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27 October

	tW	ttbar	WW	WZ	ZZ	DYToTauTau	BG	DATA
M = 250	11.31 ± 0.49	49.69 ± 0.42	38.37 ± 1.33	2.65 ± 0.13	0.02 ± 0.01	1.77 ± 1.77	103.81 ± 2.31	115

26 October

Does this even make any sense,

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	DYToTauTau	BG	DATA
0 jet	36.75 ± 0.88	246.06 ± 0.93	7.39 ± 0.22	90.42 ± 2.04	0.09 ± 0.01	3.64 ± 0.66	31.90 ± 7.52	416.26 ± 7.93	538
1 jet	67.55 ± 1.19	753.78 ± 1.62	0.43 ± 0.05	5.32 ± 0.50	0.01 ± 0.00	0.12 ± 0.12	3.54 ± 2.51	830.75 ± 3.25	760
2 jet	16.68 ± 0.59	535.30 ± 1.37	0.03 ± 0.01	0.37 ± 0.13	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	552.38 ± 1.50	471
3 jet	0.94 ± 0.14	41.17 ± 0.38	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	42.11 ± 0.40	40

23 October

Made some new ntuples (details) and new Higgs numbers. I uncovered a change in the name of the double electron analysis

19 October

More b-jet numbers

	ZZ	WZ	WW	ttbar	tW	DYToMuMu	BG	DATA
0 jet	21.62 ± 0.30	14.62 ± 0.35	8.66 ± 0.73	24.40 ± 0.33	4.37 ± 0.35	19.54 ± 1.76	93.21 ± 2.01	114
1 jet	0.73 ± 0.06	0.74 ± 0.08	0.55 ± 0.18	73.44 ± 0.58	7.72 ± 0.47	4.39 ± 0.81	87.57 ± 1.12	100
2 jet	0.03 ± 0.01	0.02 ± 0.01	0.00 ± 0.00	50.70 ± 0.48	1.57 ± 0.21	0.09 ± 0.08	52.41 ± 0.53	60
3 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	3.70 ± 0.13	0.14 ± 0.06	0.00 ± 0.00	3.85 ± 0.14	2

17 October

Test tables

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	BG	DATA
single lepton	34224.46	33918.34	1176.33	8256.50	343.11	2533100.27	2611019.02	11985727
HLT selection/weights	34224.46	33918.34	1176.33	8256.50	343.11	2533100.27	2611019.02	7642710
Good PV	34223.03	33917.01	1175.55	8246.86	342.67	2529517.00	2607422.12	7586132
Data quality	34223.03	33917.01	1175.55	8246.86	342.67	2529517.00	2607422.12	7586132
Cosmics rejection	34222.77	33915.29	1175.38	8246.16	342.63	2526951.77	2604854.00	7583398
Dilepton	237.28	2170.58	207.13	523.74	91.07	823911.20	827141.00	874587
Z mass	52.37	486.48	169.05	124.81	82.49	748347.51	749262.72	784504
Z p_T	45.86	425.35	134.39	86.01	67.59	156487.77	157246.97	168379
3rd lepton veto	45.71	423.45	79.08	85.81	67.54	156307.66	157009.26	168069
b-jet veto	15.20	69.54	75.62	84.04	65.83	148032.33	148342.56	156855

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	GluGlu	VBF	BG	Signal	S/B	Significance	DATA
250	3.59 ± 0.31	15.50 ± 0.27	11.76 ± 0.31	8.90 ± 0.72	14.47 ± 0.24	5.28 ± 0.86	7.91 ± 0.10	0.76 ± 0.01	59.50 ± 1.26	8.68 ± 0.10	0.15 ± 0.00	1.05 ± 0.00	78
300	0.62 ± 0.13	3.01 ± 0.12	4.23 ± 0.19	1.11 ± 0.27	7.23 ± 0.17	1.13 ± 0.40	5.96 ± 0.07	0.56 ± 0.01	17.33 ± 0.57	6.52 ± 0.07	0.38 ± 0.01	1.33 ± 0.01	20
350	0.16 ± 0.07	0.65 ± 0.05	2.61 ± 0.15	0.01 ± 0.00	5.12 ± 0.15	0.57 ± 0.32	6.07 ± 0.07	0.45 ± 0.01	9.12 ± 0.39	6.52 ± 0.07	0.72 ± 0.03	1.65 ± 0.01	4
400	0.11 ± 0.06	0.18 ± 0.03	1.71 ± 0.12	0.00 ± 0.00	3.84 ± 0.13	0.69 ± 0.33	5.27 ± 0.06	0.32 ± 0.01	6.52 ± 0.38	5.59 ± 0.06	0.86 ± 0.05	1.61 ± 0.02	7
450	0.01 ± 0.01	0.04 ± 0.01	1.29 ± 0.11	0.01 ± 0.01	3.00 ± 0.12	0.14 ± 0.09	3.64 ± 0.04	0.24 ± 0.00	4.49 ± 0.19	3.88 ± 0.04	0.86 ± 0.04	1.34 ± 0.01	6
500	0.00 ± 0.00	0.01 ± 0.01	0.87 ± 0.09	0.01 ± 0.01	2.35 ± 0.11	0.17 ± 0.10	2.29 ± 0.02	0.19 ± 0.00	3.43 ± 0.17	2.48 ± 0.02	0.72 ± 0.04	1.02 ± 0.01	6
550	0.00 ± 0.00	0.01 ± 0.01	0.59 ± 0.07	0.01 ± 0.01	1.83 ± 0.10	0.27 ± 0.19	1.41 ± 0.02	0.16 ± 0.00	2.71 ± 0.23	1.57 ± 0.02	0.58 ± 0.05	0.76 ± 0.02	2
600	0.00 ± 0.00	0.00 ± 0.00	0.38 ± 0.06	0.01 ± 0.01	1.33 ± 0.09	0.25 ± 0.19	0.86 ± 0.01	0.17 ± 0.00	1.98 ± 0.21	1.03 ± 0.01	0.52 ± 0.06	0.60 ± 0.02	2

13 October

For Radek

- Muons

	ZZ	WZ	WW	ttbar	tW	DYToMuMu	DATA	BG
0 jet	22.33 ± 0.29	14.77 ± 0.33	11.24 ± 0.77	19.07 ± 0.28	4.19 ± 0.32	25.39 ± 1.87	107	97.00 ± 2.11
1 jet	0.84 ± 0.06	0.86 ± 0.08	0.85 ± 0.22	64.73 ± 0.51	7.70 ± 0.44	4.92 ± 0.79	87	79.89 ± 1.07
2 jet	0.02 ± 0.01	0.03 ± 0.01	0.01 ± 0.01	52.93 ± 0.46	1.87 ± 0.22	0.25 ± 0.18	63	55.11 ± 0.54
3 jet	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00	4.44 ± 0.13	0.15 ± 0.06	0.00 ± 0.00	4	4.60 ± 0.15

- Electrons

	ZZ	WZ	WW	ttbar	DYToEE	tW	DATA	BG
0 jet	16.11 ± 0.25	11.22 ± 0.29	8.73 ± 0.68	12.98 ± 0.23	13.02 ± 1.30	3.08 ± 0.28	79	65.13 ± 1.55
1 jet	0.63 ± 0.05	0.56 ± 0.06	0.76 ± 0.21	45.30 ± 0.43	4.85 ± 0.84	5.38 ± 0.37	59	57.48 ± 1.04
2 jet	0.04 ± 0.01	0.03 ± 0.02	0.03 ± 0.02	36.81 ± 0.38	0.40 ± 0.18	1.61 ± 0.20	33	38.93 ± 0.47
3 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	2.98 ± 0.11	0.00 ± 0.00	0.17 ± 0.07	2	3.15 ± 0.13

11 October

For Radek

	ZZ	WZ	WW	ttbar	tW	DYToMuMu	DATA	BG
0 jet	18.62 ± 0.26	10.98 ± 0.28	6.90 ± 0.60	10.07 ± 0.20	2.50 ± 0.25	29.71 ± 1.96	61	78.78 ± 2.11
1 jet	1.05 ± 0.06	1.57 ± 0.11	0.82 ± 0.22	48.17 ± 0.44	6.30 ± 0.40	5.94 ± 0.85	68	63.85 ± 1.07
2 jet	0.07 ± 0.02	0.10 ± 0.03	0.01 ± 0.01	52.81 ± 0.46	2.05 ± 0.23	0.40 ± 0.24	66	55.43 ± 0.57
3 jet	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	6.55 ± 0.16	0.25 ± 0.08	0.00 ± 0.00	8	6.81 ± 0.18

	tW	ttbar	WZ	WW	ZZ	PhotonJets	GluGlu	VBF	DATA	BG	Signal	S/B	Significance
250	1.49 ± 0.19	6.46 ± 0.18	5.57 ± 0.20	4.10 ± 0.46	7.85 ± 0.16	2.32 ± 0.48	3.69 ± 0.06	0.52 ± 0.01	22	27.80 ± 0.76	4.21 ± 0.06	0.15 ± 0.00	0.74 ± 0.00
300	0.59 ± 0.12	2.87 ± 0.12	3.17 ± 0.15	1.00 ± 0.22	6.21 ± 0.15	0.75 ± 0.28	4.23 ± 0.06	0.46 ± 0.01	10	14.59 ± 0.45	4.70 ± 0.06	0.32 ± 0.01	1.07 ± 0.01
350	0.19 ± 0.07	0.92 ± 0.07	1.77 ± 0.11	0.16 ± 0.10	4.47 ± 0.13	0.71 ± 0.34	4.93 ± 0.06	0.37 ± 0.01	7	8.23 ± 0.41	5.30 ± 0.06	0.64 ± 0.03	1.44 ± 0.01
400	0.11 ± 0.06	0.37 ± 0.04	1.67 ± 0.11	0.04 ± 0.02	4.39 ± 0.13	1.17 ± 0.39	4.26 ± 0.05	0.29 ± 0.00	4	7.76 ± 0.43	4.55 ± 0.05	0.59 ± 0.03	1.30 ± 0.01
500	0.06 ± 0.04	0.19 ± 0.03	1.66 ± 0.11	0.01 ± 0.01	4.49 ± 0.13	1.29 ± 0.41	1.72 ± 0.02	0.19 ± 0.00	5	7.70 ± 0.45	1.90 ± 0.02	0.25 ± 0.01	0.61 ± 0.01
600	0.03 ± 0.03	0.04 ± 0.02	1.13 ± 0.09	0.01 ± 0.01	3.51 ± 0.12	0.61 ± 0.27	0.77 ± 0.01	0.16 ± 0.00	3	5.33 ± 0.31	0.92 ± 0.01	0.17 ± 0.01	0.37 ± 0.01

6 October

HZZllnunu

- Include Radek's numbers into table.
- Add signal (gg plus VBF) over BG and significance to table.
- Redo yields with Andrey's MET cut for masses 250-300.

- test table:

	tW	ttbar	WZ	WW	ZZ	PhotonJets	Signal	VBF	DATA	BG	S/B	Significance
250	2.15 ± 0.23	7.87 ± 0.20	8.00 ± 0.24	7.31 ± 0.62	11.27 ± 0.20	6.31 ± 2.65	4.77 ± 0.07	0.60 ± 0.01	40	42.91 ± 2.76	0.13 ± 0.01	0.77 ± 0.01
300	0.87 ± 0.14	3.88 ± 0.14	5.13 ± 0.19	2.17 ± 0.34	8.97 ± 0.18	2.18 ± 0.65	5.09 ± 0.06	0.54 ± 0.01	21	23.21 ± 0.80	0.24 ± 0.01	1.05 ± 0.01
350	0.34 ± 0.09	1.42 ± 0.08	3.26 ± 0.15	0.67 ± 0.19	7.35 ± 0.17	1.59 ± 0.47	6.15 ± 0.07	0.46 ± 0.01	12	14.62 ± 0.57	0.45 ± 0.02	1.43 ± 0.01
400	0.13 ± 0.06	0.48 ± 0.05	2.38 ± 0.13	0.11 ± 0.08	5.77 ± 0.15	2.39 ± 0.55	4.72 ± 0.05	0.33 ± 0.01	5	11.26 ± 0.60	0.45 ± 0.02	1.25 ± 0.01
500	0.06 ± 0.04	0.19 ± 0.03	1.66 ± 0.11	0.01 ± 0.01	4.49 ± 0.13	1.98 ± 0.52	1.72 ± 0.02	0.19 ± 0.00	5	8.38 ± 0.56	0.23 ± 0.02	0.59 ± 0.01
600	0.03 ± 0.03	0.04 ± 0.02	1.13 ± 0.09	0.01 ± 0.01	3.51 ± 0.12	1.23 ± 0.44	0.77 ± 0.01	0.16 ± 0.00	3	5.95 ± 0.47	0.16 ± 0.01	0.35 ± 0.01

4 October

HZZllnunu

	tW	ttbar	WZ	WW	ZZ	DYToEE	DATA	BG
Generated	1624374	10340000	205000	211000	220000	29500000		
single lepton	28762.61	34486.83	965.56	6777.18	281.64	2055759.25	26884304	2127033.07
HLT selection/weights	28762.61	34486.83	965.56	6777.18	281.64	2055759.25	12042889	2127033.07
Good PV	28761.41	34485.48	964.55	6766.58	281.21	2051712.82	12041675	2122972.05
Data quality	28761.41	34485.48	964.55	6766.58	281.21	2051712.82	12041675	2122972.05
Cosmics rejection	28761.19	34483.73	964.41	6766.01	281.18	2051712.82	12041675	2122969.34
Dilepton	140.47	1545.34	149.04	292.21	51.59	455634.63	389670	457813.29
Z mass	31.71	342.84	107.12	71.01	47.04	418438.63	352422	419038.35
Z p_T	28.07	302.62	86.29	49.74	38.68	89233.27	76989	89738.66
3rd lepton veto	25.68	267.52	45.10	49.48	38.55	88506.44	76206	88932.77
b-jet veto	5.81	23.23	40.11	46.66	36.65	78657.28	65315	78809.74

	tW	ttbar	WZ	WW	ZZ	DYToEE	Signal	VBF	DATA	BG
250	1.18 ± 0.17	4.94 ± 0.15	5.05 ± 0.19	5.50 ± 0.52	7.46 ± 0.16	4.61 ± 0.69	3.28 ± 0.06	0.42 ± 0.01	28	28.75 ± 0.92
300	0.72 ± 0.13	2.32 ± 0.11	3.60 ± 0.16	1.59 ± 0.27	6.00 ± 0.14	0.59 ± 0.25	3.60 ± 0.05	0.38 ± 0.01	22	14.81 ± 0.46
350	0.24 ± 0.07	0.92 ± 0.07	2.66 ± 0.14	0.37 ± 0.13	4.90 ± 0.13	0.47 ± 0.27	4.40 ± 0.05	0.34 ± 0.01	11	9.57 ± 0.37
400	0.07 ± 0.03	0.33 ± 0.04	1.79 ± 0.11	0.16 ± 0.08	4.06 ± 0.12	0.75 ± 0.33	3.42 ± 0.04	0.24 ± 0.00	10	7.15 ± 0.38
500	0.03 ± 0.02	0.13 ± 0.03	1.32 ± 0.10	0.11 ± 0.08	3.23 ± 0.11	0.16 ± 0.12	1.31 ± 0.02	0.14 ± 0.00	6	4.99 ± 0.21
600	0.03 ± 0.02	0.05 ± 0.02	0.85 ± 0.08	0.11 ± 0.08	2.55 ± 0.10	0.22 ± 0.14	0.57 ± 0.01	0.12 ± 0.00	2	3.81 ± 0.21

Muons

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	DATA	BG
Generated	1624374	10340000	205000	211000	220000	29700000		
single lepton	28762.61	25716.18	965.56	6777.18	281.64	1561825.18	8302580	1624328.35
HLT selection/weights	28762.61	25716.18	965.56	6777.18	281.64	1561825.18	5036176	1624328.35
Good PV	28761.41	25715.15	964.55	6766.58	281.21	1559373.99	4967397	1621862.90
Data quality	28761.41	25715.15	964.55	6766.58	281.21	1559373.99	4967397	1621862.90
Cosmics rejection	28761.19	25713.79	964.41	6766.01	281.18	1557790.94	4965668	1620277.52
Dilepton	212.02	1705.18	181.88	460.80	79.90	532070.05	538940	534709.82
Z mass	46.75	381.88	148.32	109.68	72.36	483284.81	483438	484043.81
Z p_T	40.93	333.80	117.97	75.66	59.32	101080.74	103847	101708.42
3rd lepton veto	37.58	294.63	63.13	74.99	59.05	100125.48	102631	100654.86
b-jet veto	9.19	25.87	55.27	71.44	56.25	89114.96	87835	89332.98

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	Signal	VBF	DATA	BG
250	2.15 ± 0.23	5.70 ± 0.17	8.00 ± 0.24	7.31 ± 0.62	11.27 ± 0.20	4.94 ± 0.73	4.77 ± 0.07	0.60 ± 0.01	32	39.37 ± 1.04
300						1.79 ± 0.46			17	

	tW	ttbar	WZ	WW	ZZ	DYToMuMu	Signal	VBF	DATA	BG
	0.87 ± 0.14	2.74 ± 0.11	5.13 ± 0.19	2.17 ± 0.34	8.97 ± 0.18		5.09 ± 0.06	0.54 ± 0.01		21.68 ± 0.66
350	0.34 ± 0.09	0.97 ± 0.07	3.26 ± 0.15	0.67 ± 0.19	7.35 ± 0.17	1.48 ± 0.47	6.15 ± 0.07	0.46 ± 0.01	9	14.06 ± 0.57
400	0.13 ± 0.06	0.32 ± 0.04	2.38 ± 0.13	0.11 ± 0.08	5.77 ± 0.15	2.19 ± 0.54	4.72 ± 0.05	0.33 ± 0.01	4	10.91 ± 0.59
500	0.06 ± 0.04	0.12 ± 0.02	1.66 ± 0.11	0.01 ± 0.01	4.49 ± 0.13	1.22 ± 0.39	1.72 ± 0.02	0.19 ± 0.00	4	7.56 ± 0.43
600	0.03 ± 0.03	0.03 ± 0.01	1.13 ± 0.09	0.01 ± 0.01	3.51 ± 0.12	0.56 ± 0.26	0.77 ± 0.01	0.16 ± 0.00	3	5.27 ± 0.30

3 October

HZZllnunu

Need to put together numbers for tomorrow. I'm going to need:

- Include efficiencies for triggers (with p_T parametrization) and lepton reconstruction.
- Calculate VBF signal cross-sections. Also, include samples in analysis.
- Send Radek the input for his ttbar estimation, e.g., b-jet multiplicity with MET > 70 GeV.

Muons

	DYToMuMu	ZZ	WZ	WW	ttbar	tW	DATA	BG
0 jet	50.82 ± 2.37	20.47 ± 0.26	12.89 ± 0.29	10.45 ± 0.71	14.04 ± 0.25	3.20 ± 0.26	87	111.87 ± 2.53
1 jet	12.50 ± 1.19	1.10 ± 0.06	1.75 ± 0.11	0.97 ± 0.23	66.01 ± 0.55	7.11 ± 0.40	96	89.45 ± 1.39
2 jet	0.87 ± 0.35	0.06 ± 0.01	0.13 ± 0.03	0.01 ± 0.01	72.66 ± 0.57	2.27 ± 0.23	76	76.00 ± 0.71
3 jet	0.00 ± 0.00	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	8.43 ± 0.19	0.27 ± 0.08	8	8.70 ± 0.21

Electrons

	DYToEE	ZZ	WZ	WW	ttbar	tW	DATA	BG
0 jet	23.74 ± 1.44	12.78 ± 0.20	8.44 ± 0.22	7.37 ± 0.56	6.77 ± 0.15	1.96 ± 0.19	67	61.06 ± 1.59
1 jet	7.88 ± 0.90	0.72 ± 0.05	1.10 ± 0.08	0.69 ± 0.17	32.43 ± 0.32	4.54 ± 0.30	59	47.35 ± 1.02
2 jet	0.90 ± 0.30	0.03 ± 0.01	0.06 ± 0.02	0.02 ± 0.02	35.92 ± 0.34	1.68 ± 0.18	45	38.62 ± 0.49
3 jet	0.09 ± 0.09	0.01 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	4.27 ± 0.12	0.13 ± 0.05	4	4.51 ± 0.16

2 October

HZZllnunu

Need to put together numbers for tomorrow. I'm going to need:

- both electrons and muons with the Z+jets background from the photon data
- The ttbar sample should be rescaled so the the b-jet multiplicity matches for the 2-jet bin.
- Include efficiencies for triggers (with p_T parametrization) and lepton reconstruction.
- Update selection information on twiki and submit revisions of the code for Anton.

BRM

Look at some recent TDC data, and fit (linear?) the albedo before some non-colliding bunches.

30 September

More test tables (ZJets from data)

- **Some plots**

	tW	ttbar	WZ	WW	ZZ	ZJets	DATA	BG
single lepton	28762.61	27841.15	965.56	6777.18	281.64	33443762.00	9883487	33508390.14
HLT selection/weights	28762.61	27841.15	965.56	6777.18	281.64	1801594.00	6158706	1866222.14
Good PV	28761.41	27840.06	964.55	6766.58	281.21	1798165.00	6079793	1862778.81
Data quality	28761.41	27840.06	964.55	6766.58	281.21	1798165.00	6079793	1862778.81
Cosmics rejection	28761.19	27838.64	964.41	6766.01	281.18	1798165.00	6077699	1862776.44
Dilepton	192.58	1720.71	165.26	419.14	72.58	186820.80	663854	189391.07
Z mass	42.46	385.27	134.76	99.77	65.73	186603.28	595395	187331.26
Z p_T	37.16	336.86	107.13	68.77	53.86	131129.88	127819	131733.66
3rd lepton veto	34.13	297.47	57.33	68.17	53.61	118121.15	126314	118631.85
b-jet veto	10.19	40.33	54.31	66.17	51.96	105934.36	115776	106157.32

	tW	ttbar	WZ	WW	ZZ	ZJets (Data)	Signal	DATA	BG
HZZ250	2.02 ± 0.21	7.03 ± 0.16	6.78 ± 0.21	6.05 ± 0.53	9.76 ± 0.17	16.69 ± 9.85	4.43 ± 0.07	40	48.33 ± 9.87
HZZ300	0.89 ± 0.14	3.75 ± 0.12	4.73 ± 0.18	1.83 ± 0.30	7.98 ± 0.16	3.99 ± 1.48	4.96 ± 0.06	19	23.17 ± 1.54
HZZ350	0.36 ± 0.09	1.46 ± 0.07	3.21 ± 0.15	0.49 ± 0.16	6.69 ± 0.15	2.54 ± 0.98	6.13 ± 0.07	13	14.74 ± 1.02
HZZ400	0.17 ± 0.06	0.52 ± 0.04	2.40 ± 0.13	0.10 ± 0.07	5.34 ± 0.14	3.64 ± 1.22	4.88 ± 0.05	5	12.17 ± 1.24
HZZ450	0.10 ± 0.05	0.20 ± 0.03	1.69 ± 0.11	0.01 ± 0.01	4.14 ± 0.12	2.58 ± 1.06	3.70 ± 0.04	5	8.72 ± 1.08
HZZ500	0.03 ± 0.03	0.06 ± 0.02	1.16 ± 0.09	0.01 ± 0.01	3.25 ± 0.11	0.92 ± 0.66	1.79 ± 0.02	3	5.43 ± 0.67
HZZ550	0.00 ± 0.00	0.02 ± 0.01	0.85 ± 0.08	0.01 ± 0.01	2.56 ± 0.10	0.92 ± 0.66	1.38 ± 0.01	4	4.38 ± 0.67
HZZ600	0.00 ± 0.00	0.01 ± 0.01	0.59 ± 0.06	0.01 ± 0.01	2.05 ± 0.09	0.92 ± 0.66	0.88 ± 0.01	4	3.59 ± 0.66

	tW	ttbar	WZ	WW	ZZ	ZJets (MC)	Signal	DATA	BG
HZZ250	2.02 ± 0.21	7.03 ± 0.16	6.78 ± 0.21	6.05 ± 0.53	9.76 ± 0.17	4.00 ± 0.66	4.43 ± 0.07	40	35.64 ± 0.93
HZZ300	0.89 ± 0.14	3.75 ± 0.12	4.73 ± 0.18	1.83 ± 0.30	7.98 ± 0.16	1.91 ± 0.47	4.96 ± 0.06	19	21.10 ± 0.63
HZZ350	0.36 ± 0.09	1.46 ± 0.07	3.21 ± 0.15	0.49 ± 0.16	6.69 ± 0.15	1.95 ± 0.51	6.13 ± 0.07	13	14.16 ± 0.58
HZZ400	0.17 ± 0.06	0.52 ± 0.04	2.40 ± 0.13	0.10 ± 0.07	5.34 ± 0.14	2.08 ± 0.50	4.88 ± 0.05	5	10.61 ± 0.55
HZZ450	0.10 ± 0.05	0.20 ± 0.03	1.69 ± 0.11	0.01 ± 0.01	4.14 ± 0.12	1.17 ± 0.37	3.70 ± 0.04	5	7.31 ± 0.41
HZZ500	0.03 ± 0.03	0.06 ± 0.02	1.16 ± 0.09	0.01 ± 0.01	3.25 ± 0.11	0.55 ± 0.24	1.79 ± 0.02	3	5.07 ± 0.28
HZZ550	0.00 ± 0.00	0.02 ± 0.01	0.85 ± 0.08	0.01 ± 0.01	2.56 ± 0.10	0.55 ± 0.24	1.38 ± 0.01	4	

	tW	ttbar	WZ	WW	ZZ	ZJets (MC)	Signal	DATA	BG
									4.01 ± 0.27
HZZ600	0.00 ± 0.00	0.01 ± 0.01	0.59 ± 0.06	0.01 ± 0.01	2.05 ± 0.09	0.28 ± 0.16	0.88 ± 0.01	4	2.94 ± 0.20

29 September

BCM1F signal transfer

Andrey and I tested the lines and determined the mapping for the ethernet connection between the BCM1F rack and the gated rack. We found that one of the ports (second from the top) in the LVNIM send module has 2 faulty channels (5 and 6). Tomorrow I will check the third port. This will require that I remove the card and set the port to send mode if it is not already.

22 September

Test tables with signal MC

	tW	ttbar	WZ	WW	ZZ	ZMuMuJets	DATA	BG
Generated	1624374	10340000	205000	211000	220000	29700000		
single lepton	31958.46	30934.61	1072.85	7530.19	312.93	2310268.35	9883487	2382077.39
HLT selection/weights	31958.46	30934.61	1072.85	7530.19	312.93	2310268.35	6158706	2382077.39
Good PV	31957.12	30933.40	1071.72	7518.43	312.46	2306661.37	6079793	2378454.50
Data quality	31957.12	30933.40	1071.72	7518.43	312.46	2306661.37	6079793	2378454.50
Cosmics rejection	31956.88	30931.83	1071.57	7517.79	312.42	2304321.90	6077699	2376112.39
Dilepton	213.98	1911.90	183.62	465.71	80.64	731131.58	663854	733987.43
Z mass	47.18	428.07	149.73	110.86	73.03	663994.73	595395	664803.60
Z p_T	41.29	374.29	119.03	76.41	59.84	138777.23	127819	139448.10
3rd lepton veto	37.92	330.52	63.70	75.74	59.56	137472.12	126314	138039.55
b-jet veto	11.32	44.81	60.35	73.52	57.73	128264.96	115776	128512.69

	tW	ttbar	WZ	WW	ZZ	ZMuMuJets	Signal	DATA	BG
M250	2.64 ± 0.25	9.19 ± 0.19	7.81 ± 0.24	6.42 ± 0.57	10.87 ± 0.20	1.40 ± 0.42	5.33 ± 0.08	34	38.34 ± 0.84
M300	1.03 ± 0.16	4.25 ± 0.13	5.23 ± 0.20	1.58 ± 0.29	8.82 ± 0.18	1.01 ± 0.33	5.81 ± 0.07	23	21.91 ± 0.55
M350	0.42 ± 0.10	1.42 ± 0.08	3.47 ± 0.16	0.37 ± 0.14	7.32 ± 0.17	1.02 ± 0.40	6.99 ± 0.07	13	14.02 ± 0.50
M400	0.20 ± 0.07	0.50 ± 0.05	2.47 ± 0.13	0.03 ± 0.02	5.75 ± 0.15	1.88 ± 0.50	5.38 ± 0.06	5	10.82 ± 0.55
M450	0.08 ± 0.04	0.17 ± 0.03	1.77 ± 0.12	0.01 ± 0.01	4.45 ± 0.14	0.74 ± 0.29	4.08 ± 0.04	5	7.21 ± 0.35
M500	0.03 ± 0.03	0.05 ± 0.01	1.16 ± 0.09	0.01 ± 0.01	3.34 ± 0.12	0.59 ± 0.25	1.97 ± 0.02	4	5.19 ± 0.30
M550	0.00 ± 0.00	0.01 ± 0.01	0.80 ± 0.08	0.01 ± 0.01	2.71 ± 0.11	0.24 ± 0.17	1.52 ± 0.02	4	3.77 ± 0.21
M600	0.00 ± 0.00	0.01 ± 0.01	0.58 ± 0.07	0.01 ± 0.01	2.16 ± 0.10	0.08 ± 0.05	0.97 ± 0.01	4	2.84 ± 0.13

21 September

Numbers for Radek

b-jet p_T > 30 GeV

	ZMuMuJets	ZZ	WZ	WW	ttbar	tW	DATA	BG
0 jet	24.57 ± 1.86	22.12 ± 0.29	14.54 ± 0.33	10.39 ± 0.73	23.17 ± 0.31	4.43 ± 0.33	110	99.22 ± 2.09
1 jet	4.16 ± 0.72	0.71 ± 0.05	0.68 ± 0.07	0.47 ± 0.15	67.28 ± 0.52	7.68 ± 0.44	82	80.97 ± 1.01
2 jet	0.09 ± 0.09	0.02 ± 0.01	0.02 ± 0.01	0.00 ± 0.00	45.48 ± 0.43	1.34 ± 0.18	58	46.95 ± 0.48
3 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	3.17 ± 0.11	0.11 ± 0.05	2	3.28 ± 0.12

b-jet p_T > 20 GeV

	ZMuMuJets	ZZ	WZ	WW	ttbar	tW	DATA	BG
0 jet	24.14 ± 1.84	22.00 ± 0.29	14.34 ± 0.32	10.10 ± 0.71	18.81 ± 0.28	3.94 ± 0.31	102	93.34 ± 2.06
1 jet	4.58 ± 0.76	0.83 ± 0.06	0.86 ± 0.08	0.76 ± 0.20	63.74 ± 0.51	7.59 ± 0.44	86	78.35 ± 1.04
2 jet	0.09 ± 0.09	0.02 ± 0.01	0.03 ± 0.01	0.01 ± 0.01	52.05 ± 0.46	1.89 ± 0.22	60	54.08 ± 0.52
3 jet	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00	4.39 ± 0.13	0.12 ± 0.05	4	4.52 ± 0.14

15 September

Run meeting

- Implemented albedo corrections for BKGD 2.

Test numbers for comparison w/ Andrey

	ZJets	ZZ	WZ	WW	ttbar	tW	DATA	Background
Generated	29500000	220000	205000	220000	10340000	795000		
Single PV + single lepton	2325924.99	312.93	1072.85	7221.45	30934.61	10106.78	9883487	2375573.62
HLT selection/weights	2325924.99	312.93	1072.85	7221.45	30934.61	10106.78	6158706	2375573.62
Good PV	2322293.57	312.46	1071.72	7210.17	30933.40	10106.38	6079793	2371927.70
Data quality	2322293.57	312.46	1071.72	7210.17	30933.40	10106.38	6068779	2371927.70
Cosmics rejection	2319938.25	312.42	1071.57	7209.56	30931.83	10106.25	6066685	2369569.87
Dilepton	735607.19	80.96	184.66	444.97	1907.18	105.08	662856	738330.03
Z mass	668003.38	73.29	150.62	107.19	426.79	23.94	594497	668785.21
Z p_T	139611.98	60.07	119.62	73.84	373.01	20.85	127624	140259.37
3rd lepton veto	138206.66	59.73	64.38	73.07	325.87	19.44	126036	138749.15
b-jet veto	128986.18	57.91	60.95	70.98	44.01	6.15	115538	129226.17
M250	5.27 ± 0.88	11.64 ± 0.21	8.45 ± 0.27	7.09 ± 0.64	9.35 ± 0.21	1.00 ± 0.17	48	42.81
M300	1.92 ± 0.50	9.19 ± 0.20	5.50 ± 0.21	2.07 ± 0.35	4.54 ± 0.14	0.42 ± 0.11	24	23.64
M350	1.97 ± 0.55	7.58 ± 0.18	3.70 ± 0.18	0.61 ± 0.20	1.65 ± 0.09	0.16 ± 0.07	14	15.69
M400	2.22 ± 0.56	5.99 ± 0.16	2.71 ± 0.15	0.09 ± 0.08	0.58 ± 0.05	0.07 ± 0.04	5	11.66
M450	1.26 ± 0.41	4.66 ± 0.15	1.95 ± 0.13	0.00 ± 0.00	0.23 ± 0.03	0.00 ± 0.00	5	8.10
M500	0.55 ± 0.24	3.62 ± 0.13	1.36 ± 0.11	0.00 ± 0.00	0.08 ± 0.02	0.00 ± 0.00	3	5.60
M550	0.55 ± 0.24	2.85 ± 0.12	1.01 ± 0.09	0.00 ± 0.00	0.03 ± 0.01	0.00 ± 0.00	4	4.45
M600	0.30 ± 0.18	2.29 ± 0.11	0.70 ± 0.08	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	4	3.30

14 September

- Preselection + MET > 70 - b-jet veto

	ZJets	ZZ	WZ	WW	ttbar	tW	DATA	BG
Generated	29500000	220000	205000	220000	10340000	795000		
Single lepton	2325924.99	312.93	1072.85	7221.45	30934.61	10106.78	9547834	2375573.62
HLT selection/weights	2325924.99	312.93	1072.85	7221.45	30934.61	10106.78	5901429	2375573.62
Good PV	2322293.57	312.46	1071.72	7210.17	30933.40	10106.38	5846314	2371927.70
Data quality	2322293.57	312.46	1071.72	7210.17	30933.40	10106.38	5834995	2371927.70
Cosmics	2319938.25	312.42	1071.57	7209.56	30931.83	10106.25	5833026	2369569.87
Dilepton	735607.19	80.96	184.66	444.97	1907.18	105.08	635413	738330.03
Z mass	668003.38	73.29	150.62	107.19	426.79	23.94	569957	668785.21
Z p_T	139611.98	60.07	119.62	73.84	373.01	20.85	122268	140259.37
3rd lepton veto	138206.66	59.73	64.38	73.07	325.87	19.44	120758	138749.15
MET	56.91	24.14	16.60	12.18	143.96	6.94	232	260.72

29 August

- With mass cuts

	ZMuMuJets	ZZ	WZ	WW	ttbar	tW	DATA	Background
Generated	29500000	220000	205000	220000	10340000	795000		
Single PV + single lepton	2320104.93 ± 510.31	312.42 ± 0.78	1071.54 ± 2.49	7051.31 ± 16.95	30852.62 ± 9.95	10104.50 ± 14.10	9883487	2369497.31 ± 510.89
HLT selection/weights	2320104.93 ± 510.31	312.42 ± 0.78	1071.54 ± 2.49	7051.31 ± 16.95	30852.62 ± 9.95	10104.50 ± 14.10	6158706	2369497.31 ± 510.89
Data quality	2306865.33 ± 508.85	311.20 ± 0.78	1068.52 ± 2.48	7022.79 ± 16.92	30847.54 ± 9.95	10103.47 ± 14.10	6136701	2356218.85 ± 509.43
Dilepton	740846.47 ± 345.31	81.69 ± 0.56	186.11 ± 1.25	438.56 ± 5.07	1941.00 ± 2.99	106.91 ± 1.74	681195	743600.74 ± 345.36
Z mass	669988.96 ± 328.36	73.64 ± 0.53	151.12 ± 1.12	106.05 ± 2.50	435.32 ± 1.41	24.34 ± 0.83	608393	670779.43 ± 328.38
Z p_T	140156.61 ± 150.18	60.34 ± 0.49	119.91 ± 1.00	72.94 ± 2.07	380.07 ± 1.32	21.20 ± 0.78	130770	140811.07 ± 150.21
3rd lepton veto	131754.34 ± 145.60	58.66 ± 0.48	63.49 ± 0.73	70.65 ± 2.04	292.33 ± 1.16	18.13 ± 0.72	122263	132257.60 ± 145.62
b-jet veto	123176.16 ± 140.77	56.99 ± 0.47	60.34 ± 0.71	68.73 ± 2.01	41.57 ± 0.44	5.75 ± 0.41	112505	123409.54 ± 140.79
M250	1.42 ± 0.48	10.75 ± 0.21	8.01 ± 0.26	5.97 ± 0.57	8.57 ± 0.20	0.85 ± 0.15	31	35.56 ± 0.86
M300	0.44 ± 0.16	8.66 ± 0.19	5.20 ± 0.21	1.33 ± 0.27	3.99 ± 0.13	0.35 ± 0.10	24	19.96 ± 0.45
M350	0.82 ± 0.36	7.15 ± 0.18	3.48 ± 0.17	0.33 ± 0.14	1.36 ± 0.08	0.11 ± 0.06	13	13.25 ± 0.47
M400	0.10 ± 0.10	3.79 ± 0.13	1.45 ± 0.11	0.00 ± 0.00	0.05 ± 0.01	0.00 ± 0.00	2	5.40 ± 0.20
M450	0.10 ± 0.10	2.89 ± 0.12	0.94 ± 0.09	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	1	3.95 ± 0.18
M500	0.10 ± 0.10	2.16 ± 0.10	0.58 ± 0.07	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	2	2.85 ± 0.16
M550	0.00 ± 0.00	1.78 ± 0.09	0.42 ± 0.06	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	2	2.20 ± 0.11
M600							2	

	ZMuMuJets	ZZ	WZ	WW	ttbar	tW	DATA	Background
	0.00 ± 0.00	1.41 ± 0.08	0.28 ± 0.05	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00		1.68 ± 0.10

26 August

- preselction numbers

	ZMuMuJets	ZZ	WZ	WW	ttbar	tW	DATA	Background
Generated	29500000	220000	205000	220000	10340000	795000		
Single PV + single lepton	2320104.93 ± 510.31	312.42 ± 0.78	1071.54 ± 2.49	7051.31 ± 16.95	30852.62 ± 9.95	10104.50 ± 14.10	9883487	2369497.31 ± 510.89
HLT selection/weights	2320104.93 ± 510.31	312.42 ± 0.78	1071.54 ± 2.49	7051.31 ± 16.95	30852.62 ± 9.95	10104.50 ± 14.10	6158706	2369497.31 ± 510.89
Data quality	2306865.33 ± 508.85	311.20 ± 0.78	1068.52 ± 2.48	7022.79 ± 16.92	30847.54 ± 9.95	10103.47 ± 14.10	6136701	2356218.85 ± 509.43
Dilepton	740846.47 ± 345.31	81.69 ± 0.56	186.11 ± 1.25	438.56 ± 5.07	1941.00 ± 2.99	106.91 ± 1.74	681195	743600.74 ± 345.36
Z mass	669988.96 ± 328.36	73.64 ± 0.53	151.12 ± 1.12	106.05 ± 2.50	435.32 ± 1.41	24.34 ± 0.83	608393	670779.43 ± 328.38
Z p_T	140156.61 ± 150.18	60.34 ± 0.49	119.91 ± 1.00	72.94 ± 2.07	380.07 ± 1.32	21.20 ± 0.78	130770	140811.07 ± 150.21
3rd lepton veto	131754.34 ± 145.60	58.66 ± 0.48	63.49 ± 0.73	70.65 ± 2.04	292.33 ± 1.16	18.13 ± 0.72	122263	132257.60 ± 145.62
b-jet veto	123176.16 ± 140.77	56.99 ± 0.47	60.34 ± 0.71	68.73 ± 2.01	41.57 ± 0.44	5.75 ± 0.41	112505	123409.54 ± 140.79

- Multiplicity for b-jets for M300 higgs

	Z+Jets	ZZ	WZ	WW	ttbar	tW	DATA	Background
0 jet	0.44 ± 0.16	8.83 ± 0.19	5.32 ± 0.21	1.47 ± 0.29	4.06 ± 0.14	0.35 ± 0.10	24	20.45 ± 0.47
1 jet	0.13 ± 0.13	0.18 ± 0.03	0.18 ± 0.04	0.11 ± 0.08	11.90 ± 0.24	0.75 ± 0.15	15	13.26 ± 0.32
2 jet	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.01	0.00 ± 0.00	8.48 ± 0.20	0.14 ± 0.07	8	8.64 ± 0.21
3 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.51 ± 0.05	0.04 ± 0.03	1	0.55 ± 0.05

25 August

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Background
0 jet	0.06 ± 0.06	0.37 ± 0.02	0.35 ± 0.03	0.16 ± 0.06	0.29 ± 0.02	0.04 ± 0.02	1.27 ± 0.09
1 jet	0.00 ± 0.00	0.01 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	0.76 ± 0.03	0.05 ± 0.02	0.83 ± 0.04
2 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.66 ± 0.03	0.00 ± 0.00	0.66 ± 0.03
3 jet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.01	0.00 ± 0.00	0.03 ± 0.01

24 August

Just a test...

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Signal	Data	Background
Generated	29500000	220000	205000	220000	10340000	795000	96990		
Single PV + single lepton	2290731.00 ± 1513.52	18659.00 ± 136.60	21083.00 ± 145.20	19604.00 ± 140.01	1111636.00 ± 1054.34	59888.00 ± 244.72	10329.00 ± 101.63	169186	0.
HLT selection/weights	828189.00 ± 910.05	3950.00 ± 62.85	4040.00 ± 63.56	1393.00 ± 37.32	79862.00 ± 282.60	719.00 ± 26.81	2830.00 ± 53.20	18306	31309607.
Data quality	748913.00 ± 865.40	3551.00 ± 59.59	3319.00 ± 57.61	349.00 ± 18.68	17736.00 ± 133.18	166.00 ± 12.88	2622.00 ± 51.21	16350	31309607.
Dilepton	156366.00 ± 395.43	2870.00 ± 53.57	2637.00 ± 51.35	250.00 ± 15.81	15483.00 ± 124.43	150.00 ± 12.25	2558.00 ± 50.58	3522	3521601.
Z mass	155164.00 ± 393.91	2855.00 ± 53.43	1570.00 ± 39.62	249.00 ± 15.78	14207.00 ± 119.19	145.00 ± 12.04	2531.00 ± 50.31	3486	918153.
Z p_T	155164.00 ± 393.91	2855.00 ± 53.43	1570.00 ± 39.62	249.00 ± 15.78	14207.00 ± 119.19	145.00 ± 12.04	2531.00 ± 50.31	3486	774034.
3rd lepton veto	134652.00 ± 366.95	2784.00 ± 52.76	1482.00 ± 38.50	242.00 ± 15.56	12343.00 ± 111.10	133.00 ± 11.53	2382.00 ± 48.81	3083	177756.
b-jet veto	6.00 ± 2.45	652.00 ± 25.53	201.00 ± 14.18	18.00 ± 4.24	3597.00 ± 59.97	32.00 ± 5.66	1722.00 ± 41.50	3	174190.
Δ (MET, jet)	1.00 ± 1.00	388.00 ± 19.70	126.00 ± 11.22	8.00 ± 2.83	1075.00 ± 32.79	9.00 ± 3.00	1543.00 ± 39.28	0	174190.
MET	1.00 ± 1.00	388.00 ± 19.70	126.00 ± 11.22	8.00 ± 2.83	1075.00 ± 32.79	9.00 ± 3.00	1543.00 ± 39.28	0	151636.
Final (raw)	1	388	126	8	1075	9	1543	0	

17 August

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Signal	Data	Background
Single PV + single lepton	1273705.61	171.80	589.19	3964.91	16996.50	5552.97	30.42	7954347	1300981.0
HLT selection/weights	1273705.61	171.80	589.19	3964.91	16996.50	5552.97	30.42	4283530	1300981.0
Data quality	1267464.49	171.27	587.80	3951.68	16993.73	5552.44	30.42	4276240	1294721.4
Dilepton	408159.32	44.95	102.41	246.53	1068.63	58.76	7.36	446227	409680.6
Z mass	369161.17	40.53	83.17	59.53	239.75	13.37	6.87	398618	369597.5
3rd lepton veto	368313.42	40.38	47.87	59.25	212.22	12.49	6.80	397479	368685.6
b-jet veto	368313.42	40.38	47.87	59.25	212.22	12.49	6.80	397479	368685.6
Z p_T	76339.86	33.09	37.73	40.75	185.34	10.89	6.64	84616	76647.7
Δ (MET, jet)	68056.65	32.15	35.39	39.70	160.01	9.87	6.19	74681	68333.8
MET	1.88	9.03	5.36	2.38	49.31	2.30	4.46	86	70.3
MT	0.49	5.00	3.18	0.90	15.42	0.78	3.85	35	25.8

12 August

Changes to talk

- Underline name in title page (DONE)
- only my name in footer (uh...pretty much)
- specify which cuts are affected by our changes selection slides (uh...pretty much)
- add jet-vertex association for b-jets (uh...)
- remove unchanged parameters from 3rd lepton veto slide (DONE)
- include slide before PU with changes to yields for each change; add S/B (DONE)
- add muon isolation slide; point is, too sensitive to PU. (DONE)
- add nJet < 2 cut for final cut (uh...)

11 August

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Signal	Data	Background
μμ	0.63	4.99	3.22	1.14	3.00	0.34	3.74	13	13.3
ee	0.23	3.87	2.65	0.87	2.18	0.15	3.01	19	10.0

9 August

```
| Two oppositely charged leptons:    |  22693   |24220.4        |
| Z mass window:                     |  20968   |22380.5        |
| Third lepton veto:                 |  20739   |22136.5        |
| b-jet veto:                        |  18842   |20049.1        |
| Z Qt :                             |  18618   |19807.6        |
| deltaPhi(MET, jet):                |  18618   |19807.6        |
| MT:                                |  14339   |15260.7        |
| MET:                               |  13480   |14358.4        |
```

Friday update

- reproduce EPS results with 300 GeV Higgs

Changes

- lower threshold on b-jets
- tighter third lepton vetor
- jet-vertex association
- change to muon isolation
- electron endcap H/E
- MET corrections for PU

ntuples

For next ntuple production...

Data

For each dataset there are three periods: May 10th rereco, prompt v4, and the Aug 5th rereco. We may also include prompt v6.

- DoubleMu (*)
- DoubleElectron (*)
- MuEG
- Photon

MC

- DYtoMuMu (*)
- DYtoEE (*)
- DYtoTauTau
- TTTo2L2Nu (*)
- tW
- ZZ (to anything or just 2L2Nu?) (*)
- WW (*)
- WZ (*)
- W+Jets

Signal

For the signal we have 3 types of samples (ZZ*, VBFZZ, and WW) and 8 mass bins (140*, 200*, 250, 300*, 350, 400*, 450, 500, 550, 600). These need to be run over the grid.

3 August

Test yields for M=300 Higgs

MUONS

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Signal	Data	Back
Generated	29500000	220000	205000	220000	10340000	795000	96990	--	4
Ntuple	20653393.00	161732.00	185585.00	177114.00	9631195.00	513701.00	84130.00	7954347	313
HLT selection/weights	1323652.61	126.04	589.19	3964.91	16996.50	7451.27	18.56	4277626	13
data quality bits	1322626.36	131.41	628.02	4162.60	17656.30	7773.52	19.49	4276240	13
Dilepton	514641.44	27.85	119.41	291.01	1264.69	91.92	5.27	446119	5
Z mass	440521.28	25.14	96.95	69.45	284.27	20.81	4.91	398565	4
3rd lepton veto	424153.34	24.45	65.00	67.26	205.18	17.39	4.60	390175	4
b-jet veto	417632.82	24.20	63.74	66.73	54.61	8.04	4.48	382104	4
Z p_T	64527.93	14.39	36.25	29.21	38.58	5.90	4.21	72838	
Δ (MET, jet)	57160.75	14.39	36.25	29.21	38.58	5.90	4.21	62897	
MT	6708.60	3.40	6.83	2.04	6.44	0.77	3.10	247	
MET	2.82	2.86	4.72	1.31	4.52	0.47	2.68	10	
MET/QT	2.82	2.86	4.72	1.31	4.52	0.47	2.68	10	
MET + QT	2.82	2.86	4.72	1.31	4.52	0.47	2.68	10	
nJets < 2	2.69	2.56	3.75	1.16	1.02	0.16	1.91	3	

Comparing to the EPS selection

Muon selection

CUT DESCRIPTION	May10	Prompt
Initial number of events:	2878369	5075978
Pass HLT selection:	957013	3326517
Cosmics veto:	955777	3321849
Two oppositely charged leptons:	92949	536503
Z mass window:	61761	373238
lepton pt cut :	56372	341701
b-jet veto:	55406	335918
Z Qt :	11178	68005
deltaPhi(MET, jet):	10341	63068
MT:	50	252
MET:	2	11

CUT DESCRIPTION	May10	Prompt
Initial number of events:	7001065	16172294
Pass HLT selection:	1785871	8294984
Cosmics veto:	1785310	8292508
Two oppositely charged leptons:	64449	301050
Z mass window:	53376	249979
lepton pt cut :	50315	235409
b-jet veto:	49423	231450
Z Qt :	10222	47737
deltaPhi(MET, jet):	9478	44110
MT:	47	249
MET:	3	17

1 August

Some test yields

Trying to recreate the results for the 300 GeV Higgs.

	Z+Jets	ZZ	WZ	WW	ttbar	tW	Signal (M=200 GeV)	Data (DoubleMu)	Background
Initial	1225733.976	802.779	336.140	2549.545	16132.754	7451.271	55.711	7954347	1253006.5
HLT selection	1225733.976	802.779	336.140	2549.545	16132.754	7451.271	55.711	4301175	1253006.5
data quality bits	1281581.022	836.992	358.290	2676.665	16759.023	7773.519	59.170	4294302	1309985.5
Dilepton	461733.431	177.385	68.125	187.128	1200.419	91.917	15.249	443289	463458.4
Z mass	417631.602	160.159	55.309	44.659	269.821	20.811	14.525	395688	418182.4
3rd lepton veto (> 10 GeV)	410220.868	155.722	37.083	43.248	194.749	17.395	13.815	387675	410669.1
b-jet veto (> 20 GeV)	406970.796	154.166	36.365	42.907	51.833	8.037	13.521	384006	407264.1
Z p_T (> 25 GeV)	406970.796	154.166	36.365	42.907	51.833	8.037	13.521	384006	407264.1
Δ (MET, jet)	406970.796	154.166	36.365	42.907	51.833	8.037	13.521	384006	407264.1
MT > 0 GeV	406970.796	154.166	36.365	42.907	51.833	8.037	13.521	384006	407264.1
MET	406970.796	154.166	36.365	42.907	51.833	8.037	13.521	384006	407264.1
MET/QT	406970.010	154.166	36.365	42.907	51.833	8.037	13.521	384005	407263.3
MET + QT	406970.010	154.166	36.365	42.907	51.833	8.037	13.521	384005	407263.3
nJets < 2	406970.010	154.166	36.365	42.907	51.833	8.037	13.521	384005	407263.3

Analysis code instructions

To run the analysis code check out the code along with the necessary libraries,

```
cvs co UserCode/NatesAnalyzer
cd UserCode/NatesAnalyzer/HiggsAnalyzer
```

In this directory are several scripts which, depending on how you run, perform different functions. The core of the package is the higgsAnalyzer.C and higgsAnalyzer.h. Various parameters can be specified (trigger selection, lepton selection, analysis cuts, etc.) at the top of higgsAnalyzer.C. The two main selection choices are "electron" and "muon" (there are photon selections under development).

Now you need to specify a dataset to run over. If you are running on lpc, it should run out of the box; otherwise, you must specify the root file you want to run over in runLocal.C. This should be done with

```
fChain->Add(
```

Once this is done, just type the command,

```
root -l runLocal.C
```

Altenatively, you can run using the higgsLocal.csh script. In this case you are using the higgsAnalyzer_Template.C file as the body of the code and the datasets are specified in a text file in the sourceFiles directory. To run,

```
./higgsLocal.csh SUFFIX TRIGGERS DATASET SELECTION
```

Basically, you are now specifying some of the more important parameters that were specified in the code in the command line. The dataset field should contain the name of the text file that lists the paths to the datasets. For running over many datasets at once there is a script that will submit multiple jobs to the lpc batch system. This is done with the multiBatch.csh script,

```
./multiBatch.csh BATCHCONFIG
```

The one field you specify should let the script know about a text file that has a list of the arguments you would give to the higgsLocal.csh script.

25 July

Using the higgs analyzer on lxplus

Log in to lxplus and then, if it is available, go to your scratch area. We need to set up a release of CMSSW

```
cd scratch0
cmsrel CMSSW_4_2_4
cd CMSSW_4_2_4/src
cmsenv
```

The checkout the necessary code from CVS,

```
cvs co -r V00-00-01 /UserCode/NatesAnalyzer/HiggsAnalyzer
cvs co /UserCode/NatesAnalyzer/src
cd /UserCode/NatesAnalyzer/HiggsAnalyzer
```

The important files here are higgsAnalyzer.C, higgsAnalyzer.h, and runLocal.C. In the analyzer, you make plots, apply selections, and do any calculations that need to be done. You specify what dataset you want to run over in runLocal.C. The path of the dataset is saved in a text file in the sourceFiles directory. For now, it points to a file called TEST.txt which gives the path to data from the double muon stream stored in my castor space. This file can be copied from my local space on lxplus, ~naodell/public/TEST.txt. Make sure it is place in the sourceFiles directory. Finally, to run, just enter

```
root -l runLocal.C
```

19 July

Draft of ntuple production instructions

From lpc

```
cmsrel CMSSW_4_2_4
cd CMSSW_4_2_4/src

cvs co -d Higgs/ntupleProducer UserCode/NWU/ntupleProducer
cvs co -r V110523_BE -d DataFormats/AnomalousEcalDataFormats UserCode/csander/DataForma
cvs co -r V110523_BE -d PhysicsTools/EcalAnomalousEventFilter UserCode/csander/PhysicsT
cvs co -r V110523_BE -d Sandbox UserCode/csander/Sandbox
cvs co -r V19MAY2011_v3 JetMETAnalysis/ecalDeadCellTools
cvs co -r V04-04-04 JetMETCorrections/Type1MET

scram b

cd Higgs/ntupleProducer/test
cmsenv
crabenv
```

Then modify crabNtuples_*.cfg (Data or MC depending on the sample) to your liking. By default it will save to dcache (which I think is preferable), but save it wherever you want. The config file (ntupleProducer_cfg.py) also needs to be modified depending on whether you are running over MC or data. It should be sufficient to change the tag name.

15 July

Questions for HWW lepton fake team

- The fake rates are calculated using a combination of data from the Jet and Photon streams. What is the relative contribution from each stream? I see that the vast majority of events come from the Photon stream.

- How do you calculate the fake rate from the W+Jets sample? Do you do it by MC truth matching or do you use the same method as for the data, but exclude the electron coming from the W? If it is the former, do you consider a fake to be a reconstructed electron not coming from a W or Z?

-

7 July

Acceptances from HZZ analysis

The order of Andrey's cuts are:

- some preselection
- $76 < M_{ll} < 106$
- cut on $p_{T,l1}$ and $p_{T,l2}$
- veto on b-jets
- cut on MET

The details of the preselection need to be clarified, but it should apply some standard event quality cuts plus a requirement that the two leptons pass ID, isolation, p_T, and eta cuts.

Dataset	number of events passing μ (e)	% of events μ (e)
ttbar	17541 (11974)	2 (1)
DY->ll	461527 (302982)	75 (53)
ggH200	22501 (15610)	40 (28)

19 June

Lepton fakes

To do

- Determine lead jet p_T cut: this needs to be applied to improve agreement between the p_T spectrum in the calibration sample and W+jets MC. It also allows for the determination of the associated systematic uncertainty.

- Get the fake rates from the calibration samples (Photon and Jet streams combined) and MC samples (W+jets and QCD).

13 June

BRM

Remote connection to access DIP cernts.cern.ch --> cerntscms01.

Fake studies

This is going to be somewhat useful for both the VBF analysis and the H->ZZ->llnunu analyses. First step in setting up the analysis is to measure the fake rates parameterized by p_T and (and maybe). This I could do now with the PromptReco jet triggered sample. At first I'll have to do this without a trigger selection since I'm not quite sure which one to choose. Prescales probably won't matter, but I will want to maximize the number of objects.

10 June

BCM1F

Some rough calibration factors, shifting everything to 60 ns

Channel	pilot peak	
1/1	60.5	-0.05
1/2	62.1	-2.1
1/3	51.35	+8.65
1/4	54.25	+5.75
2/1	60.3	-0.3
2/2	62.0	-2.0
2/3	54.9	+5.1
2/4	54.1	+5.9

7 June

BCM1F

Some results from the TDC tests. We ran a pulse generator directly into the fan in/fan out in with varying parameters to try to isolate the source of the noise observered in channels 1/2, 1/3, 2/2, and 2/3. I put the relevant links here on the calibration twiki, https://twiki.cern.ch/twiki/bin/view/Main/BCM1FCalibrationStudies.

VBF lepton fakes

I hope this is still useful. I've made a ntuple producer just for the fakes. I don't save jets in it for now which might be a problem if I need to include a VBF selection or want to parameterize the fake rate in terms of so jet quantities. For now I save the 4-momentum of the tracks for the electron and muon denominators. The basic procedure is outlined in AN-2009/120. For the case of the electrons, I match gsfTracks to super clusters and then apply some loose cuts. What I need to determine is if I will need some extra information in the case that I later want to apply cuts for electron ID and isolation. This goes for the loosest denominator for the muons which is just an isolated track (the other two are muon objects so I just save them as I would any muon). By the end of today I should produce some ntuples and get some basic numbers.

1 June

BCM1F

To access the 30 minute BMC1F bunch data log onto brmbcmctrl3, and they are located in /d1/brmpro/data/Transfer/cache. Yay!

30 May

BCM1F

I'm going to need to determine the correct offset factors for each channel. The best way to determine this (I think) will be to look at non-colliding bunches, fit a gaussian, and compare the mean of the fit to the center of the bunch. Just from eyeing the centroid of the first colliding bunch for Fill 1815 I would say the offsets are approximately,

Channel	Offset
11	-8
12	+5
13	-4
14	-1
21	-7
22	-3
23	-2
24	+6

27 May

BCM1F

Apparently the BCM1F has not been set correctly for the past year or so, so we are now analyzing the effect of changing the high voltage. I made a twiki, **HERE!**. From Anne:

```
1) non-colliding bunch associated to beam 1
2) non-colliding where associated to beam 2
3) the pilot
4) a normal colliding bunch.

We need to have these samples for:
100 V old thresholds
250 V old thresholds (the sample you are using is fine)
250 V thresholds of last night
```

Right now, in the twiki, there are fits for colliding bunches at 250V with the old thresholds. So I will need to do 12 sets of fits, where in the case of colliding bunches I have to also do a series of double Gaussian fits.

25 May

Back to the grind after three weeks of nonsense and travelling. I need to get my thoughts together on what to do now. Some things,

- I'm meeting with Anne later in the afternoon; she already gave an outline of what should be done in an email, but we'll likely work out what the deal is going to be with shifts.
- For the VBF stuff I have two things I should be looking at: (1) make overlays of some of the standard distributions I've been looking at, and (2) start getting the objects to look at the fakes.
- triggers: catch up on this shit... I had a couple of items that were requested, but that was so long ago that I'm not quite sure if they still need to be done...

18 May

Candidacy passed!

triggers

A lot to do here...

From Michal:

```
make new evaluation of e+tau trigger rates
as a function of el and tau pT with following conditions:
   1. Electron as it is (CalIdVT_CalIsoT_TrkIdT_TrkIsoT), while tau with
tightIso instead of looseIso
   2. Electron identified as current one
(CalIdVT_CalIsoT_TrkIdT_TrkIsoT), but with |eta|
```

From Artur:

```
   * can you send me updated plot  of the rate vs cut (tau Et, mu Pt w/o
mu isolation) for 1E33?
 (page 22 of attached pdf)

   * can you check the rate table, and fill the missing numbers?
 (page 23 of attached pdf)
```

From Simone:

```
Nate, could you provide rate numbers for 2E33 for the following triggers:

HLT_Ele18(with usual EleID and Isolation)_LooseIsoTau20
HLT_Ele18(with usual EleID and Isolation)_TightIsoTau20
```

Trigger name	L1 seed	Prescale	Rate(Hz)
Electon			
OpenHLT_Ele18_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_LooseIsoPFTau20	L1_SingleEG12	1	6.2 +- 0.04
OpenHLT_Ele18_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_TightIsoPFTau20	L1_SingleEG12	1	4.2 +- 0.04

1 May

Higgs

After speaking with Pietro, we decided I would look at fake rates for central objects in the VBF topology. I guess we have determined that the QCD BG will be well modelled based on what I showed before. Now we want to look at central leptons (e and μ). This will likely rely on a data-driven technique that makes use of 'fakeable' objects; in the case of electrons these will be (gsf)tracks associated to superclusters. So I will need to add the latter two things to my ntuple to carry out the study. For muons I may need some extra information from the muon chambers. For reference,

29 April

trigger update

For the meeting today:

- Some plots showing the rate dependence on and/or &muon; p
- Show table with changes to rates from Josh's modifications with current numbers.

Trigger name	L1 seed	Prescale	New changes (1e33)	1e
Electon				
OpenHLT_Ele15_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_LooseIsoPFTau15	L1_SingleEG12	1	11.9 ± 0.1	10. &p 0.1
OpenHLT_Ele15_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_LooseIsoPFTau20	L1_SingleEG12	1	7.71 ± 0.05	6.6 &p 0.1
OpenHLT_Ele18_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_LooseIsoPFTau15	L1_SingleEG15	1	9.23 ± 0.05	---
OpenHLT_Ele18_CaloIdVT_TrkIdT_CaloIsoT_TrkIsoT_LooseIsoPFTau20	L1_SingleEG15	1	6.2 ± 0.04	---
Mu				
OpenHLT_IsoMu12_LooseIsoPFTau10	L1_SingleMu10	1	10.85 ± 0.07	7.2 &p 0.1
OpenHLT_IsoMu12_LooseIsoPFTau15	L1_SingleMu10	1	5.98 ± 0.06	---
OpenHLT_IsoMu15_LooseIsoPFTau15	L1_SingleMu10	1	3.13 ± 0.04	---
OpenHLT_Mu15_LooseIsoPFTau20	L1_SingleMu10	1	13.68 ± 0.08	15. &p 0.1

19 April

DPS

I think I've taken care of the b-tag issue. There were at least two bugs in the filling of the b-tag discriminator. First, Steve used a box cut to associate jets using b-tags to the PFJets. For the Δ cut he didn't take the absolute value so that the comparison could conceivably have allowed an association between jets thought their Δ separation was large. This was unlikely to happen, though, because the Δ cut was so tight (< 0.005).

The bigger problem is that the b-tags were made using some CaloJet collection (or possibly some jet collection using a different clustering algorithm) so that jet axis was sometimes rather far apart and jets were not being associated to the b-tag seed value. This meant certain jets were not given any value for the b-tag whereas they should all be given some value. This could have been addressed by loosening the dR of the jet association so that the b-tag jet lied within the cone of the PFJet. This still could have problems; instead I changed the collection that is used to generate the b-tags to the collection I save in my ntuples (ak5PF jets) and check that dR == 0. This seems to work; just need to check the results.

8 April

DPS

I changed the ordering of the if statement to fill the jet containers (b-tag/no-tag) and included a requirement that no-tag jets have a discriminator value less than 0.

ptHat	N_{Init} (10^6)	$N_{final,b\text{-}tag}$	$N_{final,noTag}$(10^3)	Normalization (nb^{-1})
[15,30]	--	--	0.01	6.68
[30,50]	3.26	36	15.3	61.37
[50,80]	3.19	1142	158	501.8
[80, 120]	3.2	6415	428	4090.3
[120,170]	2.74	13929	572	26499

trigger

Looks like the dz variables are a go. Some distributions without any cuts on the **twiki** .

7 April

DPS

May have fixed it

6 April

DPS

The issue with the b-tag ptHat distribution needs to be addressed. Before and after selection of events with b-tagging on and off,

I'm working under the assumption that I have a bug and it probably comes from when I fill the b-jet container. Possibly I am overcounting bjets...

ptHat	N_{Init} (10^6)	$N_{final,b\text{-}tag}$	$N_{final,noTag}$$(10^3)$	Normalization (nb^{-1})
[15,30]	--	--	0.01	6.68
[30,50]	3.26	19	15.3	61.37
[50,80]	3.19	1545	158	501.8
[80, 120]	3.2	13229	428	4090.3
[120,170]	2.74	36118	572	26499

3 April

Weekend trigger shifts cancelled! I need to get my to-do in order here now that this nonsense is out of the way.

BRM

Meeting with Anne & co. on Monday to discuss what I have so far and how to proceed. Previous entry has where things currently stand...

Training to become a BRM expert will begin this week as well.

trigger

I'll check the vertex z distributions for taus, leptons, and vertices tonight. Then right a simple analyzer that makes Δz distributions. Should have something tomorrow or Tuesday so I can begin calculating the effect on the rates and PU enhancement.

DPS

A couple things here,

- More MC! I'll run for 2 million events with ptHat 15/10.
-

30 March

Trigger training shift...

BRM

See the **twiki**. At the bottom is the to-do...

The first thing I should figure out is how to get a file that has the bunch-by-bunch intensities. It basically just needs two columns, one for each beam. I think the distinction between colliding, non-colliding, ghost/parasitic, and empty could be done simply by checking the intensity and whether both beams are filled. So for one, I need to find a source of such a file; kind of like **this**, but in a format that is easily read by a script, like a txt file. Then once I have this, I identify the bunch types and store this in an array. Then as I loop over the data I look up the status of the bunch each time I have hit. Once this is done, I fill the relevant histogram. Simple enough.

In the case of non-colliding bunches, I'll take the surrounding (+-1) bunches and include them in the rate (for now). Also, I will need to subtract off the pedestal. To do this, I subtract off the average of the sum of bunches [-2,-4] and [2,4].

28 March

BRM

Since I have to give an update on what I've done for the BCM1F discriminator (uhh...well...), I need to make something today. Currently I can get the rates, the bunch structure plots, and some miscellaneous other stuff. This should, more or less, be sufficient for what Nicola asked for. Because I have only one day to prepare something for the meeting now, I think the simplest thing to do is look at the rate for colliding and non-colliding bunches, compare the rates to each other and compare them to the bunch scheme available on cmswbm.

27 March

DPS

So...I developed a jet-parton association scheme starting about a week or so ago. The first attempt was not quite successful. In that case I did the following:

- Get genParticles associated to jet.
- From HepMC::GenEvent get particles (partons) that are the products of the hardest scattering (status = 23).
- Trace ancestors/descendents of both collections to status = 71 particles.
- Look for overlap.

The problem with this approach is that there is a huge amount of overlap and doing something simple, like the fraction of matched from one parton to the total matched, doesn't really help. So after trying the complicated thing, I am now going to use a simple dR association (with a possible dp_T selection as well). Just from looking at the printouts, this looks very promisiing. So the first step is make some histograms,

- dR between jet and nearest parton
- dR between jet and second nearest parton
- dp_T between jet and nearest parton
- number of matched jets (identify parton), not matched, multiple matches. Do this with a tight cut (dR < 0.5), something a bit looser (dR < 0.8 of 0.9) and just taking the nearest.

Some of the plots are **here**.

18 March

trigger

There was a bug in the oHLT ntuple code (something with track seeding from the pixels) so I am recalculating the rates for the usual trigger paths as well as the PU enhancement factors. Michal Bluj also requested that I look at the effect of lowering the threshold for the CaloId on the electron x-triggers.

DPS

Because we have been plagued by useless fit results, I decided we would need to clean up our signal sample so that it is in fact a signal sample. This requires that the jets which are paired to produce our DV distributions are 'tagged' so that we can say that they actually come from seperate hard scatterings. Digging around in the MC information has revealed that this is no trivial task. Roughly, what I do, or plan to do, is 1) associate recoJets to genJets, 2) retrieve collection of genParticles used to construct genJet, 3) ?.

10 March

So much for being 'daily'. Anyway, I'll summarize what I've done over the last couple of days.

DPS

A couple days ago I made a number of fits using our isolated dijet scheme, **here**. S_{min} and ΔS seem consistent, but the other two are certainly not. I would explect, though, that S_{min} and S_{pT} would agree because they are basically the same, and S_{phi} and ΔS would be closer to agreeing because they both measure angular correlations. Realizing that this fitting method is sensitive to low statistics, I restricted the ranges to only include non-zero bin ranges. The result is **here**. The only DV that changes is S_{min}; it agrees quite well with S_{pT} now as I anticipated. The reason for this is likely due to the difficulty when the bin 9-9.5 and (maybe) 6.5-7 are included.

The issue is that the fitting method is obviously sensitive to the fitting range in a somewhat unpredictable way as can be seen **here**. What I have done here is restrict the bin range to [1-9], [1-8], [1-7], and [1-6], respectively. The results are definitely sensitive to the selected fit range and are quite unstable. The binning used is also going to be somewhat of a concern. I am repeating this in a more systematic way.

Assuming this effect arises due to sensitivity to statistics, I consider our modified standard selection (lower p_T on jets 3 and 4) which has a much higher event yield. Here are the fit results using the entire range for each,

DV	$p_{T,3} + p_{T,4}$	DPS forced	Pythia8 QCD	$Chi^2/nDOF$	Probablility
SMin	20	0.683315 +/- 0.0453319	0.316677 +/- 0.0452781	1.14289	0.301551
	30	0.236942 +/- 0.0684679	0.763077 +/- 0.0695081	1.23038	0.225534
	40	0.257489 +/- 0.0928911	0.742523 +/- 0.0942959	0.558875	0.929939
	50	0.0677737 +/- 0.190128	0.9324 +/- 0.192548	0.598892	0.903456
deltaS	20	-0.0511974 +/- 0.0419507	1.05119 +/- 0.0447697	0.44778	0.969959
	30	-0.107051 +/- 0.0454348	1.10705 +/- 0.049374	0.254022	0.998788
	40	-0.148065 +/- 0.0636131	1.14806 +/- 0.0692001	0.241436	0.999119
	50	-0.244766 +/- 0.102777	1.24488 +/- 0.111892	0.219256	0.999525
Spt	20	0.0244053 +/- 0.0460903	0.975627 +/- 0.0465043	1.93703	0.000467081
	30	0.130362 +/- 0.0477762	0.869618 +/- 0.0487975	0.932268	0.589078
	40	0.179387 +/- 0.0945634	0.820804 +/- 0.0948816	0.570859	0.984436
	50	0.102581 +/- 0.104497	0.897379 +/- 0.106065	0.386395	0.999766
Sphi	20	0.274443 +/- 0.0376487	0.725558 +/- 0.0378575	0.949458	0.551997
	30	0.186563 +/- 0.0480685	0.813483 +/- 0.0483528	0.753585	0.848784
	40	0.181946 +/- 0.134658	0.817969 +/- 0.135743	0.447943	0.997716
	50	-0.169413 +/- 0.162867	1.16949 +/- 0.162076	0.378076	0.99962

3 March

DPS

Now I add the topology selection and get the following yield,

Initial number of events:	801803
Pass HLT selection	754542
One and only one primary vertex:	552959
Vertex displacement in z < cm:	552746
Vertex ndof >= 4:	552415
abs( ) < 2.4 :	323067
Miscellaneous jet quality cuts:	313393
p_{T,1/2} > 20 GeV and p_{T,3/4} > 10:	43176
p_{T,1} + p_{T,2} > 75 GeV:	15712
isolated dijets	313

If I make no restriction on the run range, this becomes

Initial number of events:	7814238
Pass HLT selection	2197572
One and only one primary vertex:	1122399
Vertex displacement in z < cm:	1121557
Vertex ndof >= 4:	1120807
abs( ) < 2.4 :	657983
Miscellaneous jet quality cuts:	638001
p_{T,1/2} > 20 GeV and p_{T,3/4} > 10:	87281
p_{T,1} + p_{T,2} > 75 GeV:	31744
isolated dijets	627

2 March

DPS

Testing out JetMETTau for Run2010A (runNumber < 137028) with residual corrections and extending range. Without residual corrections the event yield is,

Initial number of events:	801803
Pass HLT selection	754542
One and only one primary vertex:	552959
Vertex displacement in z < cm:	552746
Vertex ndof >= 4:	552415
abs( ) < 2.4 :	323067
Miscellaneous jet quality cuts:	313393
p_{T,1/2} > 20 GeV and p_{T,3/4} > 20:	3906
p_{T,1} + p_{T,2} > 75 GeV:	2644

If I lower the p_T threshold on the jets in the second pair I get

p_{T,1/2} > 20 GeV and p_{T,3/4} > 10:	43176
p_{T,1} + p_{T,2} > 75 GeV:	15712

I discovered that the residual corrections are being stored incorrectly; I was applying the L2 and L3 corrections a second time while retrieving the residual corrections. This will have to be corrected in the next round of ntuples.

1 March

HCAL Conditions

From Anton:

```
Tag: HcalRespCorrs_v3.10_offline,
use the etaPhiCorr_030111 files.
IOV:
"period1" -> 1-148655
"period2" -> 148656...eot

"Both phi and eta-dependent scale corrections are included. The phi
corrections are identical to v2.10 and scale corrections are derived on top
them. The effect of cluster contamination is not accounted for yet.
The IOV separation is to account for hardware changes in HF (see comments
for v2.01)."


Similarly, make
Tag: HcalRespCorrs_v2.10_offline,
use the phiCorr_030111 files.
IOV:
"period1" -> 1-148655
"period2" -> 148656...eot

"Only phi corrections are included. The phi corrections in HBM
(ieta=[-1,-15], iphi=6), (ieta=[-1,-7], iphi=32) are set to 1.
Channels HB(-1,36), HB(-5,36), HB(-9,36) are adjusted down relative to v2.01
to correct for behavior seen in Dec re-reco.
The IOV separation is to account for hardware changes in HF (see comments
for v2.01)."
```

Done and done.

DPS

We tentatively had decided to switch to running over MinBias stream data from the Nov 4th ReReco. Initially it looked as though we might have had a sufficiently large number of events to proceed, but once you include the HLT selection HLT_L1_BscMinBiasOR_BptxPlusORMinus the event yield is negligible,

Initial number of events:	14552305
Pass HLT selection	1489011
One and only one primary vertex:	627543
Vertex displacement in z < cm:	627078
Vertex ndof >= 4:	626643
abs( ) < 2.4 :	132112
Miscellaneous jet quality cuts:	127465
p_{T,1/2} > 20 GeV and p_{T,3/4} > 10:	1514
p_{T,1} + p_{T,2} > 75 GeV:	344

On the other hand if you run without the trigger selection, you get a high event yield, but funky distributions, **[[][here]]**. Radek is looking into what triggers have all of these events, but it probably will just make this more complicated. So, back to comissioning and Jet(MET(Tau)) data. We want to increase our statistics so I am going to look at using an alternative trigger which does not become prescaled as quickly as the Jet_15U trigger.

23 Feb

HCAL conditions

Anton sent a request for me to load test tags for three new types of conditions objects: RecoParams, LongRecoParams, and MCParams. They need to be run in CMSSW_4_2_0_pre5 (instructions for setting up the environment are **here**. There are a couple extra packages that need to be checked out on top of the release,

```
cvs co -r V03-07-01 CondFormats/HcalObjects
cvs co -r V06-14-13 CondFormats/DataRecord
cvs co -r V03-04-00 CondCore/HcalPlugins
cvs co -r V02-19-00 CalibCalorimetry/HcalAlgos
cvs co -r V02-13-00 CalibCalorimetry/HcalPlugins
cvs co -r V02-05-00 CondTools/Hcal
```

and the test tags are Salavat's lxplus space, /afs/cern.ch/user/a/abdullin/public/Conditions420. I was able to load all of the tags to a local database, but, alas, when I attempted to load them to Orcon by way of dropbox I was unsuccessful. Andrey took care of the rest.

trigger

Pile-up effects in the cross triggers seem to be under control compared to previous number (**see here**), but there is a problem: I don't know why these numbers are different than the previous numbers. As far as I can tell nothing changed. I'm starting from "scratch" to recreate the rates now.

DPS

New ntuples are in the oven. I messed up the trigger mapping and the typecasting of certain variables in the previous iteration so I'm redoing them now. I also have to run over Run2010A MinBias data since Mayda wants to switch streams (or change horses mid-stream). I suspect the motivation is, given we are already up against 2011 data-taking, that using comissioning data will not appear appealing to the ARC; they'l consider it a waste of time. Alas, the time already spent.

18 Feb

trigger

I reran the rates for some of the electron x-triggers and renamed them so they conform to the eGamma POG naming conventions (which changed again). I also ran over some of the pile-up samples (finally), and saw that there is a significant enhancement in the rates when pile-up is present especially for the e- triggers. There are some considerations to make when reviewing these results: the statistics are low so making a definitive statement is out of the question, and there are certain results which are counter-intuitive to the extent that they are either wrong or corrupted by the low statistics. All of these results are up on the **twiki** and were presented in the trigger meeting this afternoon.

14 Feb

DPS

First order of business: Look at events where we can isolate dijet pairs. This is done by making two additional requirements : pairing the highest two p_T jets, then the next two, require that the first pair be located on one side of the detector, in z/ , and the other pair in the other side. On top of this require that Δ of the pairs be greater than 2. The distributions are **here**

11 Feb

DPS

It's not, at this point, exactly clear where this analysis is going. There are systematic studies that need to be done, first of which is the effect of the JES. One useful thing would be to look at the correction factors in and p_T. I need to get the overall uncertainty for the current corrections and then see how this affects the fits like before.

The meeting with Rick Field was useful. He had three useful suggestions,

- Look at jets with a tighter cone size, say 0.2 rather than 0.5. This seems like it would be non-trivial. Since these collections aren't available in the official samples it would require that I rerun the jet collection producer which could be time time consuming. I'll hold off on this until some compelling reason to pursue this presents itself. Currently available collections are,

  ```
  vector
  ```

- Consider the effects of a scan of the p_T cut on the second jet pair. That is, require the first pair to be hard (p_T > 30 GeV), and allow the second pair to go as low at 10 GeV and raise it to the threshold of the first two. This is straight forward enough and will allow us to see how strongly dependent DPS is on our energy scale.

- Finally, or firstly, look for the signal. Since we assume DPS will consist of two uncorrelated, superimposed dijet events, look for exactly this. In order to avoid jets "eating each other up" I should include a Δ restriction. This value should be scanned.

I also ran a fit over what I have right now, even with the funky signal sample. The results are

```
Fit param:                deltaS:                 S_min                  sPt

SIG fraction: -0.0773653 +/- 0.0795894    -0.0189561 +/- 0.197025 0.158164 +/- 0.088
BG fraction:  1.07735 +/- 0.0855524       1.01902 +/- 0.198393    0.841907 +/- 0.088

Chi^2/NDF:                0.171545                        0.87513                1.
Probablilty:              1                       0.609827               0.433988
```

The priority for now is on regenerating the signal sample. It should be a large quantity so I should get the filter that Radek uses, given that mine doesn't work. Next I should pursue the last two items from Rick.

7 Feb

trigger

Simone had asked that I look at the effects of pile-up by running with our triggers over some MC samples. The result is that none of the events pass the triggers which is not surprising because the one sample is MinBias and one is QCD with ptHat > 15 GeV.

4 Feb

HCAL conditions

Updates need to be made for reprocessing of HI data. The only tags for which this is the case are Gains and RespCorrs.

- **Gains** : The current tag is usable since the current IOV in the tag, HcalGains_v2.32_offline, begins with a run the precedes the beginning of the HI run. The need changes are: to include the ZDC calibration constants from Taylan for IOV 148655...151249; then propagate the changes from the HLT tag to the offline tag.
- **Respcorrs** : Append the current IOV in the HLT tag.

3 Feb

trigger

Was seeing a discrepancy between my numbers and Aruna's. The source was the track isolation which I forgot to change the isolation variables from ints to floats (again). The result was that all of the rates were underestimated by some factor. It is now all under control, but the ntuples do not have the proper photon isolation. Comparison for validation.

DPS

Some **new distributions** with out the single primary vertex requirement. For these I require that there be at least one primary vertex and that all of the tag jets are associated to this vertex. There aren't really any significant changes, but two things are worth noting. The number of events increases by 50% and the dip in S is less pronounced.

1 Feb

trigger

Doh! Submitted some bad code. Set the photon isolation to the track isolation. The effect is probably not very significant, but it could do something depending on whether the other cuts have a tendency to enhance the effect of high energy photons in the isolation annulus.

27 Jan

DPS

Had to rerun the data ntuples to include a low threshold (minBias) trigger for the trigger study. Also included technical triggers this time though their effect is completely trivial in my case (< 10 events). I need to implement a script that will allow me to run over multiple datasets, binned QCD samples for instance, in one batch submission. It would also be useful to split the submissions by individual root files.

trigger

25 Jan

trigger

Further investigations of -lepton x-trigger for 1e33 menu. Want to verify Aruna's numbers and add some extra options. See twiki for details.

20 Jan

Focus has been on DPS and trigger development.

DPS

Recreated trigger study to determine 2-jet HT cut that makes us fully (or ~99%) efficient.

17 Jan

trigger

Current results are on twiki and in a talk given on Friday, **here**. Simone suggested that Pedrame, Aruna, Anton, and myself meet today to discuss where we should be going from here. Either way there are two things that need to be done ASAP:

- Update ntuple code with changes to track/photon isolation in the repository.
- Run μ- x-trigger analysis for e- x-trigger.

VBF

There a couple of things that will need to be done:

- Clean up leading jet distribution. Contact QCD/JMT people for fix.
- Look at μ and e distributions. Will need to get appropriate MC and run over e/ sample for electrons.
- Unfold distributions using bin-by-bin corrections.

MPI

Update all 4-jet DPS plots to include 38X MC and rereco. Going to need to do the same for the b-jets, but first need to fix bug with luminosity normalisation of distributions.

BRM

Just run the damn code! Need to have something in this department by the end of the week. Can just be something preliminary, but something.

12 Jan

trigger

Some updates on the **twiki**. To summarize, We have looked at the effect on the rates of varying the p_T of the leading track and the track(s) in the isolation annulus. Cutting on the lead track p_T, but this is probably just because the variation in the value of the threshold is much greater compared to that of the isolation track. We also looked at the effect of isolating the muon and varying the threshold of the muon. In the former case, the effect is quite significant, in the latter, not so much.

Simone's assessment is that we use the isolated muon. When ntuples are ready I am to do the same for electrons.

10 Jan

VBF

Met with Pietro this morning to discuss some plans. Need to give a talk on Friday to the forward physics people. The contents will be much of the material that I had already presented to the VBF folks with the following additions:

- Clean up bad runs/ excess of events in -2.5 < | | < -2.0.
- Include plots from discussion with Pietro today: Δ   vs. Δ . This should be done in two ways: one is the normal way; the other is to do a scan of the minimum Δ   value allowed and take the sum of all events for a given Δ . The latter needs some thought and may be slightly involved.
- Investigate in particular the case that you have two jets in the central region.
- Include leptons in the central region. This will require ntuplizing the mu and e/gamma stream data and the relevant MC.
- Unfold spectra to go from detector level distributions to hadron level.

trigger

Meeting with Simone at 2:30. Need to work out bug. Edit: done.

Conditions

Loaded a test tag for respCorrs in response to a request by Anton. Dropbox seems to be down.

09 Jan

Back to the grind...

Tau trigger

Today I am doing a scan of the trigger rates for the tau-muon cross-section. The four relevant parameters in the trigger are the E_T of the seed calotower of the tau; the leading track to reconstruct the tau; the maximum allowed track p_T in the isolation annulus; and the maximum allowed photon p_T in the isolation annulus. The latter two parameters, i.e., the isolation parameters, were originally just saved as the number of tracks/photons in the isolation region. Since the goal is to optimise the tau portion of the trigger, which will be somewhat involved, I've made a twiki to post my results to **here**.

There is a bug, perhaps, that is preventing the isolation cut from having any effect. Need to work this out ASAP.

-- NateOdell - 09-Jan-2011

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