CMS VVV Yield Tables
EFT Analysis

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1 Limits Summary Table

Wilson Coefficient	Limit @ 95% CL
cW	[−0.103, 0.100]
cHq3	[−0.209, 0.175]
cHq1	[−0.281, 0.277]
cHu	[−0.525, 0.516]
cHd	[−0.654, 0.659]
cHW	[−1.239, 1.168]
cHB	[−1.239, 1.243]
cHWB	[−3.967, 3.787]
cHl3	[−2.870, 13.870]
cll1	[−27.700, 5.700]
cHbox	[−55.000, 49.000]
cHDD	[−93.000, 56.000]

Table 1: Limit summaries for dim-6 Wilson coefficients fit in independent 1-dimensional scans.

2 Background Tables

2.1 0Lepton2FJ

Bin [GeV]	DY	QCD	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	328.32 ± 4.74	10361.77 ± 84.30	334.98 ± 6.51	1318.15 ± 11.45	372.89 ± 9.07	60.48 ± 3.03	22.70 ± 2.91	85.75 ± 4.69	26.50 ± 0.00	12911.6 ± 86.2
$1100 - 2500$	323.83 ± 4.71	10326.95 ± 84.25	332.79 ± 6.49	1305.71 ± 11.39	364.86 ± 9.00	60.13 ± 3.02	22.25 ± 2.88	84.02 ± 4.64	25.79 ± 0.00	12846.3 ± 86.1
$2500 - 4000$	4.49 ± 0.55	34.58 ± 3.14	2.19 ± 0.50	12.36 ± 1.13	7.66 ± 1.10	0.36 ± 0.22	0.26 ± 0.37	1.73 ± 0.69	0.71 ± 0.00	64.3 ± 3.7
$4000-$	0.00 ± 0.00	0.25 ± 0.11	0.00 ± 0.00	0.07 ± 0.07	0.38 ± 0.19	0.00 ± 0.00	0.19 ± 0.19	0.00 ± 0.00	0.01 ± 0.00	0.9 ± 0.3

Table 2: Yields per bin for SR 0Lepton2FJ. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	DY	QCD	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	$328.32^{+0.00}_{-0.00}$	$10361.77^{+0.00}_{-0.00}$	$334.98^{+0.00}_{-0.00}$	$1318.15^{+0.00}_{-0.00}$	$372.89^{+0.00}_{-0.00}$	$60.48^{+0.00}_{-0.00}$	$22.70^{+0.00}_{-0.00}$	$85.75^{+0.00}_{-0.00}$	$26.50^{+0.00}_{-0.00}$	$12911.6^{+0.0}_{-0.0}$
$1100 - 2500$	$323.83^{+0.00}_{-0.00}$	$10326.95^{+0.00}_{-0.00}$	$332.79^{+0.00}_{-0.00}$	$1305.71^{+0.00}_{-0.00}$	$364.86^{+0.00}_{-0.00}$	$60.13^{+0.00}_{-0.00}$	$22.25^{+0.00}_{-0.00}$	$84.02^{+0.00}_{-0.00}$	$25.79^{+0.00}_{-0.00}$	$12846.3^{+0.0}_{-0.0}$
$2500 - 4000$	$4.49^{+0.00}_{-0.00}$	$34.58^{+0.00}_{-0.00}$	$2.19^{+0.00}_{-0.00}$	$12.36^{+0.00}_{-0.00}$	$7.66^{+0.00}_{-0.00}$	$0.36^{+0.00}_{-0.00}$	$0.26^{+0.00}_{-0.00}$	$1.73^{+0.00}_{-0.00}$	$0.71^{+0.00}_{-0.00}$	$64.3^{+0.0}_{-0.0}$
$4000-$	$0.00^{+0.00}_{-0.00}$	$0.25^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$0.07^{+0.00}_{-0.00}$	$0.38^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$0.19^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$0.01^{+0.00}_{-0.00}$	$0.9^{+0.0}_{-0.0}$

Table 3: Yields per bin for SR 0Lepton2FJ. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.2 0Lepton3FJ

Bin [GeV]	DY	QCD	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	14.03 ± 0.96	353.83 ± 12.04	88.76 ± 3.16	33.17 ± 1.76	8.55 ± 1.22	0.82 ± 0.35	1.52 ± 0.47	65.28 ± 3.93	4.87 ± 0.00	570.8 ± 13.3
$1250 - 1500$	8.32 ± 0.74	246.47 ± 10.54	63.43 ± 2.67	19.30 ± 1.34	4.26 ± 0.91	0.19 ± 0.11	0.65 ± 0.30	38.09 ± 3.01	2.52 ± 0.00	383.2 ± 11.4
$1500 - 1750$	3.35 ± 0.48	75.06 ± 5.25	16.53 ± 1.38	8.49 ± 0.90	2.66 ± 0.64	0.07 ± 0.07	0.19 ± 0.19	15.81 ± 1.92	1.12 ± 0.00	123.3 ± 5.9
$1750 - 2000$	1.31 ± 0.30	22.67 ± 1.88	5.67 ± 0.80	3.11 ± 0.54	0.99 ± 0.36	0.00 ± 0.00	0.55 ± 0.28	6.02 ± 1.19	0.53 ± 0.00	40.8 ± 2.5
$2000 - 2250$	0.76 ± 0.22	6.79 ± 1.29	2.08 ± 0.45	0.92 ± 0.30	0.23 ± 0.26	0.21 ± 0.21	0.00 ± 0.00	2.96 ± 0.84	0.36 ± 0.00	14.3 ± 1.7
$2250 - 2500$	0.16 ± 0.11	2.02 ± 0.88	0.61 ± 0.25	0.69 ± 0.24	0.13 ± 0.13	0.15 ± 0.15	0.13 ± 0.13	0.67 ± 0.40	0.16 ± 0.00	4.7 ± 1.1
$2500-$	0.14 ± 0.10	0.84 ± 0.54	0.43 ± 0.23	0.67 ± 0.26	0.29 ± 0.17	0.21 ± 0.21	0.00 ± 0.00	1.74 ± 0.67	0.18 ± 0.00	4.5 ± 1.0

Table 4: Yields per bin for SR 0Lepton3FJ. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	DY	QCD	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	$14.03^{+0.00}_{-0.00}$	$353.83^{+0.00}_{-0.00}$	$88.76^{+0.00}_{-0.00}$	$33.17^{+0.00}_{-0.00}$	$8.55^{+0.00}_{-0.00}$	$0.82^{+0.00}_{-0.00}$	$1.52^{+0.00}_{-0.00}$	$65.28^{+0.00}_{-0.00}$	$4.87^{+0.00}_{-0.00}$	$570.8^{+0.0}_{-0.0}$
$1250 - 1500$	$8.32^{+0.00}_{-0.00}$	$246.47^{+0.00}_{-0.00}$	$63.43^{+0.00}_{-0.00}$	$19.30^{+0.00}_{-0.00}$	$4.26^{+0.00}_{-0.00}$	$0.19^{+0.00}_{-0.00}$	$0.65^{+0.00}_{-0.00}$	$38.09^{+0.00}_{-0.00}$	$2.52^{+0.00}_{-0.00}$	$383.2^{+0.0}_{-0.0}$
$1500 - 1750$	$3.35^{+0.00}_{-0.00}$	$75.06^{+0.00}_{-0.00}$	$16.53^{+0.00}_{-0.00}$	$8.49^{+0.00}_{-0.00}$	$2.66^{+0.00}_{-0.00}$	$0.07^{+0.00}_{-0.00}$	$0.19^{+0.00}_{-0.00}$	$15.81^{+0.00}_{-0.00}$	$1.12^{+0.00}_{-0.00}$	$123.3^{+0.0}_{-0.0}$
$1750 - 2000$	$1.31^{+0.00}_{-0.00}$	$22.67^{+0.00}_{-0.00}$	$5.67^{+0.00}_{-0.00}$	$3.11^{+0.00}_{-0.00}$	$0.99^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$0.55^{+0.00}_{-0.00}$	$6.02^{+0.00}_{-0.00}$	$0.53^{+0.00}_{-0.00}$	$40.8^{+0.0}_{-0.0}$
$2000 - 2250$	$0.76^{+0.00}_{-0.00}$	$6.79^{+0.00}_{-0.00}$	$2.08^{+0.00}_{-0.00}$	$0.92^{+0.00}_{-0.00}$	$0.23^{+0.00}_{-0.00}$	$0.21^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$2.96^{+0.00}_{-0.00}$	$0.36^{+0.00}_{-0.00}$	$14.3^{+0.0}_{-0.0}$
$2250 - 2500$	$0.16^{+0.00}_{-0.00}$	$2.02^{+0.00}_{-0.00}$	$0.61^{+0.00}_{-0.00}$	$0.69^{+0.00}_{-0.00}$	$0.13^{+0.00}_{-0.00}$	$0.15^{+0.00}_{-0.00}$	$0.13^{+0.00}_{-0.00}$	$0.67^{+0.00}_{-0.00}$	$0.16^{+0.00}_{-0.00}$	$4.7^{+0.0}_{-0.0}$
$2500-$	$0.14^{+0.00}_{-0.00}$	$0.84^{+0.00}_{-0.00}$	$0.43^{+0.00}_{-0.00}$	$0.67^{+0.00}_{-0.00}$	$0.29^{+0.00}_{-0.00}$	$0.21^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$1.74^{+0.00}_{-0.00}$	$0.18^{+0.00}_{-0.00}$	$4.5^{+0.0}_{-0.0}$

Table 5: Yields per bin for SR 0Lepton3FJ. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.3 1Lepton

Bin [GeV]	Other	Top	WJets	SMVVV	Bkg
Inclusive	158.59 ± 0.00	313.88 ± 0.00	555.28 ± 0.00	20.19 ± 0.00	1047.9 ± 0.0
$500 - 1600$	129.56 ± 0.00	268.07 ± 0.00	410.08 ± 0.00	14.67 ± 0.00	822.4 ± 0.0
$1600 - 2600$	27.45 ± 0.00	43.22 ± 0.00	128.50 ± 0.00	4.74 ± 0.00	203.9 ± 0.0
$2600 - 3400$	1.47 ± 0.00	2.50 ± 0.00	15.23 ± 0.00	0.65 ± 0.00	19.8 ± 0.0
$3400-$	0.10 ± 0.00	0.08 ± 0.00	1.47 ± 0.00	0.12 ± 0.00	1.8 ± 0.0

Table 6: Yields per bin for SR 1Lepton. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	Other	Top	WJets	SMVVV	Bkg
Inclusive	$158.59^{+0.00}_{-0.00}$	$313.88^{+0.00}_{-0.00}$	$555.28^{+6.42}_{-7.48}$	$20.19^{+0.00}_{-0.00}$	$1047.9^{+6.4}_{-7.5}$
$500 - 1600$	$129.56^{+0.00}_{-0.00}$	$268.07^{+0.00}_{-0.00}$	$410.08^{+4.30}_{-4.98}$	$14.67^{+0.00}_{-0.00}$	$822.4^{+4.3}_{-5.0}$
$1600 - 2600$	$27.45^{+0.00}_{-0.00}$	$43.22^{+0.00}_{-0.00}$	$128.50^{+4.27}_{-5.09}$	$4.74^{+0.00}_{-0.00}$	$203.9^{+4.3}_{-5.1}$
$2600 - 3400$	$1.47^{+0.00}_{-0.00}$	$2.50^{+0.00}_{-0.00}$	$15.23^{+2.07}_{-2.24}$	$0.65^{+0.00}_{-0.00}$	$19.8^{+2.1}_{-2.2}$
$3400-$	$0.10^{+0.00}_{-0.00}$	$0.08^{+0.00}_{-0.00}$	$1.47^{+0.37}_{-0.40}$	$0.12^{+0.00}_{-0.00}$	$1.8^{+0.4}_{-0.4}$

Table 7: Yields per bin for SR 1Lepton. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.4 2LeptonOS OF

Bin [GeV]	TTbar	restbkg	SMVVV	Bkg
Inclusive	133.51 ± 5.12	91.87 ± 4.48	11.12 ± 0.00	236.5 ± 6.8
$200 - 800$	126.13 ± 5.02	86.04 ± 4.36	9.03 ± 0.00	221.2 ± 6.7
$800 - 1350$	7.02 ± 0.94	5.32 ± 0.96	1.85 ± 0.00	14.2 ± 1.3
1350−	0.36 ± 0.30	0.51 ± 0.29	0.23 ± 0.00	1.1 ± 0.4

Table 8: Yields per bin for SR 2LeptonOSOF. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	TTbar	restbkg	SMVVV	Bkg
Inclusive	$133.51^{+25.27}_{-25.27}$	$91.87^{+25.86}_{-25.86}$	$11.12^{+0.00}_{-0.00}$	$236.5^{+36.2}_{-36.2}$
$200 - 800$	$126.13^{+25.23}_{-25.23}$	$86.04^{+25.81}_{-25.81}$	$9.03^{+0.00}_{-0.00}$	$221.2^{+36.1}_{-36.1}$
$800 - 1350$	$7.02^{+1.40}_{-1.40}$	$5.32^{+1.60}_{-1.60}$	$1.85^{+0.00}_{-0.00}$	$14.2^{+2.1}_{-2.1}$
1350−	$0.36^{+0.07}_{-0.07}$	$0.51^{+0.15}_{-0.15}$	$0.23^{+0.00}_{-0.00}$	$1.1^{+0.2}_{-0.2}$

Table 9: Yields per bin for SR 2LeptonOSOF. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.5 2LeptonOS SFnoZ

Bin [GeV]	DY	restbkg	SMVVV	Bkg
Inclusive	384.72 ± 26.82	272.07 ± 7.67	8.99 ± 0.00	665.8 ± 27.9
$200 - 800$	346.60 ± 25.45	243.71 ± 7.45	7.06 ± 0.00	597.4 ± 26.5
$800 - 1050$	31.94 ± 7.08	21.36 ± 1.63	1.31 ± 0.00	54.6 ± 7.3
$1050-$	6.18 ± 4.61	7.00 ± 0.80	0.63 ± 0.00	13.8 ± 4.7

Table 10: Yields per bin for SR 2LeptonOSSFnoZ. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	DY	restbkg	SMVVV	Bkg
Inclusive	$384.72^{+45.07}_{-45.07}$	$272.07^{+73.42}_{-73.42}$	$8.99^{+0.00}_{-0.00}$	$665.8^{+86.2}_{-86.2}$
$200 - 800$	$346.60^{+40.64}_{-40.64}$	$243.71^{+73.11}_{-73.11}$	$7.06^{+0.00}_{-0.00}$	$597.4^{+83.7}_{-83.7}$
$800 - 1050$	$31.94^{+19.16}_{-19.16}$	$21.36^{+6.41}_{-6.41}$	$1.31^{+0.00}_{-0.00}$	$54.6^{+20.2}_{-20.2}$
$1050-$	$6.18^{+3.58}_{-3.58}$	$7.00^{+2.10}_{-2.10}$	$0.63^{+0.00}_{-0.00}$	$13.8^{+4.1}_{-4.1}$

Table 11: Yields per bin for SR 2LeptonOSSFnoZ. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.6 2LeptonOS SFZ

Bin [GeV]	DY	restbkg	SMVVV	Bkg
Inclusive	2229.76 ± 60.53	1114.41 ± 14.11	19.34 ± 0.00	3363.5 ± 62.2
$200 - 800$	2013.98 ± 57.00	925.01 ± 12.87	14.04 ± 0.00	2953.0 ± 58.4
$800 - 1300$	212.14 ± 20.18	177.05 ± 5.65	4.68 ± 0.00	393.9 ± 21.0
$1300-$	3.64 ± 2.71	12.35 ± 1.24	0.62 ± 0.00	16.6 ± 3.0

Table 12: Yields per bin for SR 2LeptonOSSFZ. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	DY	restbkg	SMVVV	Bkg
Inclusive	$2229.76^{+43.41}_{-43.41}$	$1114.41^{+282.56}_{-282.56}$	$19.34^{+0.00}_{-0.00}$	$3363.5^{+285.9}_{-285.9}$
$200 - 800$	$2013.98^{+39.80}_{-39.80}$	$925.01^{+277.50}_{-277.50}$	$14.04^{+0.00}_{-0.00}$	$2953.0^{+280.3}_{-280.3}$
$800 - 1300$	$212.14^{+17.31}_{-17.31}$	$177.05^{+53.12}_{-53.12}$	$4.68^{+0.00}_{-0.00}$	$393.9^{+55.9}_{-55.9}$
$1300-$	$3.64^{+0.38}_{-0.38}$	$12.35^{+3.71}_{-3.71}$	$0.62^{+0.00}_{-0.00}$	$16.6^{+3.7}_{-3.7}$

Table 13: Yields per bin for SR 2LeptonOSSFZ. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

2.7 2LeptonSS 1FJ

Bin [GeV]	DY	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	1.73 ± 0.48	27.33 ± 1.76	2.54 ± 1.47	2.30 ± 0.29	7.02 ± 1.05	0.17 ± 0.02	4.82 ± 0.22	10.14 ± 0.00	56.0 ± 2.6
$0 - 800$	1.13 ± 0.42	23.25 ± 1.62	1.43 ± 1.08	1.47 ± 0.25	3.77 ± 0.82	0.13 ± 0.01	3.00 ± 0.17	5.07 ± 0.00	39.2 ± 2.2
$800 - 1400$	0.49 ± 0.19	4.08 ± 0.68	1.11 ± 1.00	0.76 ± 0.14	3.14 ± 0.63	0.04 ± 0.01	1.76 ± 0.14	4.15 ± 0.00	15.5 ± 1.4
$1400-$	0.12 ± 0.11	0.00 ± 0.00	0.00 ± 0.00	0.06 ± 0.02	0.11 ± 0.11	0.00 ± 0.00	0.06 ± 0.04	0.92 ± 0.00	1.3 ± 0.2

Table 14: Yields per bin for SR 2LeptonSS1FJ. Backgrounds shown are Monte Carlo yields with statistical uncertainty only. Yields are quoted for the full Run 2 dataset.

Bin [GeV]	DY	TTbar	WJets	WW	WZ	ZZ	ttV	SMVVV	Bkg
Inclusive	$1.73^{+0.14}_{-0.14}$	$27.33^{+1.04}_{-1.34}$	$2.54^{+0.12}_{-0.12}$	$2.30^{+0.07}_{-0.06}$	$7.02^{+0.38}_{-0.41}$	$0.17^{+0.00}_{-0.00}$	$4.82^{+0.23}_{-0.23}$	$10.14^{+0.00}_{-0.00}$	$56.0^{+1.1}_{-1.4}$
$0 - 800$	$1.13^{+0.07}_{-0.06}$	$23.25^{+0.94}_{-1.12}$	$1.43^{+0.08}_{-0.06}$	$1.47^{+0.05}_{-0.04}$	$3.77^{+0.32}_{-0.34}$	$0.13^{+0.00}_{-0.00}$	$3.00^{+0.18}_{-0.17}$	$5.07^{+0.00}_{-0.00}$	$39.2^{+1.0}_{-1.2}$
$800 - 1400$	$0.49^{+0.04}_{-0.04}$	$4.08^{+0.44}_{-0.73}$	$1.11^{+0.09}_{-0.10}$	$0.76^{+0.04}_{-0.03}$	$3.14^{+0.21}_{-0.23}$	$0.04^{+0.00}_{-0.00}$	$1.76^{+0.15}_{-0.15}$	$4.15^{+0.00}_{-0.00}$	$15.5^{+0.5}_{-0.8}$
$1400-$	$0.12^{+0.12}_{-0.12}$	$0.00^{+0.00}_{-0.00}$	$0.00^{+0.00}_{-0.00}$	$0.06^{+0.03}_{-0.03}$	$0.11^{+0.03}_{-0.03}$	$0.00^{+0.00}_{-0.00}$	$0.06^{+0.01}_{-0.02}$	$0.92^{+0.00}_{-0.00}$	$1.3^{+0.1}_{-0.1}$

Table 15: Yields per bin for SR 2LeptonSS1FJ. Backgrounds shown are Monte Carlo yields with all systematic uncertainties added in quadrature. Yields are quoted for the full Run 2 dataset.

3 Signal Tables

3.1 0Lepton2FJ

3.1.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	77.10
$1100 - 2500$	12846.3 ± 86.1	25.79	61.94
$2500 - 4000$	64.3 ± 3.7	0.71	13.44
$4000-$	0.9 ± 0.3	0.01	1.73

Table 16: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.2 cHW

Bin [GeV]	Bkg	SMVVV	VVV cHW @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	123.31
$1100 - 2500$	12846.3 ± 86.1	25.79	109.43
$2500 - 4000$	64.3 ± 3.7	0.71	12.15
$4000-$	0.9 ± 0.3	0.01	1.73

Table 17: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHW at the 95% exclusion point. The limits on cHW are: $[-1.239, 1.168]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.3 cHWB

Bin [GeV]	Bkg	SMVVV	VVV cHWB @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	153.91
$1100 - 2500$	12846.3 ± 86.1	25.79	140.25
$2500 - 4000$	64.3 ± 3.7	0.71	12.27
$4000-$	0.9 ± 0.3	0.01	1.40

Table 18: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHWB at the 95% exclusion point. The limits on cHWB are: $[-3.967, 3.787]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.4 cHB

Bin [GeV]	Bkg	SMVVV	VVV cHB @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	138.44
$1100 - 2500$	12846.3 ± 86.1	25.79	125.07
$2500 - 4000$	64.3 ± 3.7	0.71	11.97
$4000-$	0.9 ± 0.3	0.01	1.41

Table 19: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHB at the 95% exclusion point. The limits on cHB are: $[-1.239, 1.243]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.5 cHDD

Bin [GeV]	Bkg	SMVVV	VVV cHDD @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	111.91
$1100 - 2500$	12846.3 ± 86.1	25.79	108.68
$2500 - 4000$	64.3 ± 3.7	0.71	3.18
$4000-$	0.9 ± 0.3	0.01	0.06

Table 20: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHDD at the 95% exclusion point. The limits on cHDD are: [−93.000, 56.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.6 cHbox

Bin [GeV]	Bkg	SMVVV	VVV cHbox @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	121.07
$1100 - 2500$	12846.3 ± 86.1	25.79	116.60
$2500 - 4000$	64.3 ± 3.7	0.71	4.22
$4000-$	0.9 ± 0.3	0.01	0.25

Table 21: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHbox at the 95% exclusion point. The limits on cHbox are: [−55.000, 49.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.7 cHl3

Bin [GeV]	Bkg	SMVVV	VVV cHl3 @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	260.69
$1100 - 2500$	12846.3 ± 86.1	25.79	253.66
$2500 - 4000$	64.3 ± 3.7	0.71	6.96
$4000-$	0.9 ± 0.3	0.01	0.06

Table 22: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHl3 at the 95% exclusion point. The limits on cHl3 are: [−2.870, 13.870]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.8 cHq1

Bin [GeV]	Bkg	SMVVV	VVV cHq1 @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	86.79
$1100 - 2500$	12846.3 ± 86.1	25.79	71.56
$2500 - 4000$	64.3 ± 3.7	0.71	13.56
$4000-$	0.9 ± 0.3	0.01	1.67

Table 23: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHq1 at the 95% exclusion point. The limits on cHq1 are: $[-0.281, 0.277]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.9 cHq3

Bin [GeV]	Bkg	SMVVV	VVV cHq3 @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	80.58
$1100 - 2500$	12846.3 ± 86.1	25.79	65.40
$2500 - 4000$	64.3 ± 3.7	0.71	13.47
$4000-$	0.9 ± 0.3	0.01	1.71

Table 24: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHq3 at the 95% exclusion point. The limits on cHq3 are: $[-0.209, 0.175]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.10 cll1

Bin [GeV]	Bkg	SMVVV	VVV cll1 @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	257.53
$1100 - 2500$	12846.3 ± 86.1	25.79	250.59
$2500 - 4000$	64.3 ± 3.7	0.71	6.88
$4000-$	0.9 ± 0.3	0.01	0.06

Table 25: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cll1 at the 95% exclusion point. The limits on cll1 are: [−27.700, 5.700]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.11 cHu

Bin [GeV]	Bkg	SMVVV	VVV cHu @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	97.29
$1100 - 2500$	12846.3 ± 86.1	25.79	80.98
$2500 - 4000$	64.3 ± 3.7	0.71	15.10
$4000-$	0.9 ± 0.3	0.01	1.21

Table 26: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHu at the 95% exclusion point. The limits on cHu are: $[-0.525, 0.516]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.1.12 cHd

Bin [GeV]	Bkg	SMVVV	VVV cHd @ 95% CL - SM
Inclusive	12911.6 ± 86.2	26.50	82.83
$1100 - 2500$	12846.3 ± 86.1	25.79	68.14
$2500 - 4000$	64.3 ± 3.7	0.71	12.84
4000–	0.9 ± 0.3	0.01	1.85

Table 27: Yields per bin for SR 0Lepton2FJ, including the VVV yield from cHd at the 95% exclusion point. The limits on cHd are: [−0.654, 0.659]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2 0Lepton3FJ

3.2.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	15.04
$1250 - 1500$	383.2 ± 11.4	2.52	2.03
$1500 - 1750$	123.3 ± 5.9	1.12	2.37
$1750 - 2000$	40.8 ± 2.5	0.53	2.16
$2000 - 2250$	14.3 ± 1.7	0.36	1.88
$2250 - 2500$	4.7 ± 1.1	0.16	1.58
$2500-$	4.5 ± 1.0	0.18	5.02

Table 28: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.2 cHW

Bin [GeV]	Bkg	SMVVV	VVV cHW @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	19.61
$1250 - 1500$	383.2 ± 11.4	2.52	3.70
$1500 - 1750$	123.3 ± 5.9	1.12	3.88
$1750 - 2000$	40.8 ± 2.5	0.53	3.02
$2000 - 2250$	14.3 ± 1.7	0.36	2.46
$2250 - 2500$	4.7 ± 1.1	0.16	1.92
$2500-$	4.5 ± 1.0	0.18	4.63

Table 29: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHW at the 95% exclusion point. The limits on cHW are: $[-1.239, 1.168]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.3 cHWB

Bin [GeV]	Bkg	SMVVV	VVV cHWB @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	21.66
$1250 - 1500$	383.2 ± 11.4	2.52	4.69
$1500 - 1750$	123.3 ± 5.9	1.12	4.52
$1750 - 2000$	40.8 ± 2.5	0.53	3.38
$2000 - 2250$	14.3 ± 1.7	0.36	2.75
$2250 - 2500$	4.7 ± 1.1	0.16	1.83
$2500-$	4.5 ± 1.0	0.18	4.49

Table 30: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHWB at the 95% exclusion point. The limits on cHWB are: $[-3.967, 3.787]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.4 cHB

Bin [GeV]	Bkg	SMVVV	VVV cHB @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	21.16
$1250 - 1500$	383.2 ± 11.4	2.52	4.24
$1500 - 1750$	123.3 ± 5.9	1.12	4.44
$1750 - 2000$	40.8 ± 2.5	0.53	3.35
$2000 - 2250$	14.3 ± 1.7	0.36	2.84
$2250 - 2500$	4.7 ± 1.1	0.16	1.79
2500–	4.5 ± 1.0	0.18	4.50

Table 31: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHB at the 95% exclusion point. The limits on cHB are: $[-1.239, 1.243]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.5 cHDD

Bin [GeV]	Bkg	SMVVV	VVV cHDD @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	29.23
$1250 - 1500$	383.2 ± 11.4	2.52	13.47
$1500 - 1750$	123.3 ± 5.9	1.12	6.91
$1750 - 2000$	40.8 ± 2.5	0.53	3.85
$2000 - 2250$	14.3 ± 1.7	0.36	2.11
$2250 - 2500$	4.7 ± 1.1	0.16	1.38
$2500-$	4.5 ± 1.0	0.18	1.51

Table 32: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHDD at the 95% exclusion point. The limits on cHDD are: [−93.000, 56.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.6 cHbox

Bin [GeV]	Bkg	SMVVV	VVV cHbox @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	32.16
$1250 - 1500$	383.2 ± 11.4	2.52	10.49
$1500 - 1750$	123.3 ± 5.9	1.12	8.09
$1750 - 2000$	40.8 ± 2.5	0.53	5.13
$2000 - 2250$	14.3 ± 1.7	0.36	3.14
$2250 - 2500$	4.7 ± 1.1	0.16	2.09
2500–	4.5 ± 1.0	0.18	3.22

Table 33: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHbox at the 95% exclusion point. The limits on cHbox are: [−55.000, 49.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.7 cHl3

Bin [GeV]	Bkg	SMVVV	VVV cHl3 @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	46.74
$1250 - 1500$	383.2 ± 11.4	2.52	24.23
$1500 - 1750$	123.3 ± 5.9	1.12	10.71
$1750 - 2000$	40.8 ± 2.5	0.53	5.11
$2000 - 2250$	14.3 ± 1.7	0.36	3.47
$2250 - 2500$	4.7 ± 1.1	0.16	1.55
2500–	4.5 ± 1.0	0.18	1.68

Table 34: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHl3 at the 95% exclusion point. The limits on cHl3 are: [−2.870, 13.870]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.8 cHq1

Bin [GeV]	Bkg	SMVVV	VVV cHq1 @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	16.28
$1250 - 1500$	383.2 ± 11.4	2.52	2.47
$1500 - 1750$	123.3 ± 5.9	1.12	2.70
$1750 - 2000$	40.8 ± 2.5	0.53	2.35
$2000 - 2250$	14.3 ± 1.7	0.36	2.14
$2250 - 2500$	4.7 ± 1.1	0.16	1.64
$2500-$	4.5 ± 1.0	0.18	4.97

Table 35: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHq1 at the 95% exclusion point. The limits on cHq1 are: [−0.281, 0.277]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.9 cHq3

Bin [GeV]	Bkg	SMVVV	VVV cHq3 @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	15.61
$1250 - 1500$	383.2 ± 11.4	2.52	2.19
$1500 - 1750$	123.3 ± 5.9	1.12	2.61
$1750 - 2000$	40.8 ± 2.5	0.53	2.22
$2000 - 2250$	14.3 ± 1.7	0.36	1.95
$2250 - 2500$	4.7 ± 1.1	0.16	1.62
$2500-$	4.5 ± 1.0	0.18	5.02

Table 36: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHq3 at the 95% exclusion point. The limits on cHq3 are: $[-0.209, 0.175]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.10 cll1

Bin [GeV]	Bkg	SMVVV	VVV cll1 @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	44.47
$1250 - 1500$	383.2 ± 11.4	2.52	23.04
$1500 - 1750$	123.3 ± 5.9	1.12	10.19
$1750 - 2000$	40.8 ± 2.5	0.53	4.86
$2000 - 2250$	14.3 ± 1.7	0.36	3.30
$2250 - 2500$	4.7 ± 1.1	0.16	1.48
$2500-$	4.5 ± 1.0	0.18	1.60

Table 37: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cll1 at the 95% exclusion point. The limits on cll1 are: [−27.700, 5.700]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.11 cHu

Bin [GeV]	Bkg	SMVVV	VVV cHu @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	17.18
$1250 - 1500$	383.2 ± 11.4	2.52	2.75
$1500 - 1750$	123.3 ± 5.9	1.12	2.93
$1750 - 2000$	40.8 ± 2.5	0.53	2.54
$2000 - 2250$	14.3 ± 1.7	0.36	2.39
$2250 - 2500$	4.7 ± 1.1	0.16	1.74
2500–	4.5 ± 1.0	0.18	4.84

Table 38: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHu at the 95% exclusion point. The limits on cHu are: $[-0.525, 0.516]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.2.12 cHd

Bin [GeV]	Bkg	SMVVV	VVV cHd @ 95% CL - SM
Inclusive	570.8 ± 13.3	4.87	17.17
$1250 - 1500$	383.2 ± 11.4	2.52	2.85
$1500 - 1750$	123.3 ± 5.9	1.12	3.01
$1750 - 2000$	40.8 ± 2.5	0.53	2.67
$2000 - 2250$	14.3 ± 1.7	0.36	2.05
$2250 - 2500$	4.7 ± 1.1	0.16	1.63
2500–	4.5 ± 1.0	0.18	4.96

Table 39: Yields per bin for SR 0Lepton3FJ, including the VVV yield from cHd at the 95% exclusion point. The limits on cHd are: [−0.654, 0.659]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3 1Lepton

3.3.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	22.01
$500 - 1600$	822.4 ± 4.6	14.67	4.76
$1600 - 2600$	203.9 ± 4.7	4.74	9.70
$2600 - 3400$	19.8 ± 2.2	0.65	4.31
3400−	1.8 ± 0.4	0.12	3.24

Table 40: Yields per bin for SR 1Lepton, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.2 cHW

Bin [GeV]	Bkg	SMVVV	VVV cHW @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	29.78
$500 - 1600$	822.4 ± 4.6	14.67	9.16
$1600 - 2600$	203.9 ± 4.7	4.74	13.18
$2600 - 3400$	19.8 ± 2.2	0.65	4.60
3400−	1.8 ± 0.4	0.12	2.85

Table 41: Yields per bin for SR 1Lepton, including the VVV yield from cHW at the 95% exclusion point. The limits on cHW are: [−1.239, 1.168]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.3 cHWB

Bin [GeV]	Bkg	SMVVV	VVV cHWB @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	35.12
$500 - 1600$	822.4 ± 4.6	14.67	12.37
$1600 - 2600$	203.9 ± 4.7	4.74	15.34
$2600 - 3400$	19.8 ± 2.2	0.65	5.01
$3400-$	1.8 ± 0.4	0.12	2.40

Table 42: Yields per bin for SR 1Lepton, including the VVV yield from cHWB at the 95% exclusion point. The limits on cHWB are: $[-3.967, 3.787]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.4 cHB

Bin [GeV]	Bkg	SMVVV	VVV cHB @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	33.13
$500 - 1600$	822.4 ± 4.6	14.67	10.47
$1600 - 2600$	203.9 ± 4.7	4.74	15.06
$2600 - 3400$	19.8 ± 2.2	0.65	5.13
3400−	1.8 ± 0.4	0.12	2.46

Table 43: Yields per bin for SR 1Lepton, including the VVV yield from cHB at the 95% exclusion point. The limits on cHB are: $[-1.239, 1.243]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.5 cHDD

Bin [GeV]	Bkg	SMVVV	VVV cHDD @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	54.25
$500 - 1600$	822.4 ± 4.6	14.67	37.63
$1600 - 2600$	203.9 ± 4.7	4.74	14.32
$2600 - 3400$	19.8 ± 2.2	0.65	1.79
$3400-$	1.8 ± 0.4	0.12	0.51

Table 44: Yields per bin for SR 1Lepton, including the VVV yield from cHDD at the 95% exclusion point. The limits on cHDD are: [−93.000, 56.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.6 cHbox

Bin [GeV]	Bkg	SMVVV	VVV cHbox @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	60.50
$500 - 1600$	822.4 ± 4.6	14.67	39.90
$1600 - 2600$	203.9 ± 4.7	4.74	17.30
$2600 - 3400$	19.8 ± 2.2	0.65	2.60
$3400-$	1.8 ± 0.4	0.12	0.70

Table 45: Yields per bin for SR 1Lepton, including the VVV yield from cHbox at the 95% exclusion point. The limits on cHbox are: [−55.000, 49.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.7 cHl3

Bin [GeV]	Bkg	SMVVV	VVV cHl3 @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	63.57
$500 - 1600$	822.4 ± 4.6	14.67	46.21
$1600 - 2600$	203.9 ± 4.7	4.74	14.94
$2600 - 3400$	19.8 ± 2.2	0.65	2.04
$3400-$	1.8 ± 0.4	0.12	0.38

Table 46: Yields per bin for SR 1Lepton, including the VVV yield from cHl3 at the 95% exclusion point. The limits on cHl3 are: [−2.870, 13.870]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.8 cHq1

Bin [GeV]	Bkg	SMVVV	VVV cHq1 @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	23.75
$500 - 1600$	822.4 ± 4.6	14.67	5.88
$1600 - 2600$	203.9 ± 4.7	4.74	10.28
$2600 - 3400$	19.8 ± 2.2	0.65	4.39
3400−	1.8 ± 0.4	0.12	3.21

Table 47: Yields per bin for SR 1Lepton, including the VVV yield from cHq1 at the 95% exclusion point. The limits on cHq1 are: [−0.281, 0.277]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.9 cHq3

Bin [GeV]	Bkg	SMVVV	VVV cHq3 @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	22.61
$500 - 1600$	822.4 ± 4.6	14.67	5.03
$1600 - 2600$	203.9 ± 4.7	4.74	10.12
$2600 - 3400$	19.8 ± 2.2	0.65	4.24
3400−	1.8 ± 0.4	0.12	3.23

Table 48: Yields per bin for SR 1Lepton, including the VVV yield from cHq3 at the 95% exclusion point. The limits on cHq3 are: [−0.209, 0.175]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.10 cll1

Bin [GeV]	Bkg	SMVVV	VVV cll1 @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	60.60
$500 - 1600$	822.4 ± 4.6	14.67	44.05
$1600 - 2600$	203.9 ± 4.7	4.74	14.24
$2600 - 3400$	19.8 ± 2.2	0.65	1.94
$3400-$	1.8 ± 0.4	0.12	0.36

Table 49: Yields per bin for SR 1Lepton, including the VVV yield from cll1 at the 95% exclusion point. The limits on cll1 are: $[-27.700, 5.700]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.11 cHu

Bin [GeV]	Bkg	SMVVV	VVV cHu @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	26.20
$500 - 1600$	822.4 ± 4.6	14.67	6.89
$1600 - 2600$	203.9 ± 4.7	4.74	11.63
$2600 - 3400$	19.8 ± 2.2	0.65	4.67
$3400-$	1.8 ± 0.4	0.12	3.02

Table 50: Yields per bin for SR 1Lepton, including the VVV yield from cHu at the 95% exclusion point. The limits on cHu are: $[-0.525, 0.516]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.3.12 cHd

Bin [GeV]	Bkg	SMVVV	VVV cHd @ 95% CL - SM
Inclusive	1047.9 ± 6.9	20.19	26.99
$500 - 1600$	822.4 ± 4.6	14.67	7.27
$1600 - 2600$	203.9 ± 4.7	4.74	12.06
$2600 - 3400$	19.8 ± 2.2	0.65	4.70
3400−	1.8 ± 0.4	0.12	2.96

Table 51: Yields per bin for SR 1Lepton, including the VVV yield from cHd at the 95% exclusion point. The limits on cHd are: $[-0.654, 0.659]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.4 2LeptonOS OF

3.4.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	236.5 ± 36.8	11.12	8.53
$200 - 800$	221.2 ± 36.7	9.03	2.05
$800 - 1350$	14.2 ± 2.5	1.85	3.30
$1350-$	1.1 ± 0.4	0.23	3.18

Table 52: Yields per bin for SR 2LeptonOSOF, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.5 2LeptonOS SFnoZ

3.5.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	665.8 ± 90.6	8.99	21.12
$200 - 800$	597.4 ± 87.8	7.06	4.81
$800 - 1050$	54.6 ± 21.5	1.31	3.94
$1050-$	13.8 ± 6.3	0.63	12.38

Table 53: Yields per bin for SR 2LeptonOSSFnoZ, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.6 2LeptonOS SFZ

3.6.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	3363.5 ± 292.6	19.34	26.39
$200 - 800$	2953.0 ± 286.4	14.04	5.47
$800 - 1300$	393.9 ± 59.7	4.68	9.80
$1300-$	16.6 ± 4.8	0.62	11.12

Table 54: Yields per bin for SR 2LeptonOSSFZ, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: $[-0.103, 0.100]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7 2LeptonSS 1FJ

3.7.1 cW

Bin [GeV]	Bkg	SMVVV	VVV cW @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	6.21
$0 - 800$	39.2 ± 2.4	5.07	0.51
$800 - 1400$	15.5 ± 1.5	4.15	2.24
1400−	1.3 ± 0.2	0.92	3.46

Table 55: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cW at the 95% exclusion point. The limits on cW are: [−0.103, 0.100]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.2 cHW

Bin [GeV]	Bkg	SMVVV	VVV cHW @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	8.27
$0 - 800$	39.2 ± 2.4	5.07	1.35
$800 - 1400$	15.5 ± 1.5	4.15	3.78
$1400-$	1.3 ± 0.2	0.92	3.14

Table 56: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHW at the 95% exclusion point. The limits on cHW are: $[-1.239, 1.168]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.3 cHWB

Bin [GeV]	Bkg	SMVVV	VVV cHWB @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	10.12
$0 - 800$	39.2 ± 2.4	5.07	2.52
$800 - 1400$	15.5 ± 1.5	4.15	4.87
1400–	1.3 ± 0.2	0.92	2.72

Table 57: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHWB at the 95% exclusion point. The limits on cHWB are: [−3.967, 3.787]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.4 cHB

Bin [GeV]	Bkg	SMVVV	VVV cHB @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	8.81
$0 - 800$	39.2 ± 2.4	5.07	1.73
$800 - 1400$	15.5 ± 1.5	4.15	4.17
1400−	1.3 ± 0.2	0.92	2.91

Table 58: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHB at the 95% exclusion point. The limits on cHB are: [−1.239, 1.243]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.5 cHDD

Bin [GeV]	Bkg	SMVVV	VVV cHDD @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	12.72
$0 - 800$	39.2 ± 2.4	5.07	6.04
$800 - 1400$	15.5 ± 1.5	4.15	5.33
1400–	1.3 ± 0.2	0.92	1.35

Table 59: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHDD at the 95% exclusion point. The limits on cHDD are: [−93.000, 56.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.6 cHbox

Bin [GeV]	Bkg	SMVVV	VVV cHbox @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	13.98
$0 - 800$	39.2 ± 2.4	5.07	6.24
$800 - 1400$	15.5 ± 1.5	4.15	6.07
1400−	1.3 ± 0.2	0.92	1.67

Table 60: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHbox at the 95% exclusion point. The limits on cHbox are: [−55.000, 49.000]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.7 cHl3

Bin [GeV]	Bkg	SMVVV	VVV cHl3 @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	15.25
$0 - 800$	39.2 ± 2.4	5.07	7.62
$800 - 1400$	15.5 ± 1.5	4.15	6.24
1400−	1.3 ± 0.2	0.92	1.39

Table 61: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHl3 at the 95% exclusion point. The limits on cHl3 are: [−2.870, 13.870]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.8 cHq1

Bin [GeV]	Bkg	SMVVV	VVV cHq1 @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	6.75
$0 - 800$	39.2 ± 2.4	5.07	0.83
$800 - 1400$	15.5 ± 1.5	4.15	2.50
$1400-$	1.3 ± 0.2	0.92	3.42

Table 62: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHq1 at the 95% exclusion point. The limits on cHq1 are: $[-0.281, 0.277]$. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.9 cHq3

Bin [GeV]	Bkg	SMVVV	VVV cHq3 @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	6.26
$0 - 800$	39.2 ± 2.4	5.07	0.57
$800 - 1400$	15.5 ± 1.5	4.15	2.30
1400−	1.3 ± 0.2	0.92	3.40

Table 63: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHq3 at the 95% exclusion point. The limits on cHq3 are: [−0.209, 0.175]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.10 cll1

Bin [GeV]	Bkg	SMVVV	VVV cll1 @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	15.25
$0 - 800$	39.2 ± 2.4	5.07	7.62
$800 - 1400$	15.5 ± 1.5	4.15	6.24
$1400-$	1.3 ± 0.2	0.92	1.39

Table 64: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cll1 at the 95% exclusion point. The limits on cll1 are: [−27.700, 5.700]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.11 cHu

Bin [GeV]	Bkg	SMVVV	VVV cHu @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	7.17
$0 - 800$	39.2 ± 2.4	5.07	0.83
$800 - 1400$	15.5 ± 1.5	4.15	3.02
1400−	1.3 ± 0.2	0.92	3.32

Table 65: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHu at the 95% exclusion point. The limits on cHu are: [−0.525, 0.516]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.

3.7.12 cHd

Bin [GeV]	Bkg	SMVVV	VVV cHd @ 95% CL - SM
Inclusive	56.0 ± 2.9	10.14	8.08
$0 - 800$	39.2 ± 2.4	5.07	1.03
$800 - 1400$	15.5 ± 1.5	4.15	3.94
1400−	1.3 ± 0.2	0.92	3.11

Table 66: Yields per bin for SR 2LeptonSS1FJ, including the VVV yield from cHd at the 95% exclusion point. The limits on cHd are: [−0.654, 0.659]. All Monte Carlo background yields have been combined, and the statistical uncertainties and symmetrized systematic uncertainties for the total background are added in quadrature. Yields are quoted for the full Run 2 dataset.