgs Boson Plus Jet ction with Full Top-Quark Mass Dependence #1

S.P. Jones (Munich, Max Planck Inst.), M. Kerner (Munich, Max Planck Inst.), G. Luisoni (Munich, Max Planck Inst.) (Feb 1, 2018)

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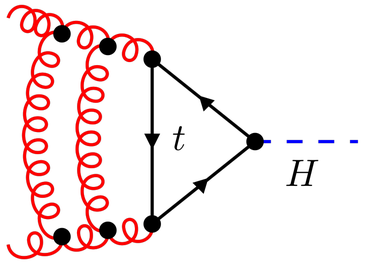
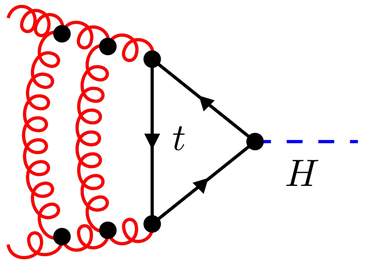


δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$^{+0.10\text{ pb}}_{-1.15\text{ pb}}$	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
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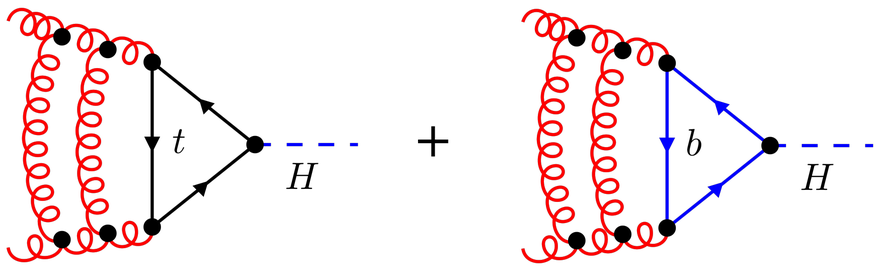
LHCH(XS)WG YR4 '16



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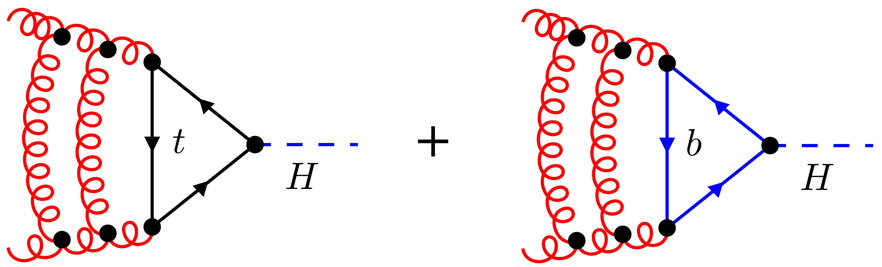
LHCH(XS)WG YR4 '16



$$\frac{\alpha_s}{\pi} \ln^2 \frac{m_b^2}{M_H^2} \approx 1.3$$

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
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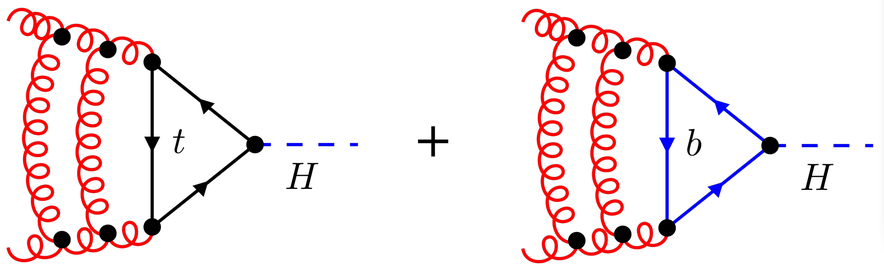
LHCH(XS)WG YR4 '16



On the light quark mass effects in Higgs boson production in gluon fusion #2

Kirill Melnikov (Karlsruhe U., TTP), Alexander Penin (Alberta U. and Karlsruhe U., TTP) (Feb 29, 2016)

Published in: *JHEP* 05 (2016) 172 • e-Print: 1602.09020 [hep-ph]

pdf DOI cite claim reference search 38 citations

$$\frac{\alpha_s}{\pi}\ln^2\frac{m_b^2}{M_H^2}\approx 1.3$$

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
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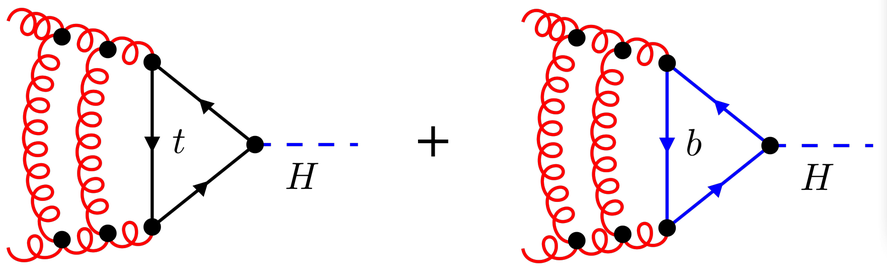
LHCH(XS)WG YR4 '16



$$\frac{\alpha_s}{\pi} \ln^2 \frac{m_b^2}{M_H^2} \approx 1.3$$

On the light quark mass effects in Higgs boson production in gluon fusion #2

Kirill Melnikov (Karlsruhe U., TTP), Alexander Penin (Alberta U. and Karlsruhe U., TTP) (Feb 29, 2016)

Published in: *JHEP* 05 (2016) 172 • e-Print: 1602.09020 [hep-ph]

Bottom-quark effects in Higgs production at intermediate transverse momentum #18

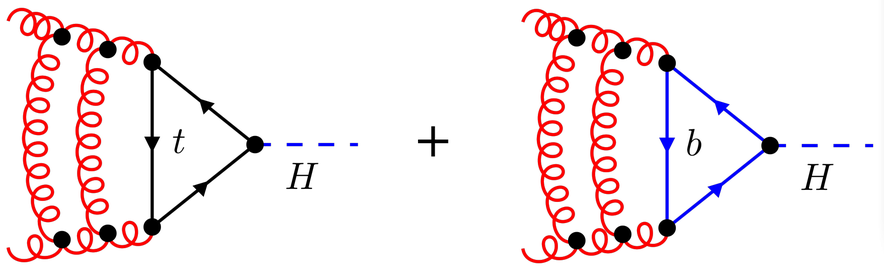
Fabrizio Caola (Durham U., IPPP), Jonas M. Lindert (Durham U., IPPP), Kirill Melnikov (KIT, Karlsruhe, TTP), Pier Francesco Monni (CERN), Lorenzo Tancredi (CERN) et al. (Apr 20, 2018)

Published in: *JHEP* 09 (2018) 035 • e-Print: 1804.07632 [hep-ph]

pdf DOI cite claim reference search 27 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$^{+0.10\text{ pb}}_{-1.15\text{ pb}}$	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



$$\frac{\alpha_s}{\pi} \ln^2 \frac{m_b^2}{M_H^2} \approx 1.3$$

On the light quark mass effects in Higgs boson production in gluon fusion #2

Kirill Melnikov (Karlsruhe U., TTP), Alexander Penin (Alberta U. and Karlsruhe U., TTP) (Feb 29, 2016)

Published in: *JHEP* 05 (2016) 172 • e-Print: 1602.09020 [hep-ph]

Bottom-quark effects in Higgs production at intermediate transverse momentum #18

Fabrizio Caola (Durham U., IPPP), Jonas M. Lindert (Durham U., IPPP), Kirill Melnikov (KIT, Karlsruhe, TTP), Pier Francesco Monni (CERN), Lorenzo Tancredi (CERN) et al. (Apr 20, 2018)

Published in: *JHEP* 09 (2018) 035 • e-Print: 1804.07632 [hep-ph]

Light Quark Mediated Higgs Boson Threshold Production in the Next-to-Leading Logarithmic Approximation #73

Charalampos Anastasiou (Alberta U.), Alexander Penin (Zurich, ETH) (Apr 7, 2020)

Published in: *JHEP* 07 (2020) 195, *JHEP* 01 (2021) 164 (erratum) • e-Print: 2004.03602 [hep-ph]

pdf DOI cite claim reference search 17 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
$+0.10$ pb -1.15 pb	± 0.18 pb	± 0.56 pb	± 0.49 pb	± 0.40 pb	± 0.49 pb
$+0.21\%$ -2.37%	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16

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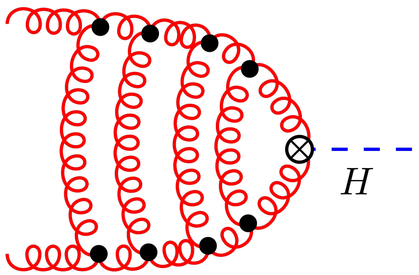
$^{+0.21\%}_{-2.37\%}$	$\pm 0.37\%$	$\pm 1.16\%$	$\pm 1\%$	$\pm 0.83\%$	$\pm 1\%$

LHCH(XS)WG YR4 '16



δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
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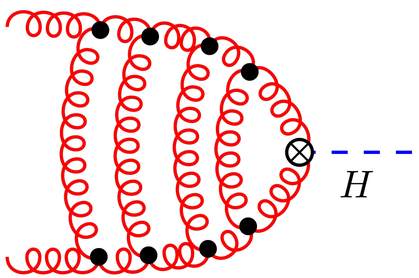
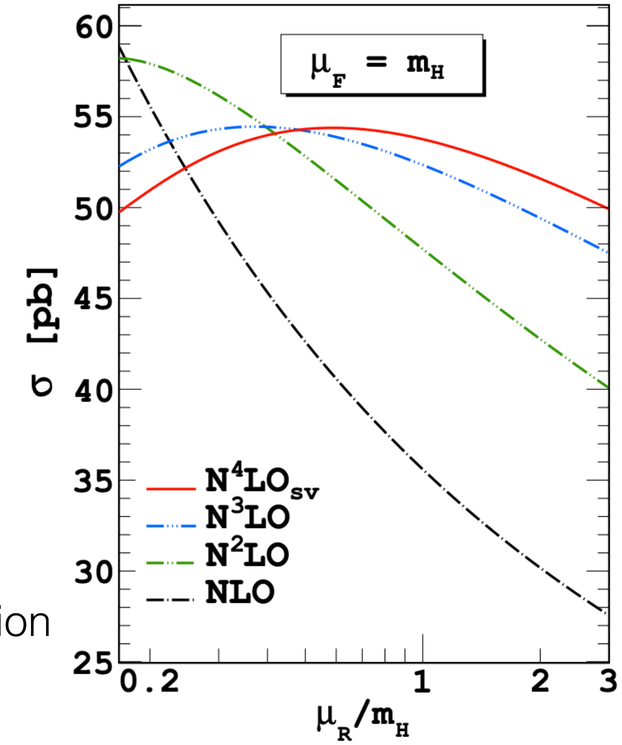
LHCH(XS)WG YR4 '16



soft-virtual approximation



Approximate four-loop QCD corrections to the Higgs-boson production cross section #1

G. Das (Siegen U.), S. Moch (Hamburg U., Inst. Theor. Phys. II), A. Vogt (Liverpool U., Dept. Math.) (Apr 1, 2020)

Published in: *Phys.Lett.B* 807 (2020) 135546 • e-Print: 2004.00563 [hep-ph]

pdf DOI cite claim reference search 20 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
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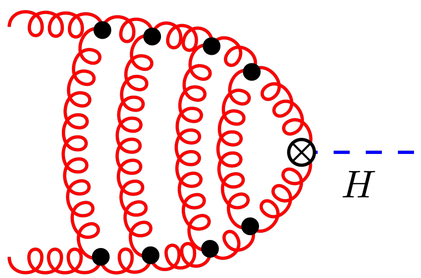
LHCH(XS)WG YR4 '16



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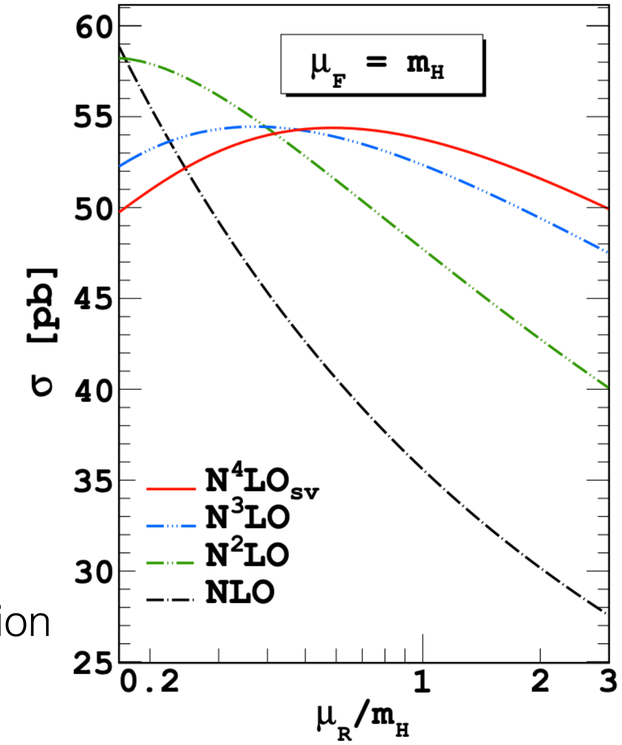

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Published in: *Phys.Lett.B* 807 (2020) 135546 • e-Print: 2004.00563 [hep-ph]

Planar master integrals for four-loop form factors #22

Andreas von Manteuffel (Michigan State U.), Robert M. Schabinger (Michigan State U.) (Mar 14, 2019)

Published in: *JHEP* 05 (2019) 073 • e-Print: 1903.06171 [hep-ph]

pdf DOI cite claim reference search 17 citations

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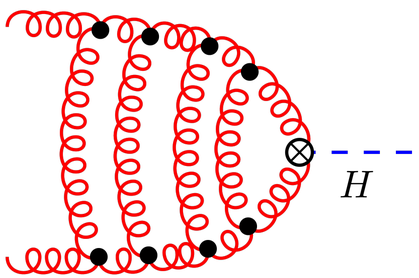
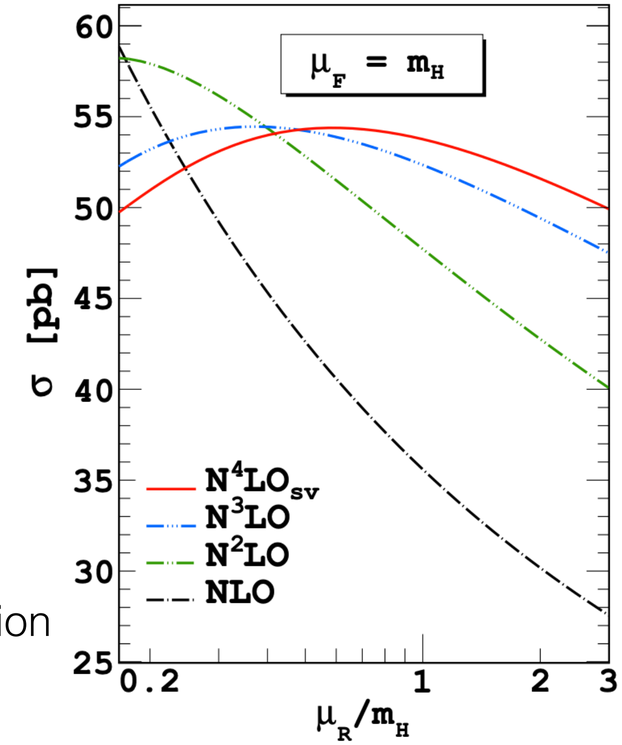
LHCH(XS)WG YR4 '16



soft-virtual approximation



Approximate four-loop QCD corrections to the Higgs-boson production cross section #1

G. Das (Siegen U.), S. Moch (Hamburg U., Inst. Theor. Phys. II), A. Vogt (Liverpool U., Dept. Math.) (Apr 1, 2020)

Published in: *Phys.Lett.B* 807 (2020) 135546 • e-Print: 2004.00563 [hep-ph]

Planar master integrals for four-loop form factors #22

Andreas von Manteuffel (Michigan State U.), Robert M. Schabinger (Michigan State U.) (Mar 14, 2019)

Published in: *JHEP* 05 (2019) 073 • e-Print: 1903.06171 [hep-ph]

Quark and Gluon Form Factors in Four-Loop QCD #3

Roman N. Lee (Novosibirsk, IYF), Andreas von Manteuffel (Michigan State U.), Robert M. Schabinger (Michigan State U.), Alexander V. Smirnov (Lomonosov Moscow State U. and Unlisted, RU), Vladimir A. Smirnov (SINP, Moscow and Unlisted, RU) et al. (Feb 9, 2022)

Published in: *Phys.Rev.Lett.* 128 (2022) 21, 212002 • e-Print: 2202.04660 [hep-ph]

pdf DOI cite claim reference search 17 citations

δ(scale)	δ(trunc)	δ(PDF-TH)	δ(EW)	$\delta(t,b,c)$	$\delta(1/m_t)$
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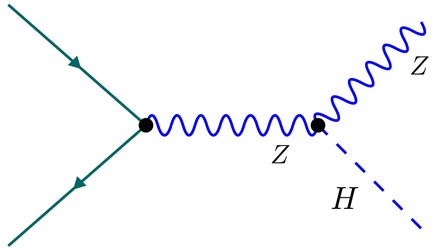
LHCH(XS)WG YR4 '16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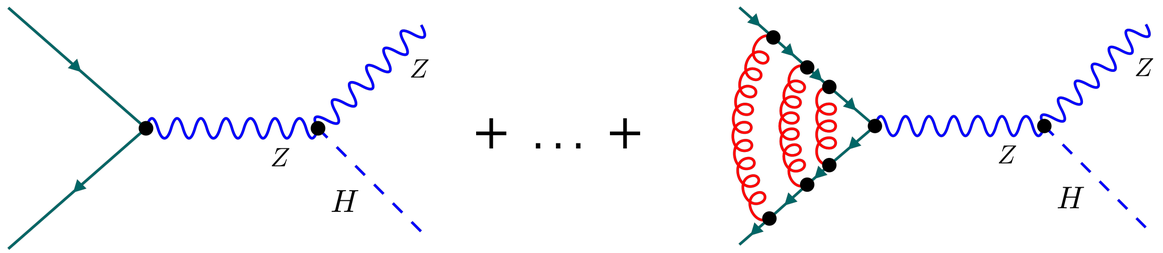
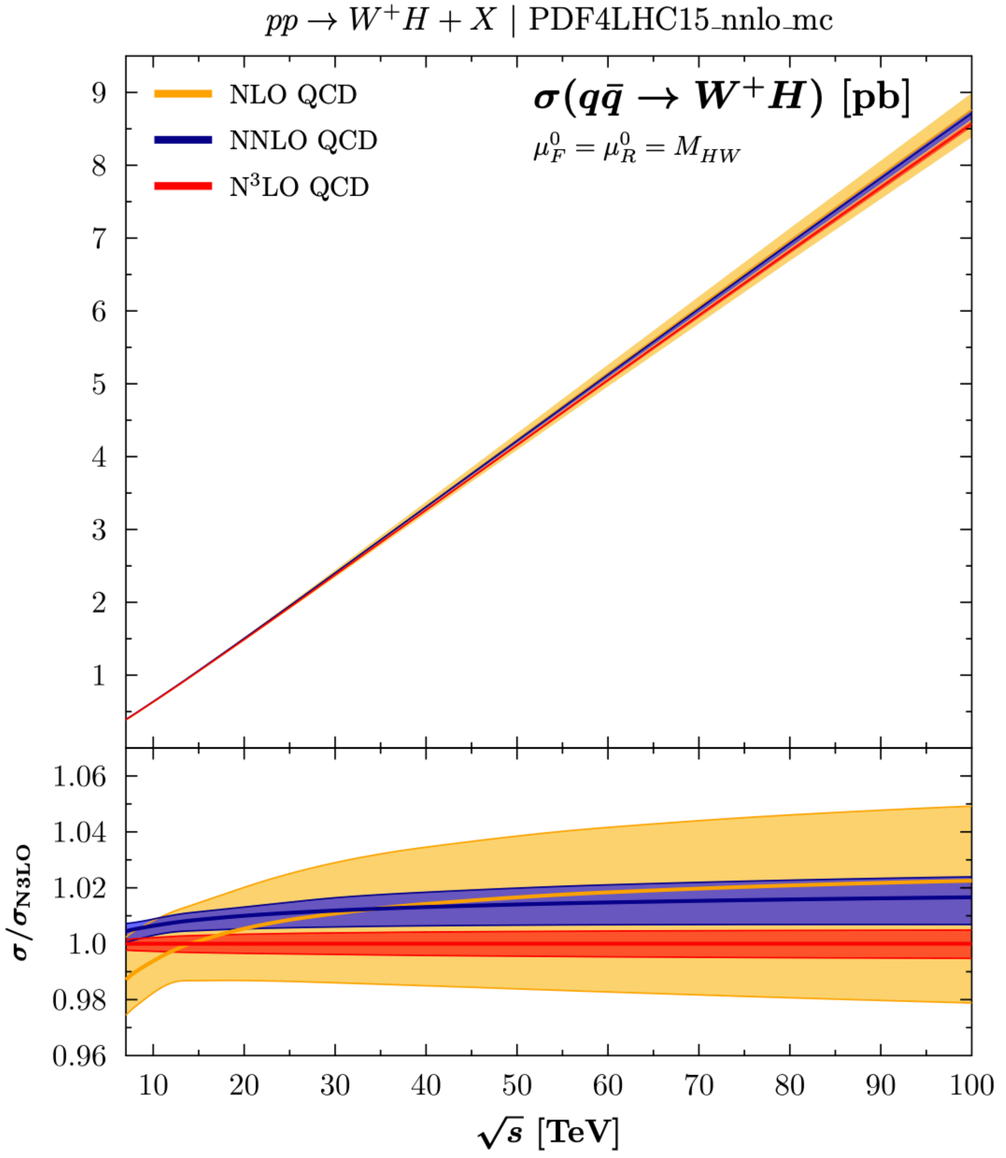


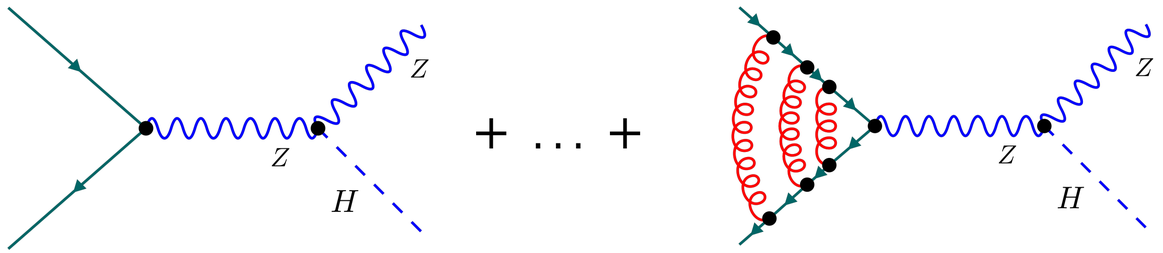
Inclusive Production Cross Sections at N3LO #2

Julien Baglio (CERN), Claude Duhr (U. Bonn, Phys. Inst., BCTP), Bernhard Mistlberger (SLAC), Robert Szafron (Brookhaven) (Sep 13, 2022)

e-Print: 2209.06138 [hep-ph]

pdf cite claim reference search 1 citation





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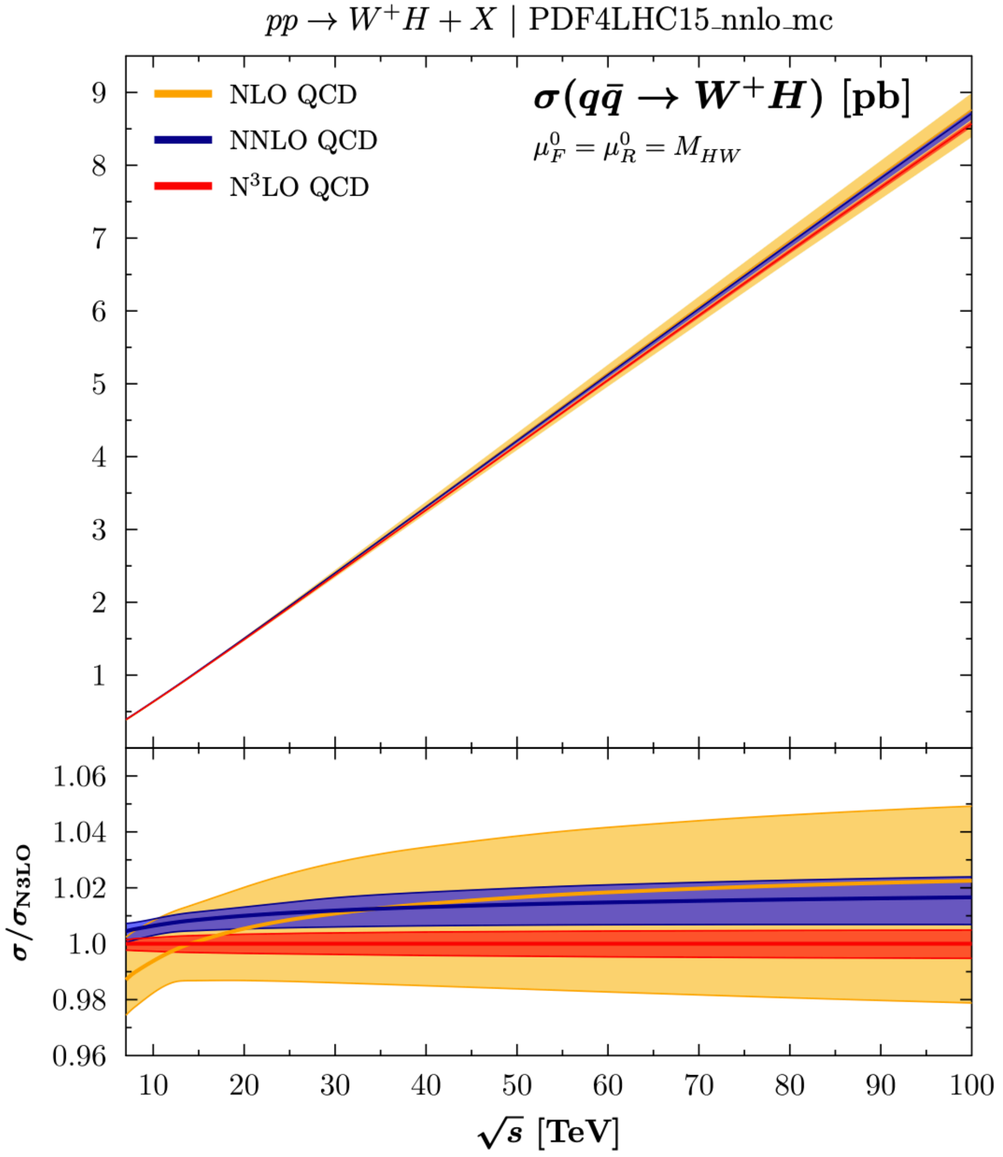
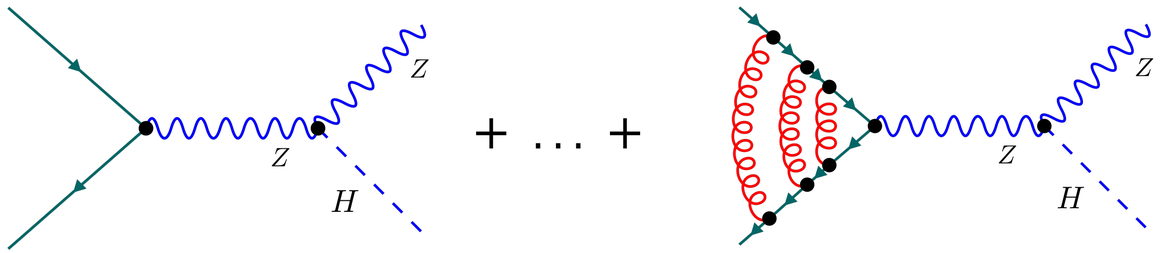
Julien Baglio (CERN), Claude Duhr (U. Bonn, Phys. Inst., BCTP), Bernhard Mistlberger (SLAC), Robert Szafron (Brookhaven) (Sep 13, 2022)

NNLO QCD corrections to associated WH production and $H \to b\bar{b}$ decay #59

Fabrizio Caola (Durham U., IPPP), Gionata Luisoni (Munich, Max Planck Inst.), Kirill Melnikov (KIT, Karlsruhe, TTP), Raoul Röntsch (KIT, Karlsruhe, TTP) (Dec 19, 2017)

Published in: *Phys.Rev.D* 97 (2018) 7, 074022 • e-Print: 1712.06954 [hep-ph]





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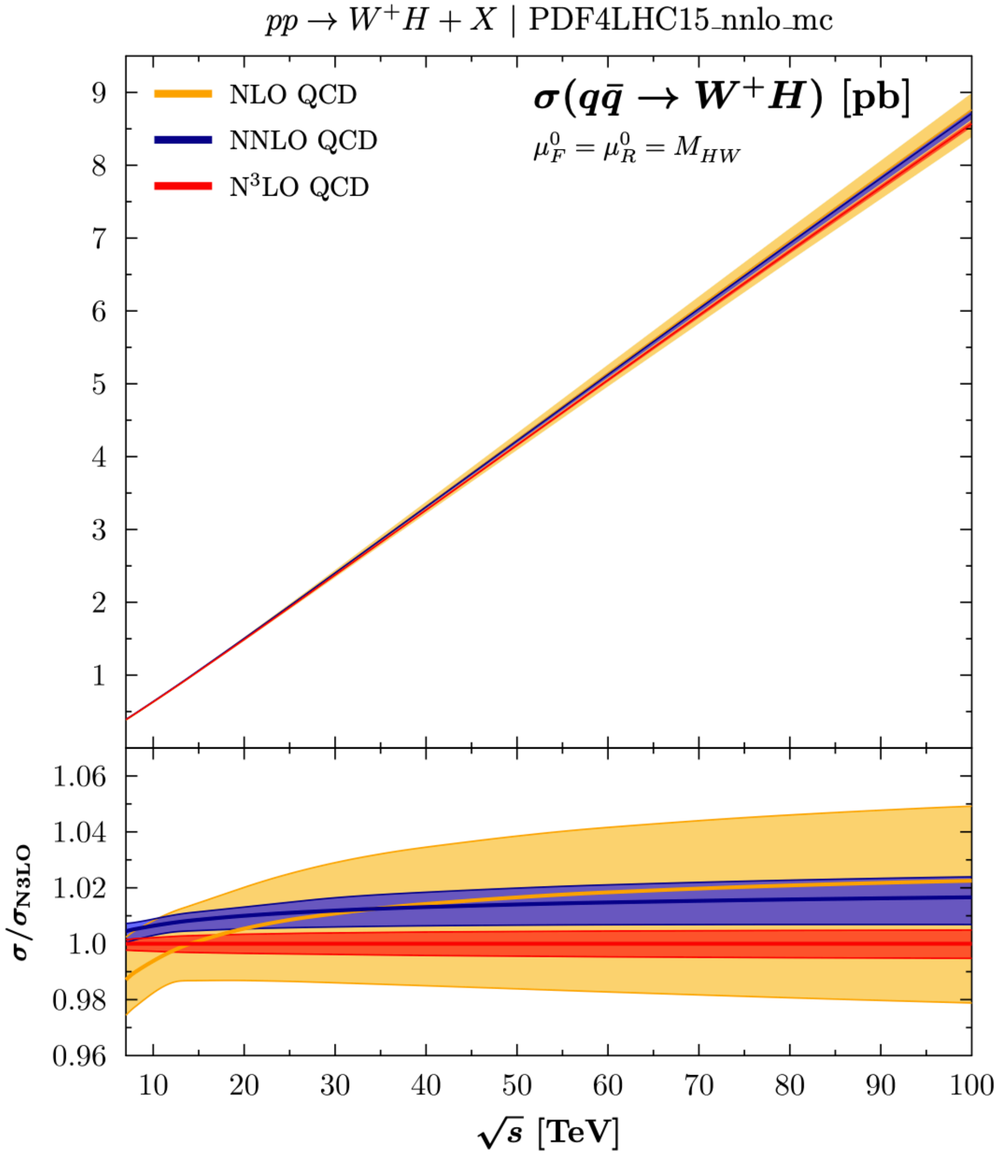
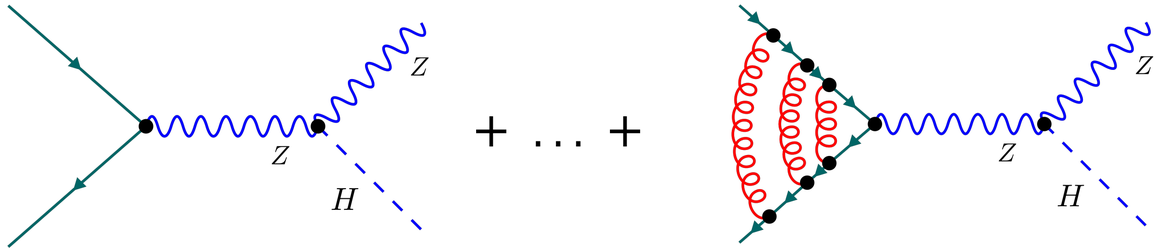
Associated production of a Higgs boson decaying into bottom quarks at the LHC in full NNLO QCD #65

Giancarlo Ferrera (Milan U. and INFN, Milan), Gábor Somogyi (Debrecen U. and MTA-DE, Debrecen), Francesco Tramontano (Naples U. and INFN, Naples) (May 29, 2017)

Published in: *Phys.Lett.B* 780 (2018) 346-351 • e-Print: 1705.10304 [hep-ph]





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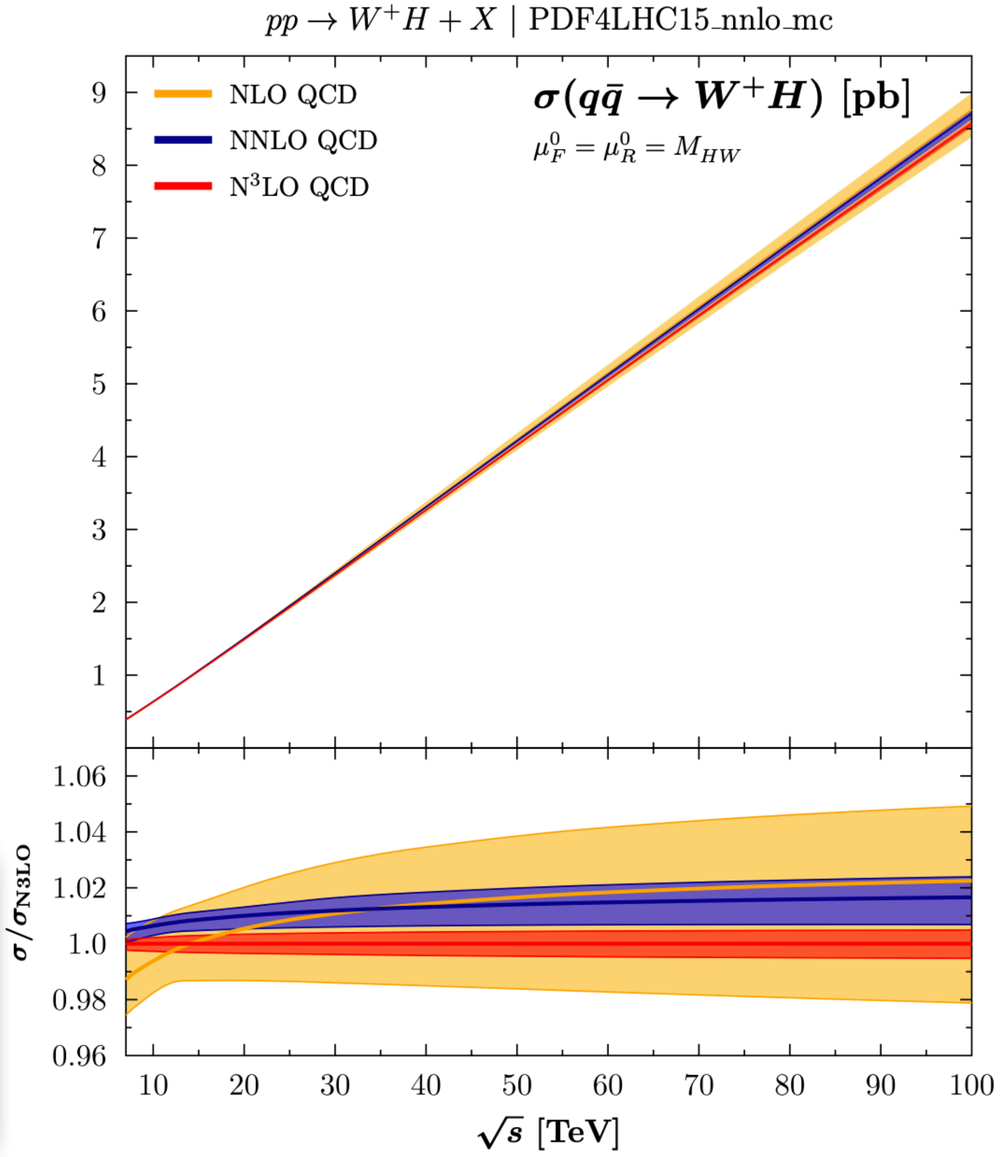
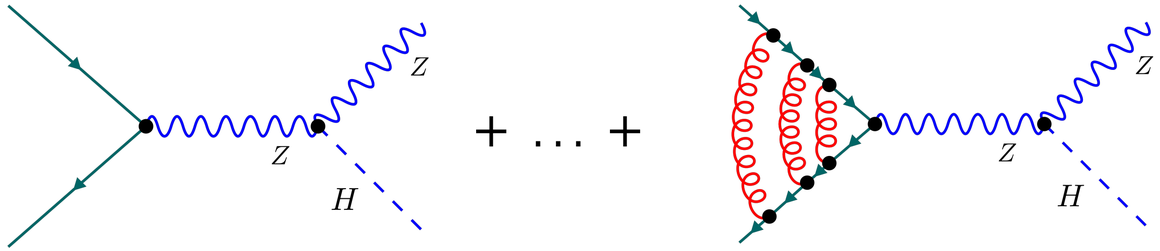
Bottom quark mass effects in associated WH production with the $H \to b\bar{b}$ decay through NNLO QCD #28

Arnd Behring (KIT, Karlsruhe), Wojciech Bizoń (Karlsruhe U., ITP and KIT, Karlsruhe), Fabrizio Caola (Oxford U., Theor. Phys.), Kirill Melnikov (Karlsruhe U., ITP), Raoul Röntsch (CERN) (Mar 18, 2020)

Published in: *Phys.Rev.D* 101 (2020) 11, 114012 • e-Print: 2003.08321 [hep-ph]





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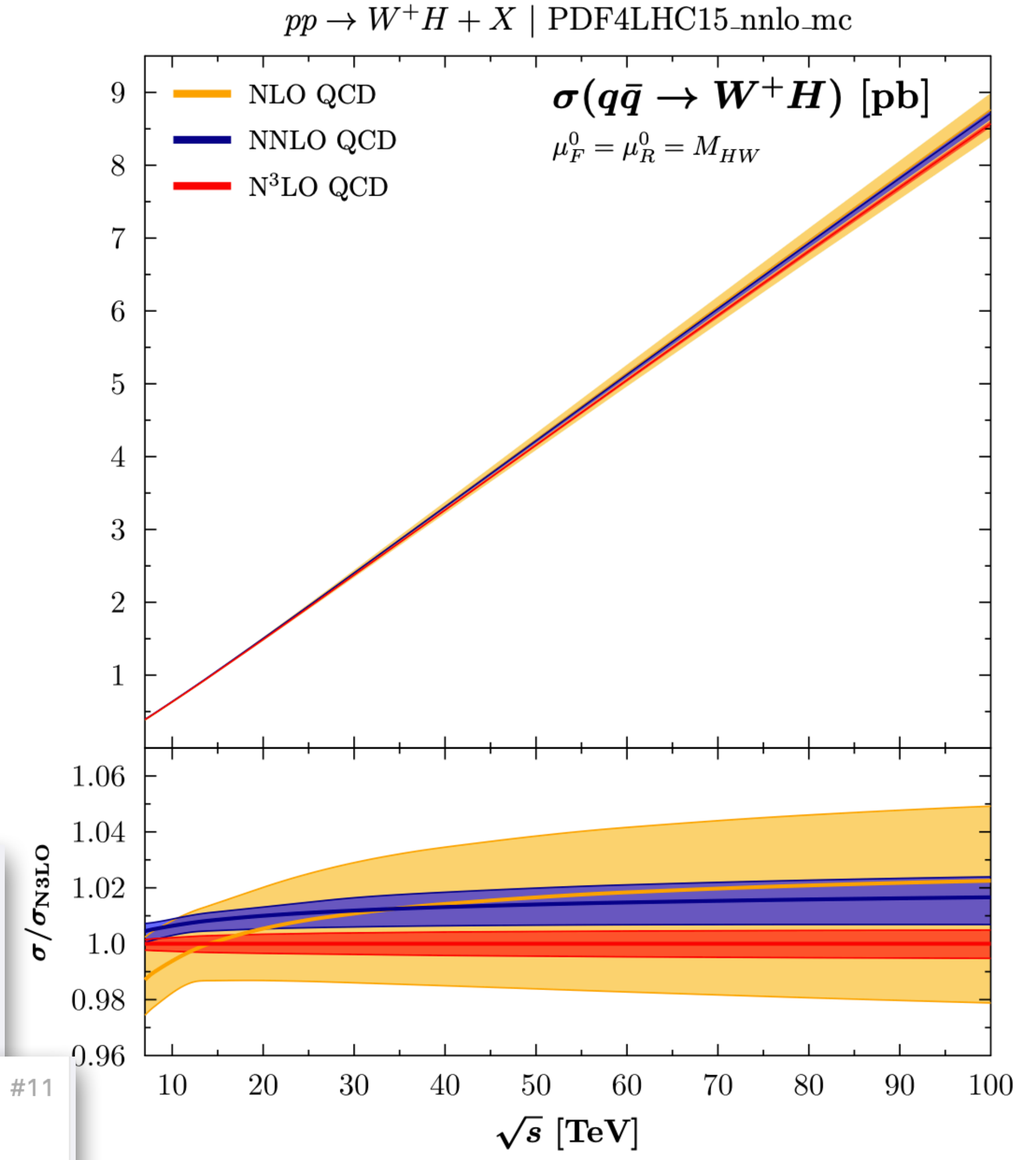
VH + jet production in hadron-hadron collisions up to order α_s^3 in perturbative QCD #11

R. Gauld (Nikhef, Amsterdam and Bonn U.), A. Gehrmann-De Ridder (Zurich, ETH and Zurich U.), E.W. N. Glover (Durham U., IPPP and Durham U.), A. Huss (CERN), I. Majer (Zurich, ETH) (Oct 25, 2021)

Published in: *JHEP* 03 (2022) 008 • e-Print: 2110.12992 [hep-ph]



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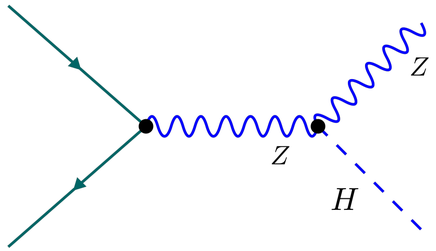
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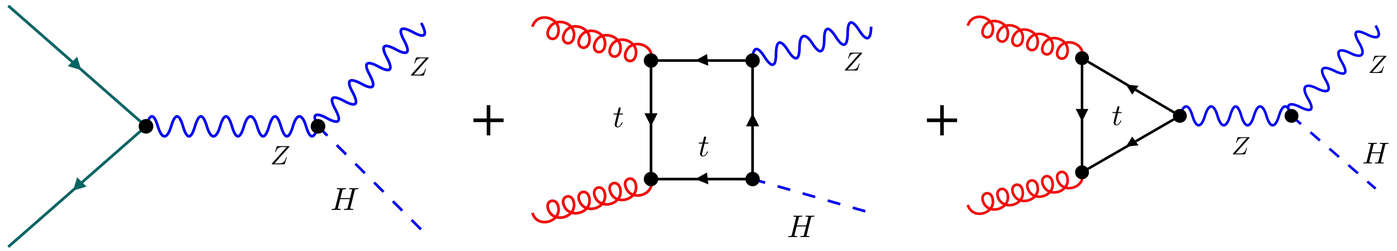
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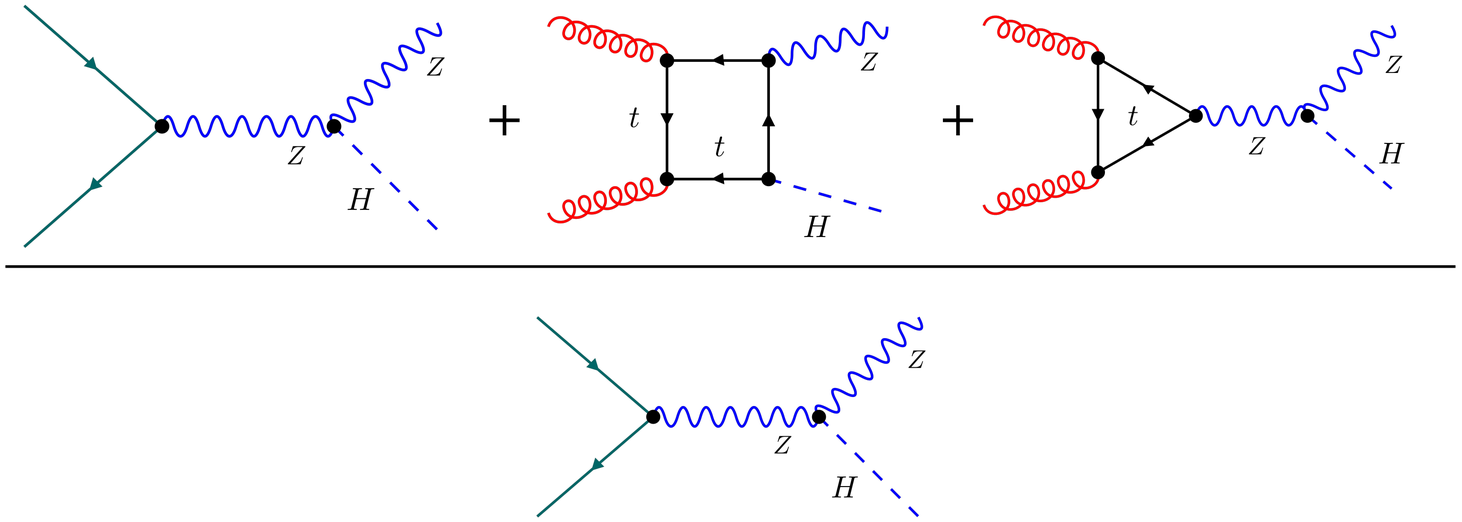

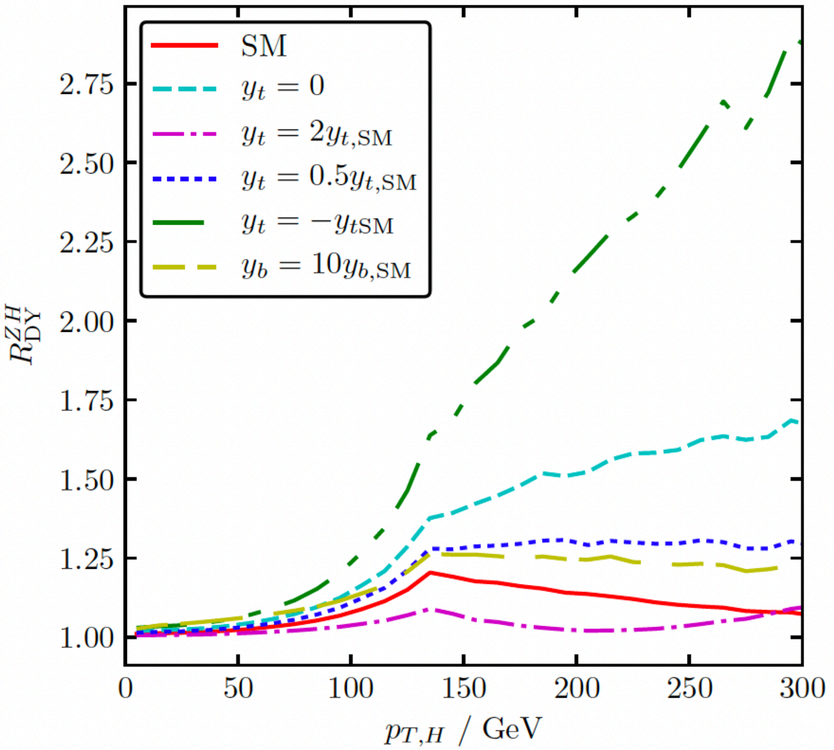

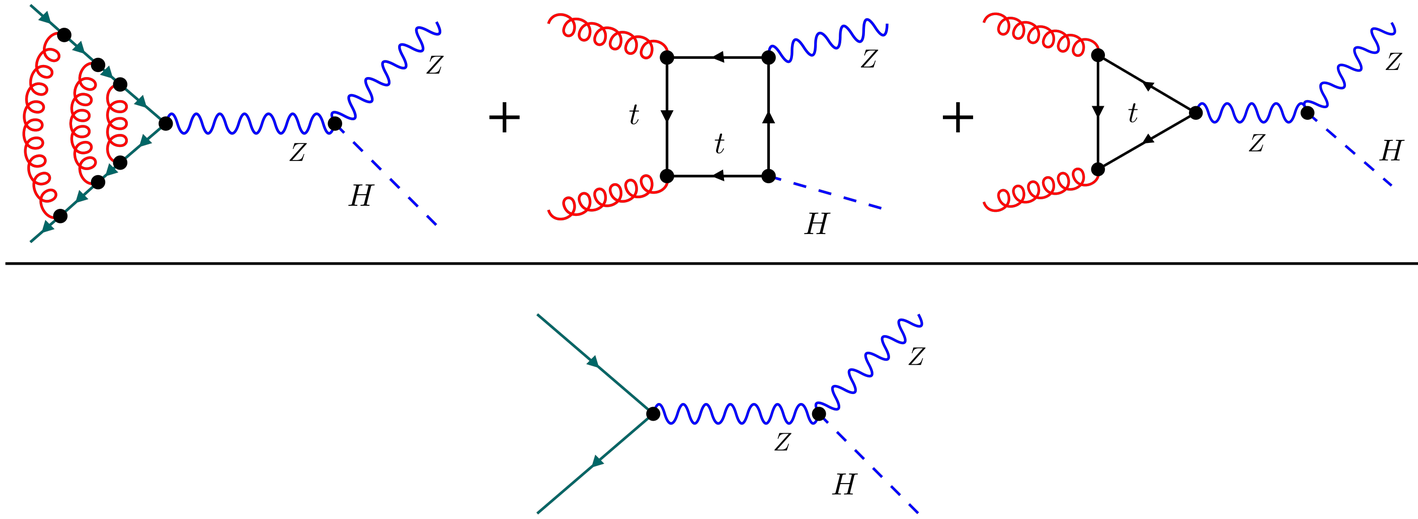

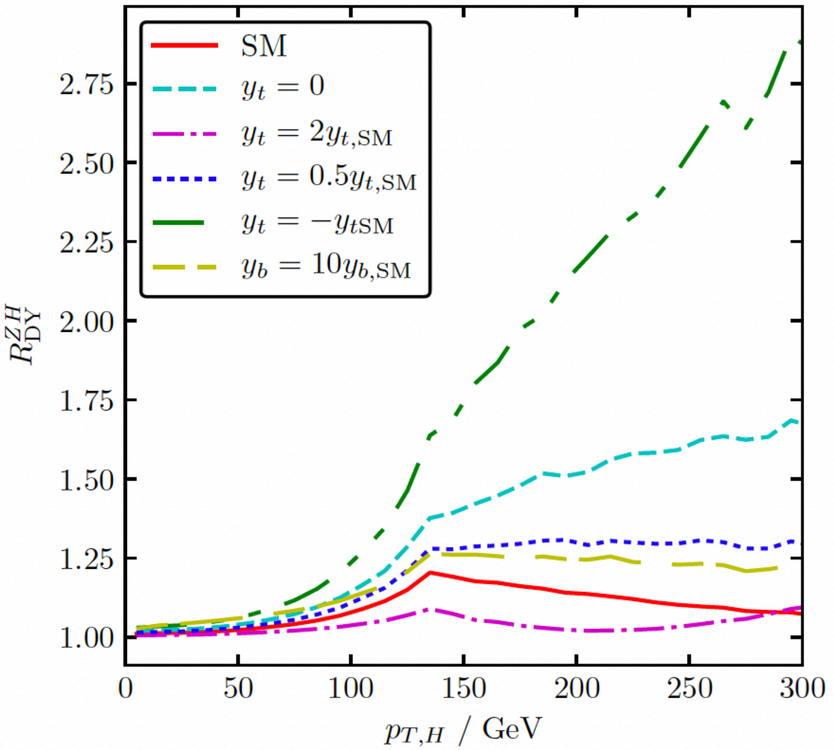

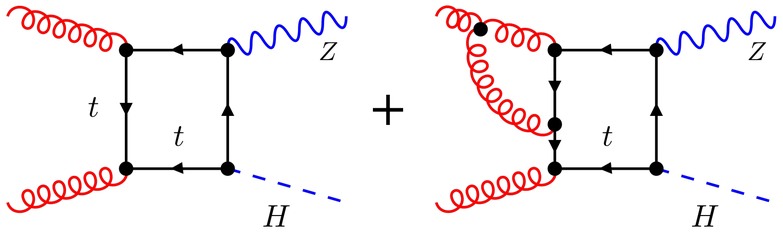
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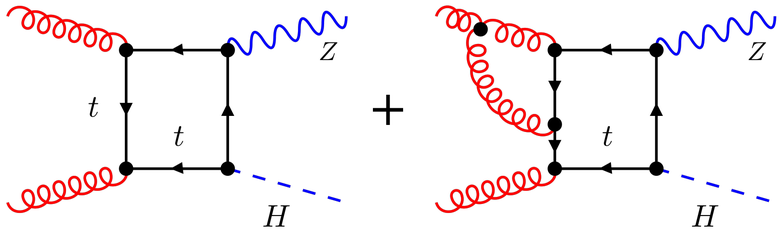
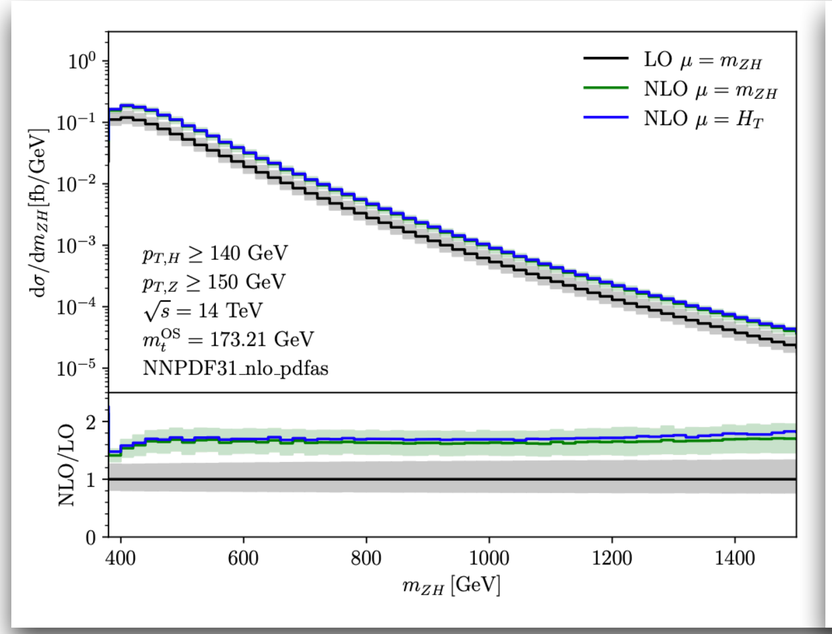
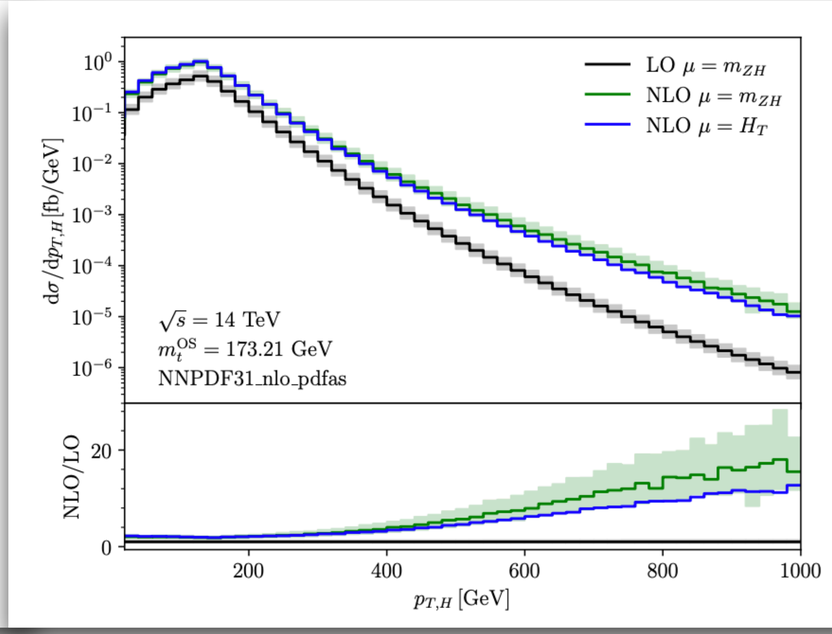






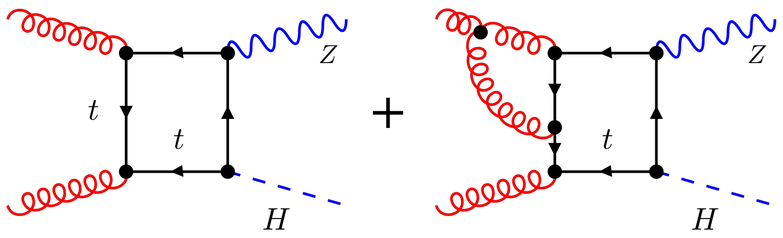
ZH production in gluon fusion at NLO in QCD

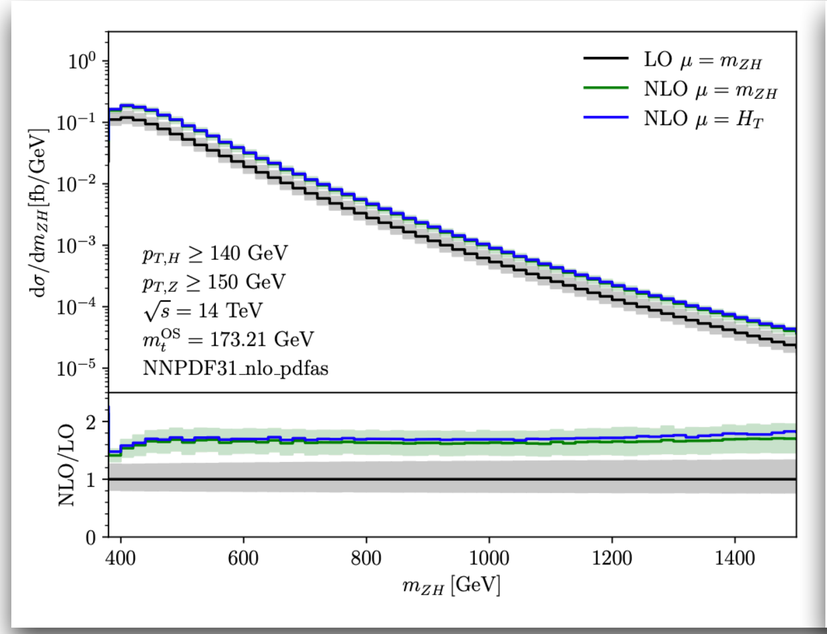
#1

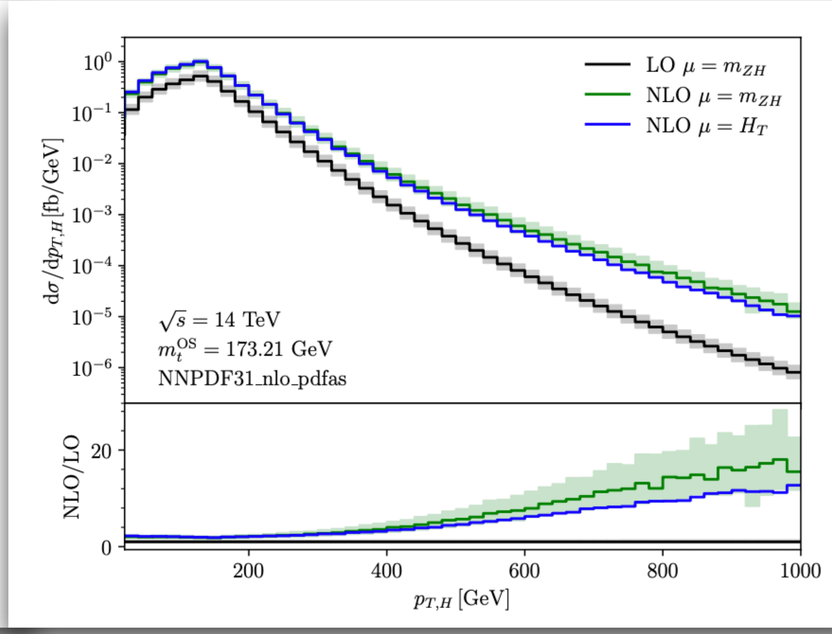
Long Chen (RWTH Aachen U. and Shandong U.), Joshua Davies (Sussex U.), Gudrun Heinrich (KIT, Karlsruhe), Stephen P. Jones (Durham U., IPPP), Matthias Kerner (KIT, Karlsruhe and KIT, Karlsruhe, IKP) et al. (Apr 11, 2022)

Published in: *JHEP* 08 (2022) 056 • e-Print: 2204.05225 [hep-ph]

pdf DOI cite claim reference search 7 citations







ZH production in gluon fusion at NLO in QCD #1

Long Chen (RWTH Aachen U. and Shandong U.), Joshua Davies (Sussex U.), Gudrun Heinrich (KIT, Karlsruhe), Stephen P. Jones (Durham U., IPPP), Matthias Kerner (KIT, Karlsruhe and KIT, Karlsruhe, IKP) et al. (Apr 11, 2022)

6 • e-Print: 2204.05225 [hep-ph]

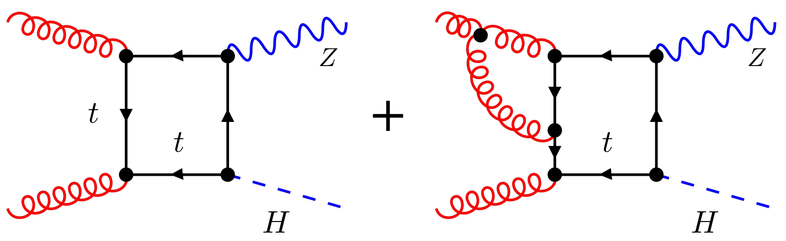
claim reference search 7 citations

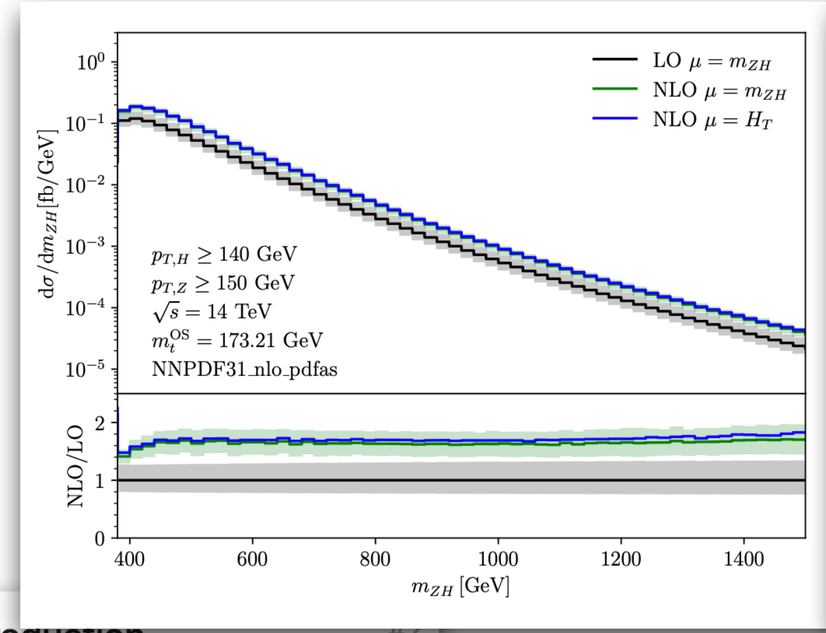
Next-to-leading order corrections for gg→ZH with top quark mass dependence #10

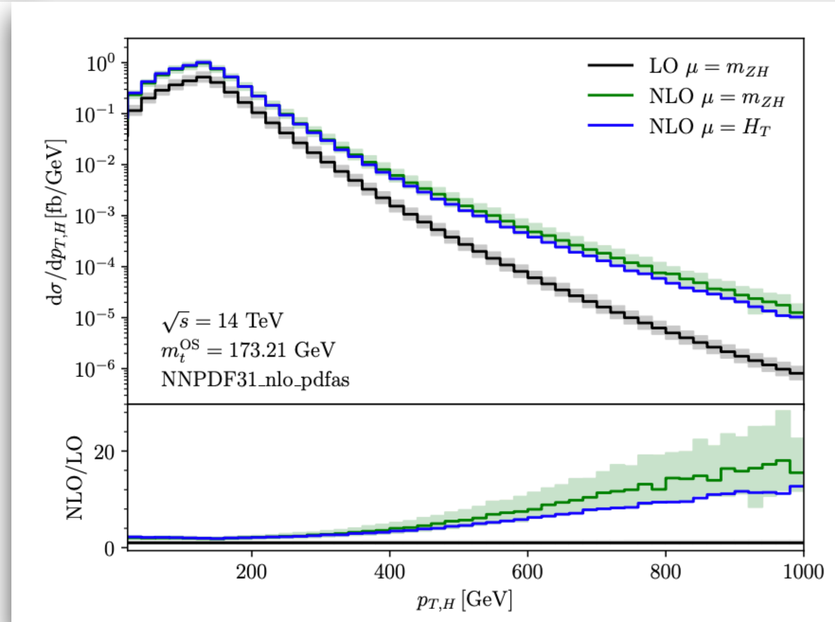
Guoxing Wang (Zhejiang U., Inst. Mod. Phys.), Xiaofeng Xu (Bern U.), Yongqi Xu (Peking U. and Peking U., SKLNPT), Li Lin Yang (Zhejiang U., Inst. Mod. Phys.) (Jul 17, 2021)

Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

pdf DOI cite claim reference search 11 citations







On the NLO QCD corrections to gluon-initiated ZH production

#2

Giuseppe Degrassi (CERN and Rome III U. and INFN, Rome3), Ramona Gröber (Padua U. and INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3), Xiaoran Zhao (Rome III U. and INFN, Rome3) (May 5, 2022)

Published in: *JHEP* 08 (2022) 009 • e-Print: 2205.02769 [hep-ph]

pdf DOI cite claim reference search 4 citations

dependence

Guoxing Wang (Zhejiang U., Inst. Mod. Phys.), Xiaofeng Xu (Bern U.), Yongqi Xu (Peking U. and Peking U., SKLNPT), Li Lin Yang (Zhejiang U., Inst. Mod. Phys.) (Jul 17, 2021)

Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

pdf DOI cite claim reference search 11 citations

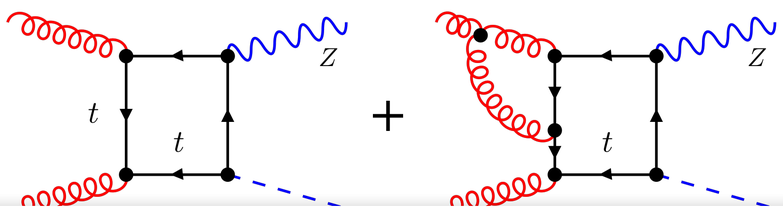
…usion at NLO in QCD

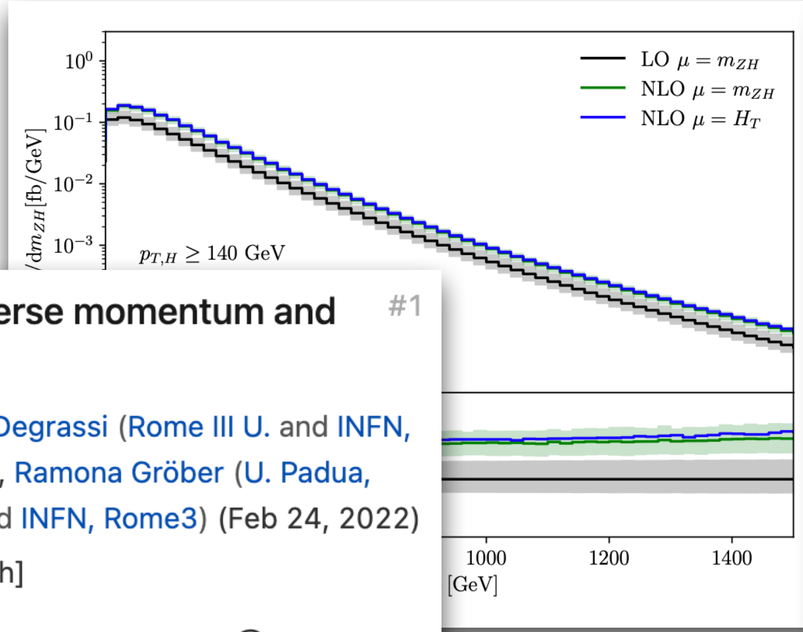
#1

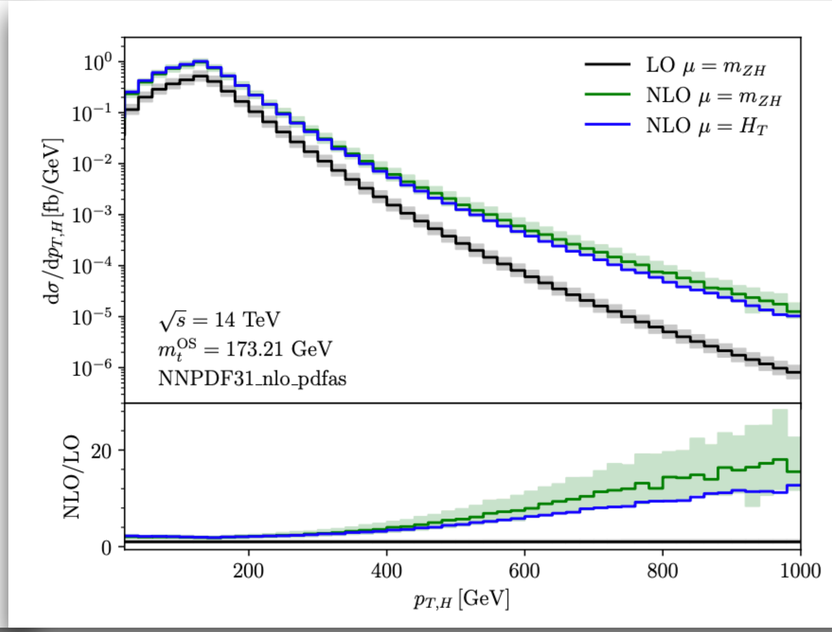
…and Shandong U.), Joshua Davies (Sussex U.), Gudrun …hen P. Jones (Durham U., IPPP), Matthias Kerner (KIT, Karlsruhe …(Apr 11, 2022)

…0 6 • e-Print: 2204.05225 [hep-ph]

claim reference search 7 citations







Gluon fusion production at NLO: merging the transverse momentum and the high-energy expansions

#1

Luigi Bellafronte (Santiago de Compostela U., IGFAE), Giuseppe Degrassi (Rome III U. and INFN, Rome3), Pier Paolo Giardino (Santiago de Compostela U., IGFAE), Ramona Gröber (U. Padua, Dept. Phys. Astron. and INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3) (Feb 24, 2022)

Published in: *JHEP* 07 (2022) 069 • e-Print: 2202.12157 [hep-ph]

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Giuseppe Degrassi (CERN and Rome III U. and INFN, Rome3), Ramona Gröber (Padua U. and INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3), Xiaoran Zhao (Rome III U. and INFN, Rome3) (May 5, 2022)

Published in: *JHEP* 08 (2022) 009 • e-Print: 2205.02769 [hep-ph]

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Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

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6 • e-Print: 2204.05225 [hep-ph]

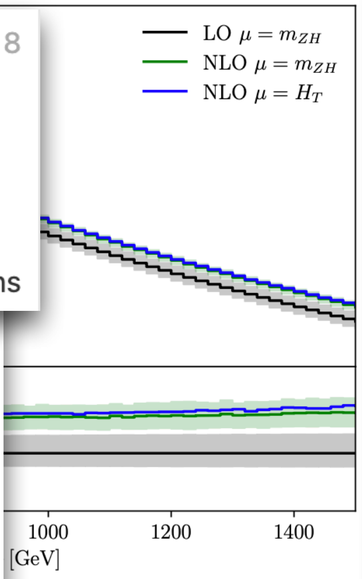
claim reference search 7 citations

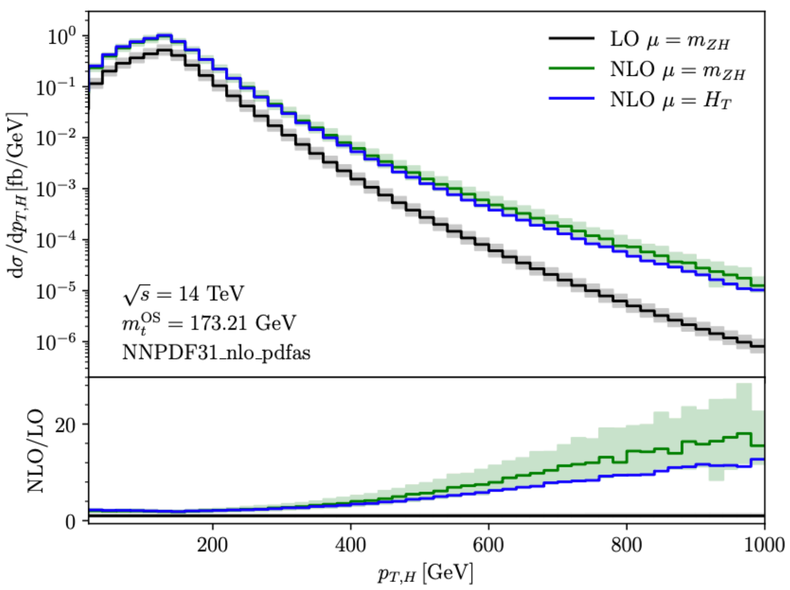
Virtual corrections to $gg \to ZH$ in the high-energy and large-m_t limits #18

Joshua Davies (Sussex U.), Go Mishima (Tohoku U.), Matthias Steinhauser (Karlsruhe U., TTP) (Nov 24, 2020)

Published in: *JHEP* 03 (2021) 034 • e-Print: 2011.12314 [hep-ph]

pdf DOI cite claim reference search 17 citations





the high-energy expansions

Luigi Bellafronte (Santiago de Compostela U., IGFAE), Giuseppe Degrassi (Rome III U. and INFN, Rome3), Pier Paolo Giardino (Santiago de Compostela U., IGFAE), Ramona Gröber (U. Padua, Dept. Phys. Astron. and INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3) (Feb 24, 2022)

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Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

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Virtual corrections to $gg \to ZH$ in the high-energy and large-m_t limits #18

Joshua Davies (Sussex U.), Go Mis... (Nov 24, 2020)

Published in: *JHEP* 03 (2021) 034

pdf DOI cite

ZH production in gluon fusion: two-loop amplitudes with full top quark mass dependence #17

Long Chen (Munich, Max Planck Inst. and Aachen, Tech. Hochsch.), Gudrun Heinrich (KIT, Karlsruhe, TP), Stephen P. Jones (CERN and Durham U., IPPP), Matthias Kerner (Zurich U.), Jonas Klappert (RWTH Aachen U.) et al. (Nov 24, 2020)

Published in: *JHEP* 03 (2021) 125 • e-Print: 2011.12325 [hep-ph]

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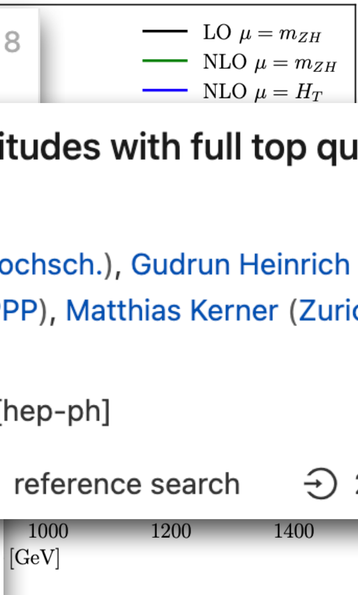

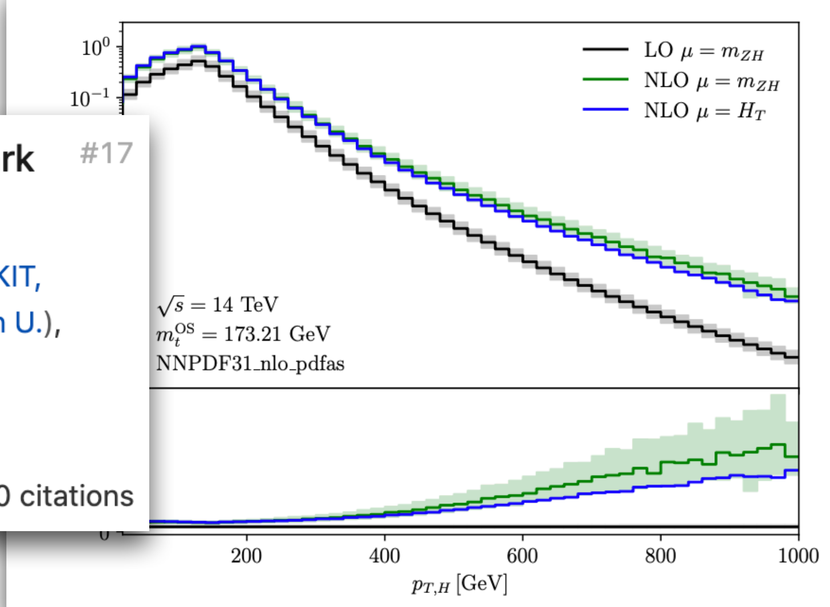

the high-energy expansions

Luigi Bellafronte (Santiago de Compos... Rome3), Pier Paolo Giardino (Santiago... Dept. Phys. Astron. and INFN, Padua),

Published in: *JHEP* 07 (2022) 069 • e-Print: 2202.12157 [hep-ph]

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Published in: *JHEP* 08 (2022) 009 • e-Print: 2205.02769 [hep-ph]

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Guoxing Wang (Zhejiang U., Inst. Mod. Phys.), Xiaofeng Xu (Bern U.), Yongqi Xu (Peking U. and Peking U., SKLNPT), Li Lin Yang (Zhejiang U., Inst. Mod. Phys.) (Jul 17, 2021)

Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

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Published in: *JHEP* 03 (2021) 125 • e-Print: 2011.12325 [hep-ph]

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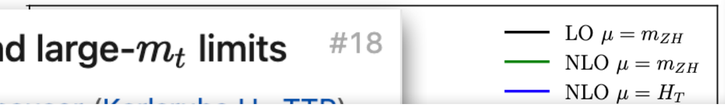

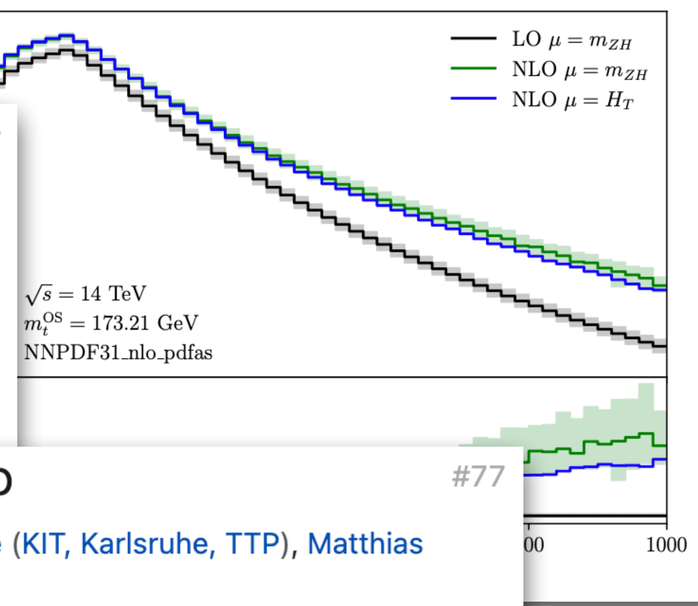

the high-energy expansions

Luigi Bellafronte (Santiago de Compos... Rome3), Pier Paolo Giardino (Santiago... Dept. Phys. Astron. and INFN, Padua),

Published in: *JHEP* 07 (2022) 069 • e-Print: 2202.12157 [hep-ph]

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On top quark mass effects to $gg \to ZH$ at NLO #77

Alexander Hasselhuhn (KIT, Karlsruhe, TTP), Thomas Luthe (KIT, Karlsruhe, TTP), Matthias Steinhauser (Karlsruhe U., TTP) (Nov 17, 2016)

Published in: *JHEP* 01 (2017) 073 • e-Print: 1611.05881 [hep-ph]

Giuseppe Degrassi (CERN and Rome III U. and INFN, Rome3), Ramona Gröbe... INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3), Xiaoran Zhao (Rome III U. and INFN, Rome3) (May 5, 2022)

Published in: *JHEP* 08 (2022) 009 • e-Print: 2205.02769 [hep-ph]

pdf DOI cite claim reference search 4 citations

...and Shandong U.), Joshua Davies (Sussex U.), Gudrun ...hen P. Jones (Durham U., IPPP), Matthias Kerner (KIT, Karlsruhe ...(Apr 11, 2022)

...6 • e-Print: 2204.05225 [hep-ph]

claim reference search 7 citations

dependence

Guoxing Wang (Zhejiang U., Inst. Mod. Phys.), Xiaofeng Xu (Bern U.), Yongqi Xu (Peking U. and Peking U., SKLNPT), Li Lin Yang (Zhejiang U., Inst. Mod. Phys.) (Jul 17, 2021)

Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

pdf DOI cite claim reference search 11 citations

Virtual corrections to $gg \to ZH$ in the high-energy and large-m_t limits #18

Joshua Davies (Sussex U.), Go Mis... (Nov 24, 2020)

Published in: *JHEP* 03 (2021) 034

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ZH production in gluon fusion: two-loop amplitudes with full top quark mass dependence #17

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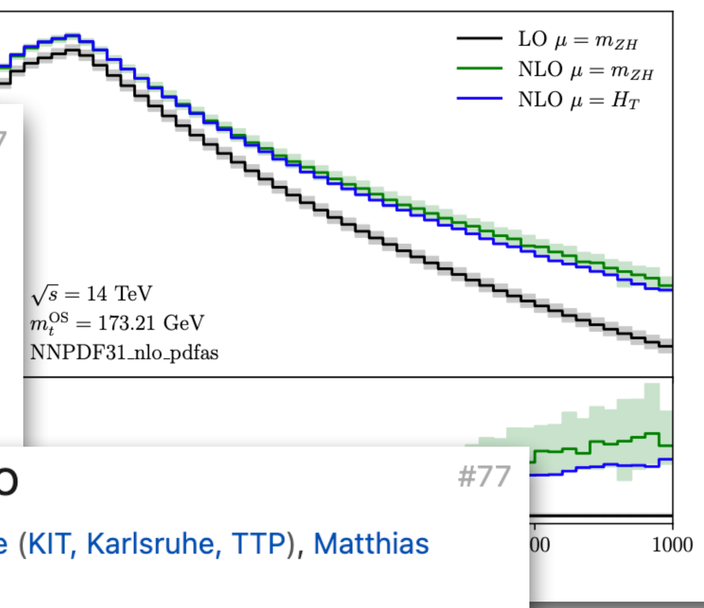
Published in: *JHEP* 03 (2021) 125 • e-Print: 2011.12325 [hep-ph]

pdf DOI cite



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Luigi Bellafronte (Santiago de Compos... Rome3), Pier Paolo Giardino (Santiago... Dept. Phys. Astron. and INFN, Padua),...

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Published in: *JHEP* 08 (2022) 009 • e-Print: 2205.02769 [hep-ph]

pdf DOI cite claim reference search

...and Shandong U.), Joshua Davies (Sussex U.), Gudrun ...hen P. Jones (Durham U., IPPP), Matthias Kerner (KIT, Karlsruhe ...(Apr 11, 2022)

...dependence

Guoxing Wang (Zhejiang U., Inst. Mod. Phys.), Xiaofeng Xu (Bern U.), Yongqi Xu (P... Peking U., SKLNPT), Li Lin Yang (Zhejiang U., Inst. Mod. Phys.) (Jul 17, 2021)

Published in: *Phys.Lett.B* 829 (2022) 137087 • e-Print: 2107.08206 [hep-ph]

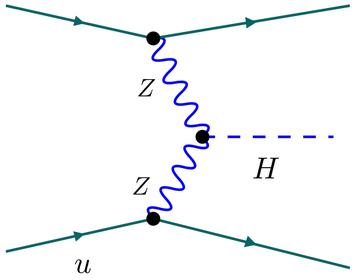
pdf DOI cite claim reference search

Virtual corrections to $gg \to ZH$ via a transverse momentum expansion #14

Lina Alasfar (Humboldt U., Berlin), Giuseppe Degrassi (Rome III U. and INFN, Rome3), Pier Paolo Giardino (Santiago de Compostela U., IGFAE), Ramona Gröber (U. Padua, Dept. Phys. Astron. and INFN, Padua), Marco Vitti (Rome III U. and INFN, Rome3) (Mar 10, 2021)

Published in: *JHEP* 05 (2021) 168 • e-Print: 2103.06225 [hep-ph]

pdf DOI cite claim reference search 15 citations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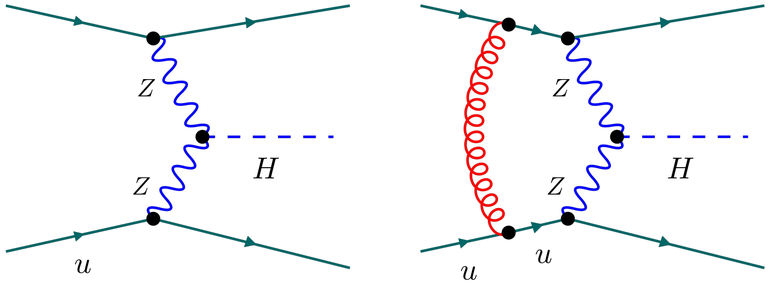

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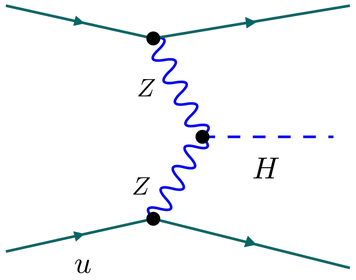

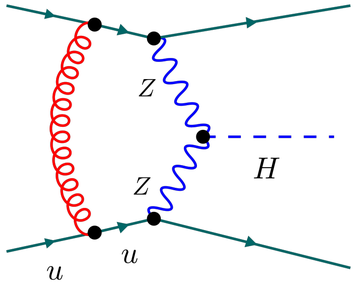

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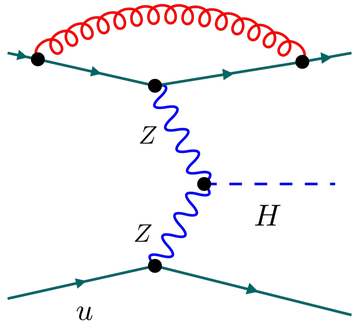

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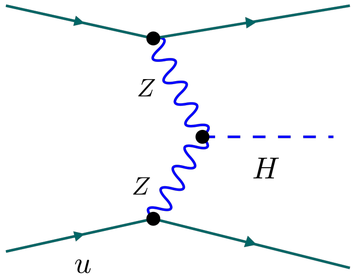

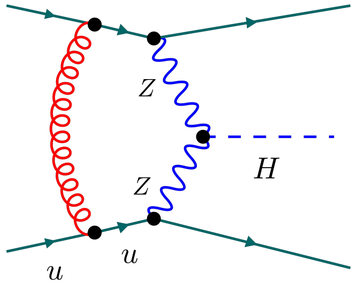

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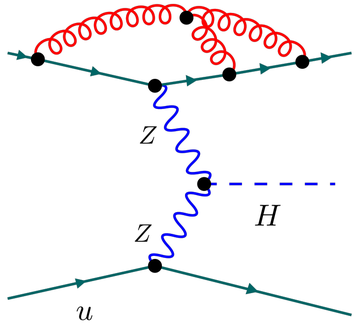

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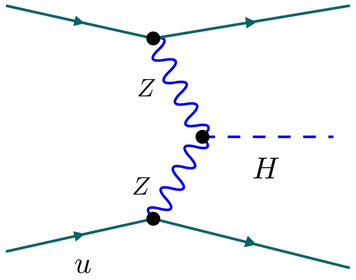

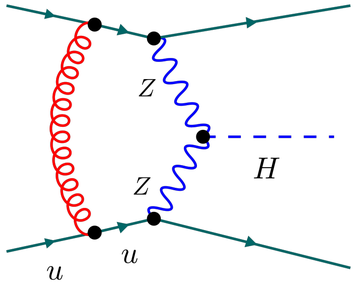

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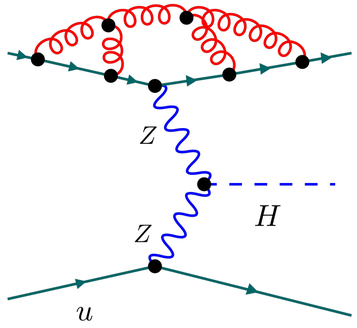


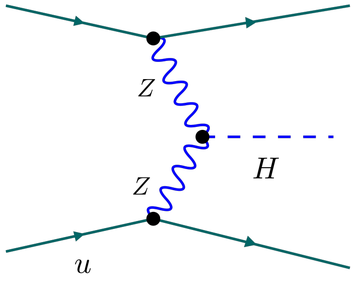
DIS

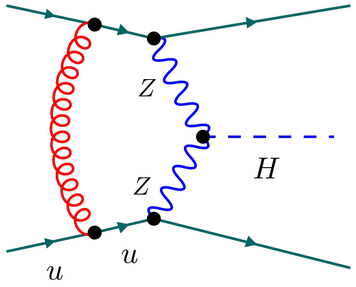
Vector-Boson Fusion Higgs Production at Three Loops in QCD #8

Frédéric A. Dreyer (UPMC, Paris (main) and Paris, LPTHE and CERN), Alexander Karlberg (Oxford U., Theor. Phys.) (Jun 2, 2016)

Published in: *Phys.Rev.Lett.* 117 (2016) 7, 072001 • e-Print: 1606.00840 [hep-ph]

pdf DOI cite claim reference search 141 citations





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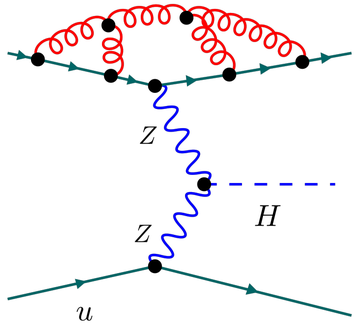

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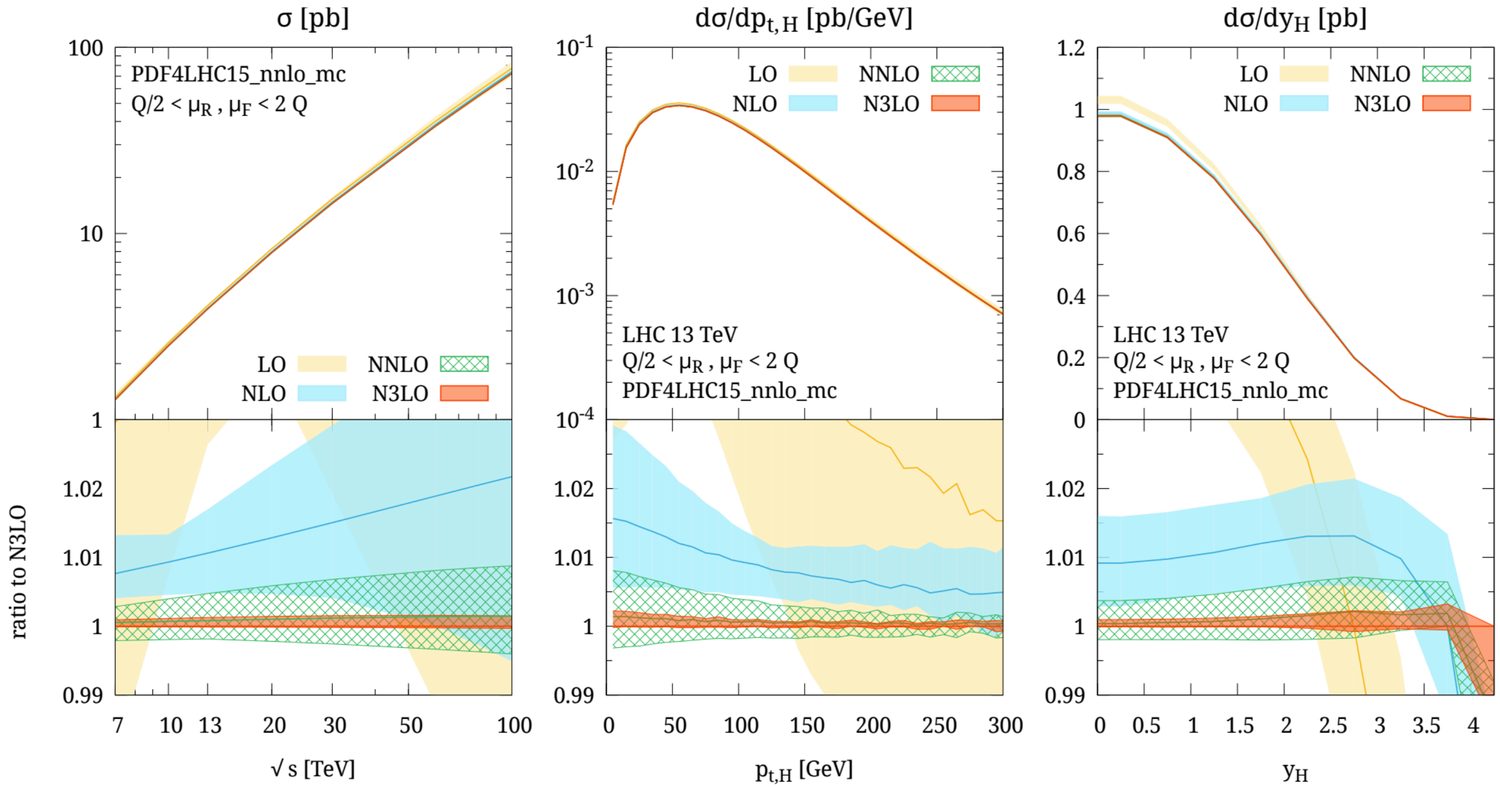

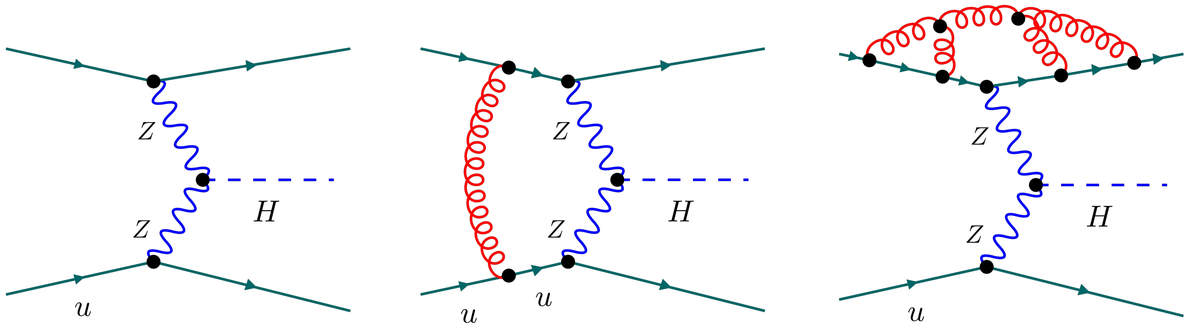
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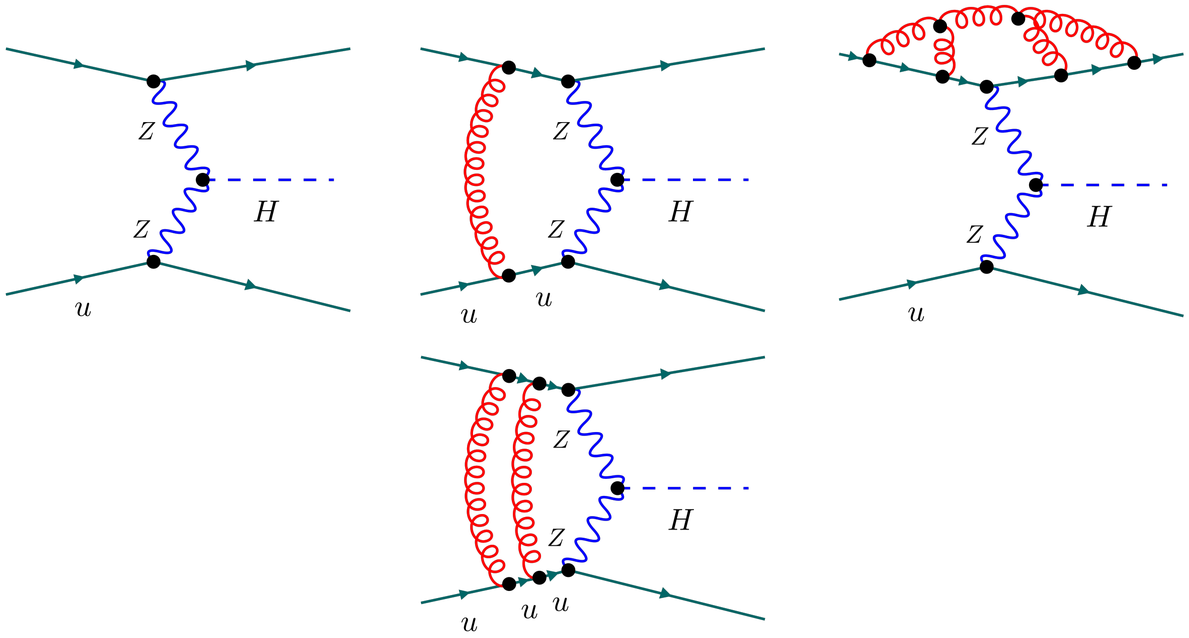
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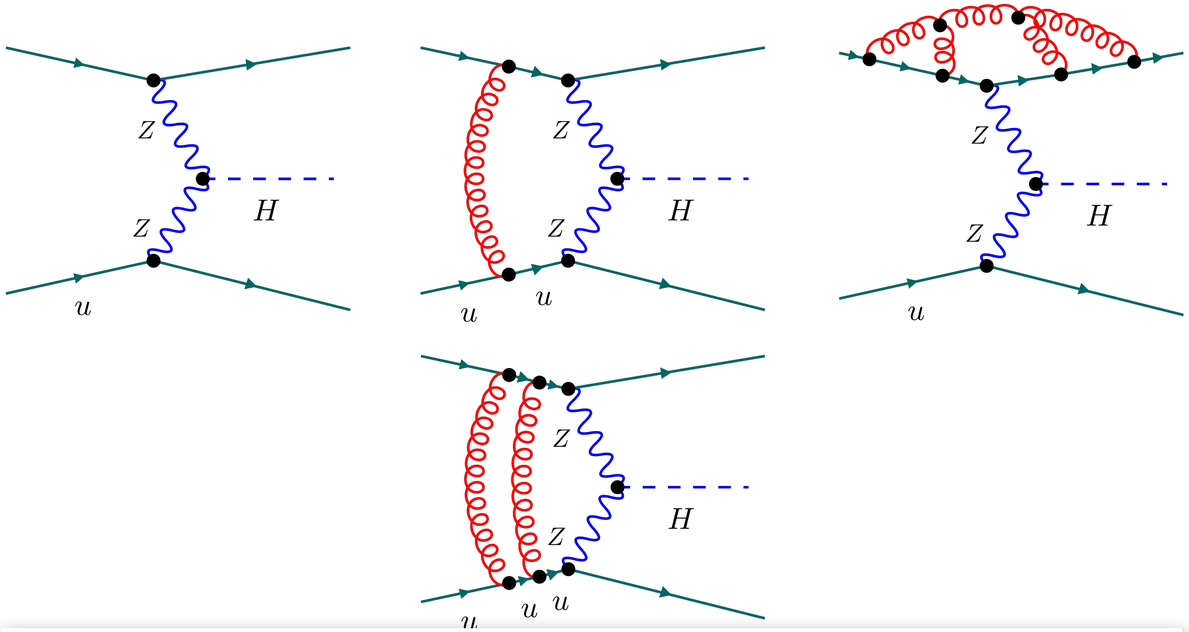
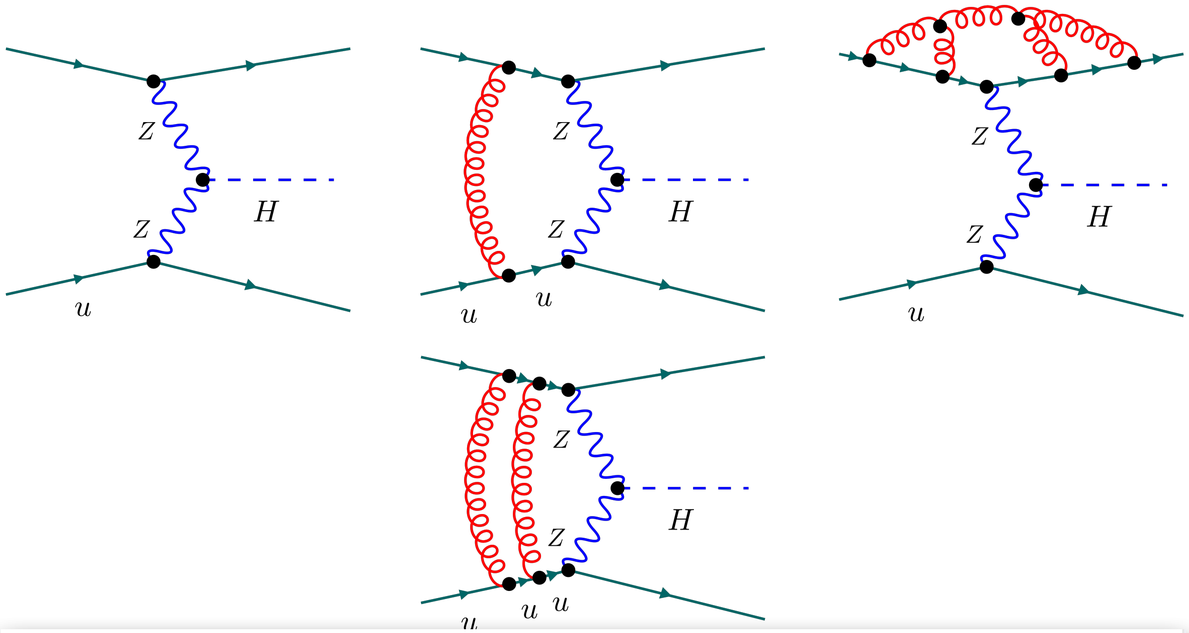


Nonfactorizable QCD Effects in Higgs Boson Production via Vector Boson Fusion #1

Tao Liu (Alberta U.), Kirill Melnikov (KIT, Karlsruhe, TTP), Alexander A. Penin (Alberta U. and KIT, Karlsruhe, TTP and Zurich, ETH) (Jun 26, 2019)

Published in: *Phys.Rev.Lett.* 123 (2019) 12, 122002 • e-Print: 1906.10899 [hep-ph]

pdf DOI cite claim reference search 31 citations



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Published in: *Phys.Rev.Lett.* 123 (2019) 12, 122002 • e-Print: 1906.10899 [hep-ph]

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On the impact of non-factorisable corrections in VBF single and double Higgs production #3

Frédéric A. Dreyer (Oxford U., Theor. Phys.), Alexander Karlberg (Oxford U., Theor. Phys.), Lorenzo Tancredi (Oxford U., Theor. Phys.) (May 22, 2020)

Published in: *JHEP* 10 (2020) 131 • e-Print: 2005.11334 [hep-ph]

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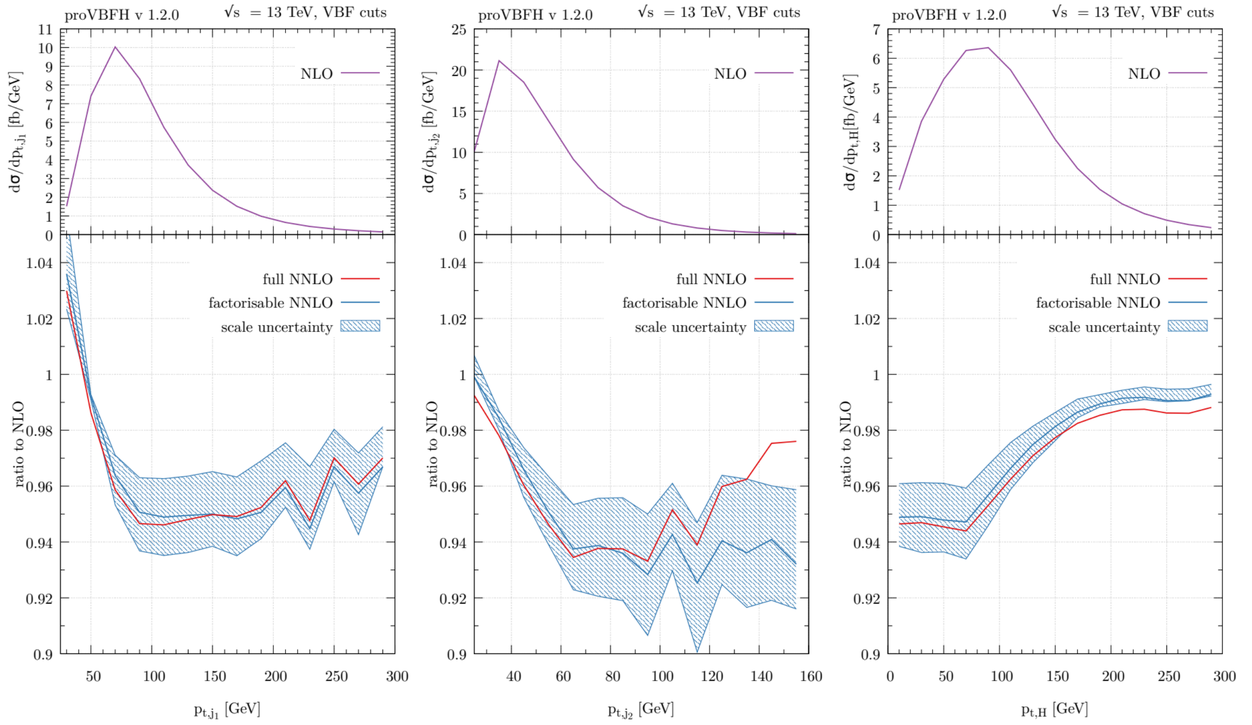

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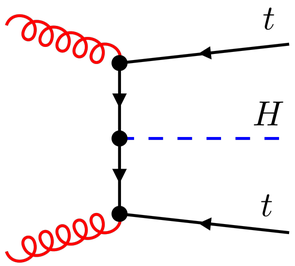
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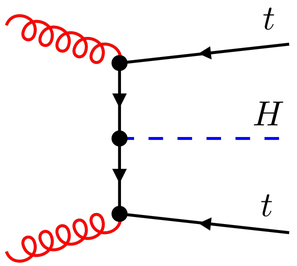

The simplest of them all: $t\bar{t}W^{\pm}$ at NLO accuracy in QCD #29

Giuseppe Bevilacqua (MTA-DE, Debrecen), Huan-Yu Bi (RWTH Aachen U.), Heribertus Bayu Hartanto (Durham U., IPPP), Manfred Kraus (Florida State U.), Malgorzata Worek (RWTH Aachen U.) (May 19, 2020)

Published in: *JHEP* 08 (2020) 043 • e-Print: 2005.09427 [hep-ph]

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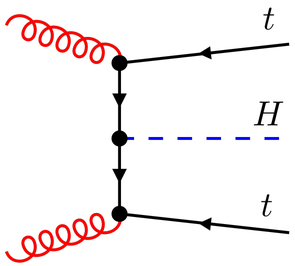

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Published in: *JHEP* 08 (2020) 043 • e-Print: 2005.09427 [hep-ph]

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NLO QCD corrections to full off-shell production of $t\bar{t}Z$ including leptonic decays #4

Giuseppe Bevilacqua (MTA-DE, Debrecen and Debrecen U.), Heribertus Bayu Hartanto (Cambridge U.), Manfred Kraus (Florida State U.), Jasmina Nasufi (RWTH Aachen U.), Malgorzata Worek (RWTH Aachen U.) (Mar 29, 2022)

Published in: *JHEP* 08 (2022) 060 • e-Print: 2203.15688 [hep-ph]

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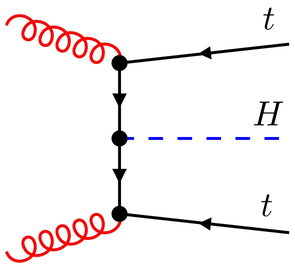

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Higgs production in association with off-shell top-antitop pairs at NLO EW and QCD at the LHC #18

Ansgar Denner (Wurzburg U.), Jean-Nicolas Lang (Wurzburg U.), Mathieu Pellen (Wurzburg U.), Sandro Uccirati (INFN, Turin and Turin U.) (Dec 21, 2016)

Published in: *JHEP* 02 (2017) 053 • e-Print: 1612.07138 [hep-ph]

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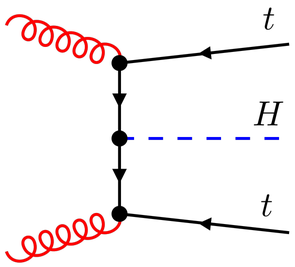

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$t\bar{t}b\bar{b}$ at the LHC: On the size of off-shell effects and prompt b-jet identification #5

Giuseppe Bevilacqua (MTA-DE, Debrecen and Debrecen U.), Huan-Yu Bi (RWTH Aachen U.), Heribertus Bayu Hartanto (Cambridge U.), Manfred Kraus (Florida State U.), Michele Lupattelli (RWTH Aachen U.) et al. (Feb 22, 2022)

e-Print: 2202.11186 [hep-ph]

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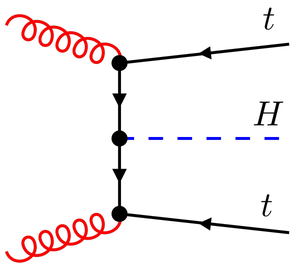

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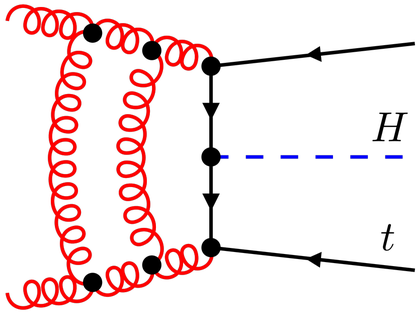

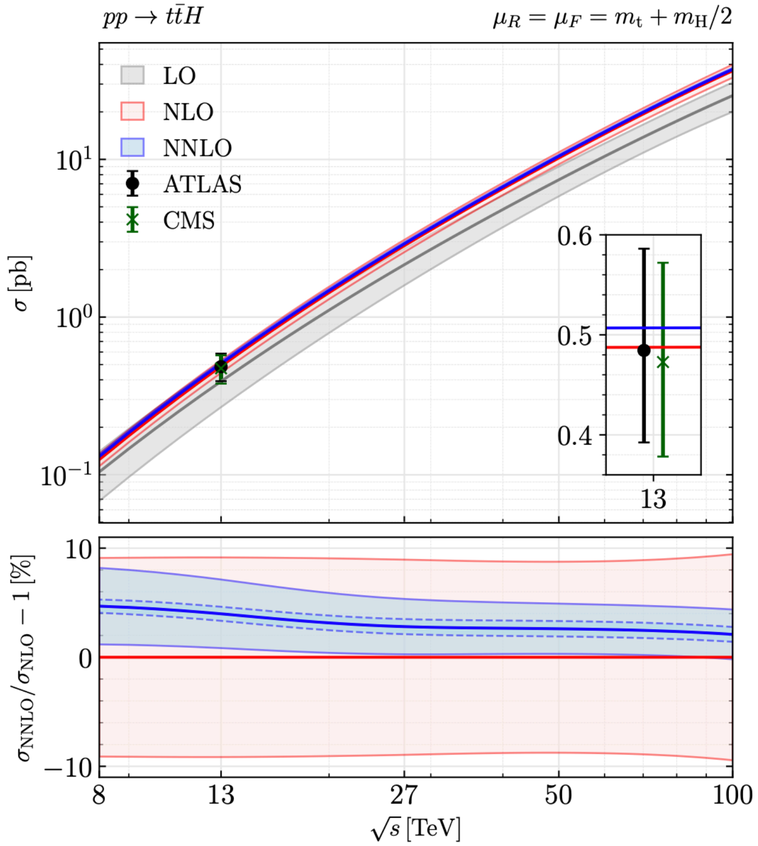

$t\bar{t}H$ production in NNLO QCD

#1

Stefano Catani (INFN, Florence and Florence U.), Simone Devoto (INFN, Milan and Milan U.), Massimiliano Grazzini (Zurich U.), Stefan Kallweit (INFN, Milan Bicocca and Milan Bicocca U.), Javier Mazzitelli (Munich, Max Planck Inst. and PSI, Villigen) et al. (Oct 14, 2022)

e-Print: 2210.07846 [hep-ph]

What I could not talk about …. Parton shower effects

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What I could not talk about …. Parton shower effects

Parton-shower effects in Higgs production via Vector-Boson Fusion #25

Barbara Jäger (Tubingen U.), Alexander Karlberg (Oxford U., Theor. Phys.), Simon Plätzer (Vienna U.), Johannes Scheller (Tubingen U.), Marco Zaro (INFN, Milan) (Mar 27, 2020)

Published in: *Eur.Phys.J.C* 80 (2020) 8, 756 • e-Print: 2003.12435 [hep-ph]

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Published in: *Eur.Phys.J.C* 80 (2020) 8, 756 • e-Print: 2003.12435 [hep-ph]

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NLO QCD+EW predictions for HV and HV +jet production including parton-shower effects #63

Federico Granata (Milan Bicocca U. and INFN, Milan Bicocca), Jonas M. Lindert (Durham U. and Durham U., IPPP), Carlo Oleari (INFN, Milan Bicocca and Milan Bicocca U.), Stefano Pozzorini (Zurich U.) (Jun 12, 2017)

Published in: *JHEP* 09 (2017) 012 • e-Print: 1706.03522 [hep-ph]

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Published in: *Eur.Phys.J.C* 80 (2020) 8, 756 • e-Print: 2003.12435 [hep-ph]

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Next-to-next-to-leading order event generation for VH production with H →$b\bar{b}$ decay #9

Silvia Zanoli (Munich, Max Planck Inst.), Mauro Chiesa (Pavia U.), Emanuele Re (INFN, Milan Bicocca and Annecy, LAPTH), Marius Wiesemann (Munich, Max Planck Inst.), Giulia Zanderighi (Munich, Max Planck Inst. and Munich, Tech. U.) (Dec 8, 2021)

Published in: *JHEP* 07 (2022) 008 • e-Print: 2112.04168 [hep-ph]

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NNLOPS accurate associated HZ production with $H \to b\bar{b}$ decay at NLO #48

William Astill (Oxford U., Theor. Phys.), Wojciech Bizoń (Oxford U., Theor. Phys.), Emanuele Re (Annecy, LAPTH and CERN), Giulia Zanderighi (CERN and Oxford U., Theor. Phys.) (Apr 22, 2018)

Published in: *JHEP* 11 (2018) 157 • e-Print: 1804.08141 [hep-ph]

What I could not talk about …. Parton shower effects

Parton-shower effects in Higgs production via Vector-Boson Fusion #25

Barbara Jäger (Tubingen U.), Alexander Karlberg (Oxford U., Theor. Phys.), Simon Plätzer (Vienna U.), Johannes Scheller (Tubingen U.), Marco Zaro (INFN, Milan) (Mar 27, 2020)

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Published in: *J*

Higgsstrahlung at NNLL′+NNLO matched to parton showers in GENEVA #35

Simone Alioli (INFN, Milan Bicocca and Milan Bicocca U.), Alessandro Broggio (INFN, Milan Bicocca and Milan Bicocca U.), Stefan Kallweit (INFN, Milan Bicocca and Milan Bicocca U.), Matthew A. Lim (INFN, Milan Bicocca and Milan Bicocca U.), Luca Rottoli (INFN, Milan Bicocca and Milan Bicocca U.) (Sep 4, 2019)

Published in: *Phys.Rev.D* 100 (2019) 9, 096016 • e-Print: 1909.02026 [hep-ph]

What I could not talk about…

- HH
- off-shell Higgs production
- Higgs decays
- resummation
- EFT
- BSM
- …

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Report from Working Group 2 : Higgs Physics at the HL-LHC and HE-LHC #1

M. Cepeda (CERN and Madrid, CIEMAT), S. Gori (UC, Santa Cruz, Inst. Part. Phys.), P. Ilten (Birmingham U.), M. Kado (Orsay, LAL and INFN, Rome and Rome U.), F. Riva (Geneva U., Dept. Theor. Phys.) et al. (Jan 31, 2019)

Published in: *CERN Yellow Rep.Monogr.* 7 (2019) 221-584 • Proceedings of: HL/HE-LHC Workshop, 221-584 • e-Print: 1902.00134 [hep-ph]

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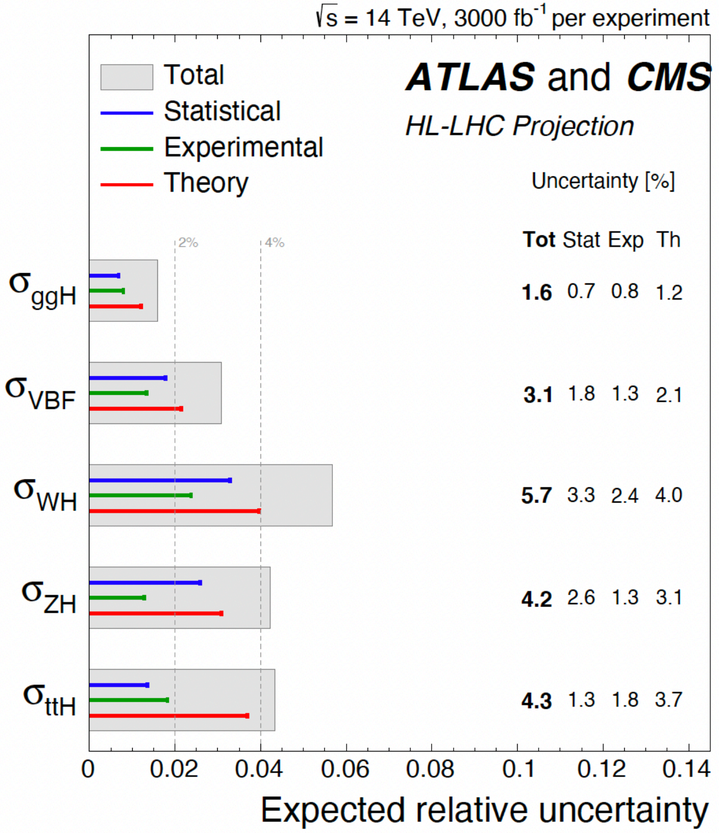

Conclusions

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- Precision Higgs physics could be the key to BTeV region
- enormous theoretical progress since YR4
- NNLO standard, N^{3}LO in full swing
- progress in all production modes
- take into account in analyses, and acknowledge!

Report from Working Group 2 : Higgs Physics at the HL-LHC and HE-LHC #1

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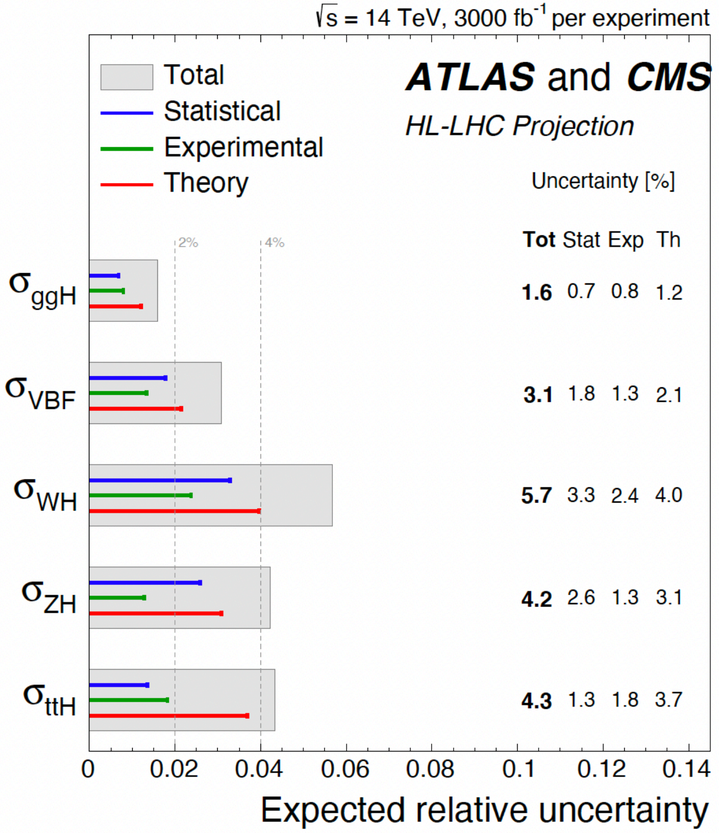


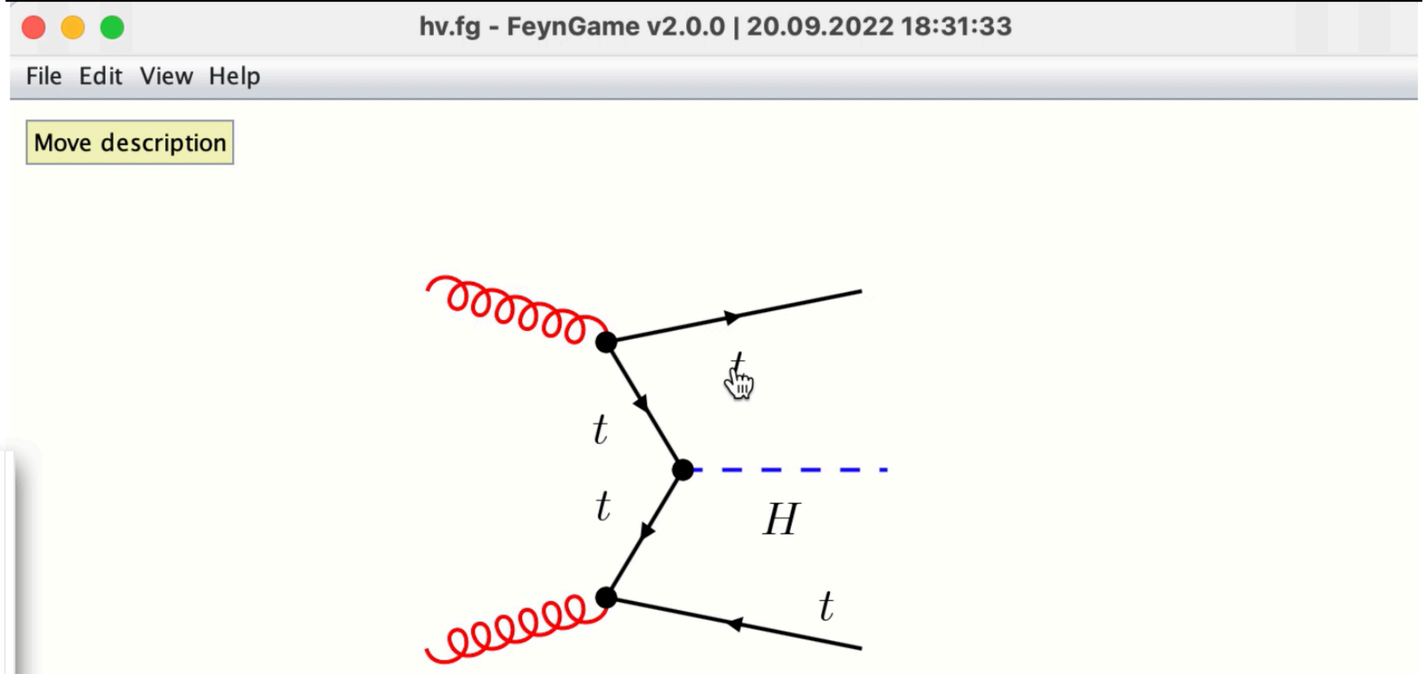
FeynGame #1

R.V. Harlander (Aachen, Tech. Hochsch.), S.Y. Klein (Aachen, Tech. Hochsch.), M. Lipp (Aachen, Tech. Hochsch.) (Feb 28, 2020)

Published in: *Comput.Phys.Commun.* 256 (2020) 107465 • e-Print: 2003.00896 [physics.ed-ph]

pdf DOI cite claim reference search 16 citations

see https://web.physik.rwth-aachen.de/user/harlander/software/feyngame/



see the movie here