Erratum: Observing $H \rightarrow W^{(*)}W^{(*)} \rightarrow e^{\pm}\mu^{\mp}\not{p}_T$ in weak boson fusion with the dual forward jet tagging at the CERN LHC
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A typographical error in the implementation of the lepton separation cut for the $t\bar{t}$+jets backgrounds led to an underestimate of $t\bar{t}$ backgrounds at advanced levels of cuts. This results in changes in the tables and a slight increase of the background level in Fig. 4. The corrected Table I is listed below.

As a result, the final background estimate increases to 8.1 events for 5 fb^{-1} of data. The new background level only affects Fig. 4, which shows the Higgs boson transverse mass distribution, $d\sigma/dM_{T_{WW}}$, for the background and three choices of Higgs masses, 130, 160, and 190 GeV.

The loss in signal significance due to the larger $t\bar{t}$+jets background can easily be compensated for by imposing a mass dependent $M_{T_{WW}}$ cut, as given in the first line of Table II. This new cut is extremely effective at removing a large fraction of the background while, on average, losing about 1 signal event per 5 fb^{-1} of data. We show the new final estimates in Table II. The final conclusions remain unchanged: we expect a clean, 5σ observation of a SM Higgs boson signal to be possible with only 5 fb^{-1} of data over the range 140 GeV$<m_H<$200 GeV.
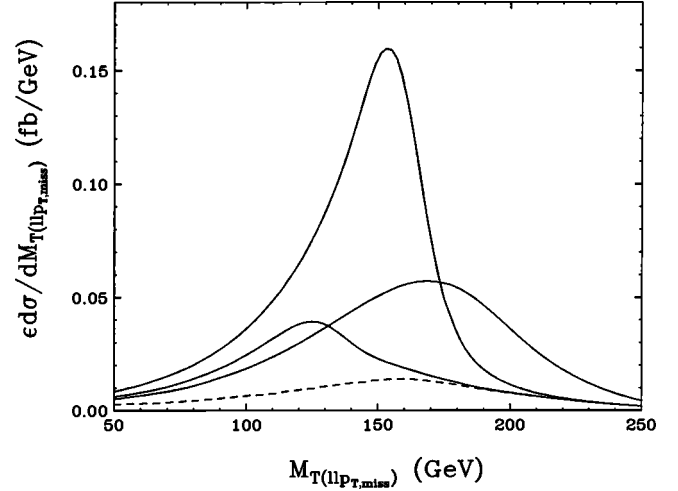

FIG. 4. Dilepton-$\not{p}_T$ transverse mass distributions expected for a Higgs boson of mass $m_H = 130$, 160, and 190 GeV (solid) after the cuts of Eqs. (10)–(16) and application of all detector efficiencies and a minijet veto with $p_{T,\text{veto}} = 20$ GeV. Also shown is the background only (dashed).

TABLE I. Signal rates, $\sigma \cdot B(H \rightarrow e^{\pm}\mu^{\mp}\not{p}_T)$, for $m_H = 160$ GeV and corresponding background cross sections, in pp collisions at $\sqrt{s} = 14$ TeV. Rates are at various levels of cuts and are given in fb. See text for details.

Cuts	Hjj	$t\bar{t}$+jets	QCD $WWjj$	EW $WWjj$	QCD $\tau\tau jj$	EW $\tau\tau jj$	S/B
Forward tagging (10)–(12)	17.1	1080	4.4	3.0	15.8	0.8	$\approx 1/65$
+b veto (13)		64					1/5.1
+M_{jj}, angular cuts (14)–(16)	11.8	5.5	0.54	0.50	3.6	0.4	1.1/1
+real τ rejection (17)	11.4	5.1	0.50	0.45	0.6	0.08	1.7/1
$P_{\text{surv},20}$	$\times 0.89$	$\times 0.29$	$\times 0.29$	$\times 0.75$	$\times 0.29$	$\times 0.75$	–
+minijet veto (18)	10.1	1.48	0.15	0.34	0.18	0.07	4.6/1
+tag ID efficiency ($\times 0.74$)	7.5	1.09	0.11	0.25	0.13	0.05	4.6/1

TABLE II. Number of expected events for the Hjj signal, for 5 fb^{-1} integrated luminosity and application of all efficiency factors and cuts, including a minijet veto and an additional upper $M_{T_{WW}}$ cut, for a range of Higgs boson masses. The number of both signal and background events are shown, as well as S/B. The Poisson probability of the background to fluctuate up to the signal level is given in terms of σ_{Gauss}, the number of Gaussian equivalent standard deviations.

m_H (GeV)	115	120	130	140	150	160	170	180	190	200
M_T cutoff (GeV)	135	140	150	160	170	180	210	220	none	none
No. S events	1.9	3.4	8.3	14.8	22.7	36.5	35.9	29.3	20.8	16.3
No. B events	3.0	3.4	4.0	4.7	5.4	6.0	7.2	7.5	8.1	8.1
S/B	0.6	1.0	2.0	3.1	4.2	6.1	5.0	3.9	2.6	2.0
σ_{Gauss}	0.8	1.4	3.1	5.0	6.8	9.6	9.0	7.6	5.5	4.5