AGN Results

Elizabeth Hays

Since last meeting:

- -more data
- -improved analysis
- -preliminary upper limits for Stecker and De Jager IR

Still to do:

- -finish limits for Somerville/Primack IR
- -finish timescale analysis
- -nice plots for limits
- -worry about detector response some more
- -get some sleep

Data

Dates: MJD 51893-52802

Dec 15, 2000-June 12, 2003

834 days exposure

Analysis:

nFit>20

X2>2.5

2.1 deg bin

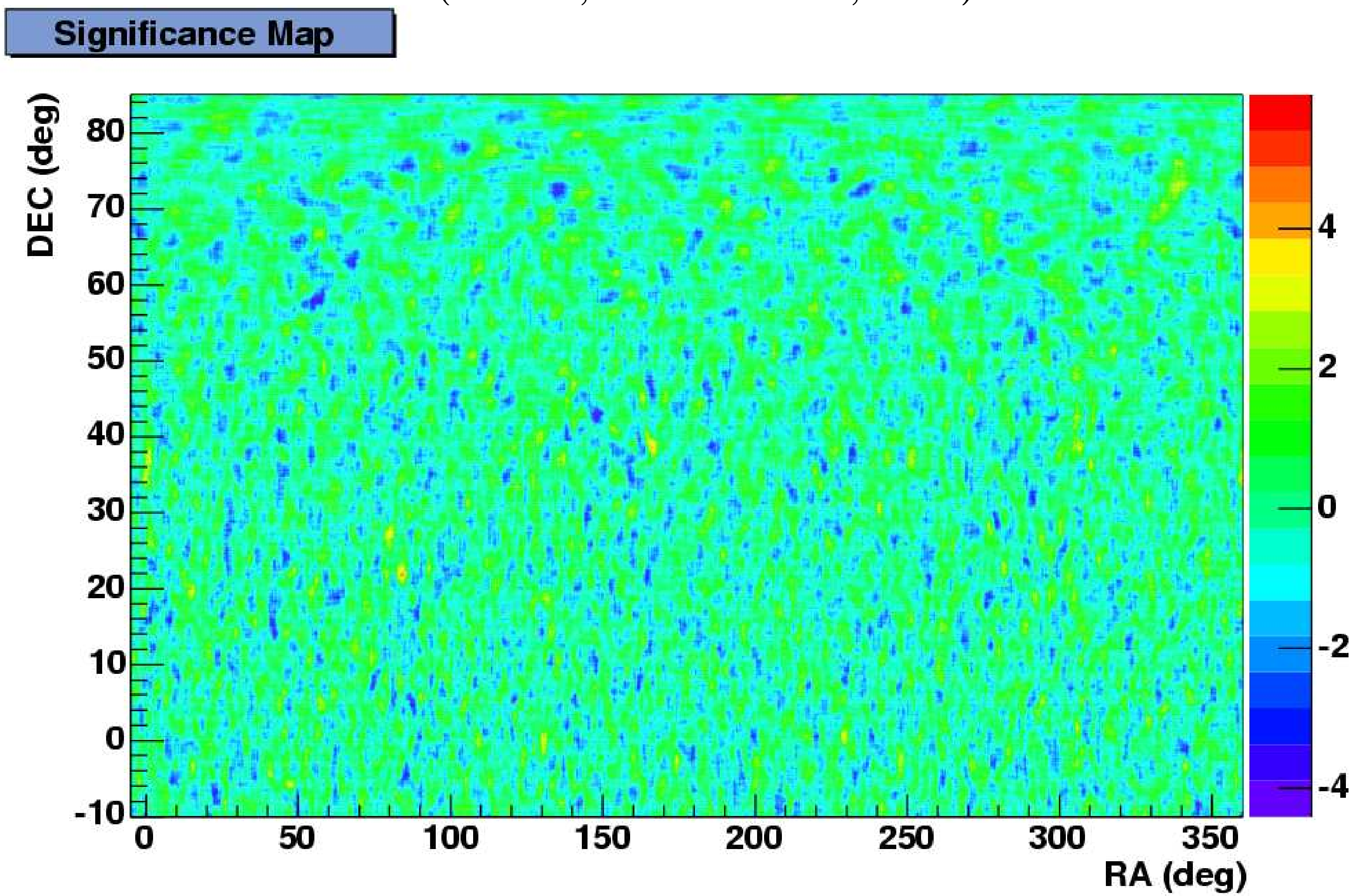
zenith_align2 correction

Removed short runs, calibration runs, short maps

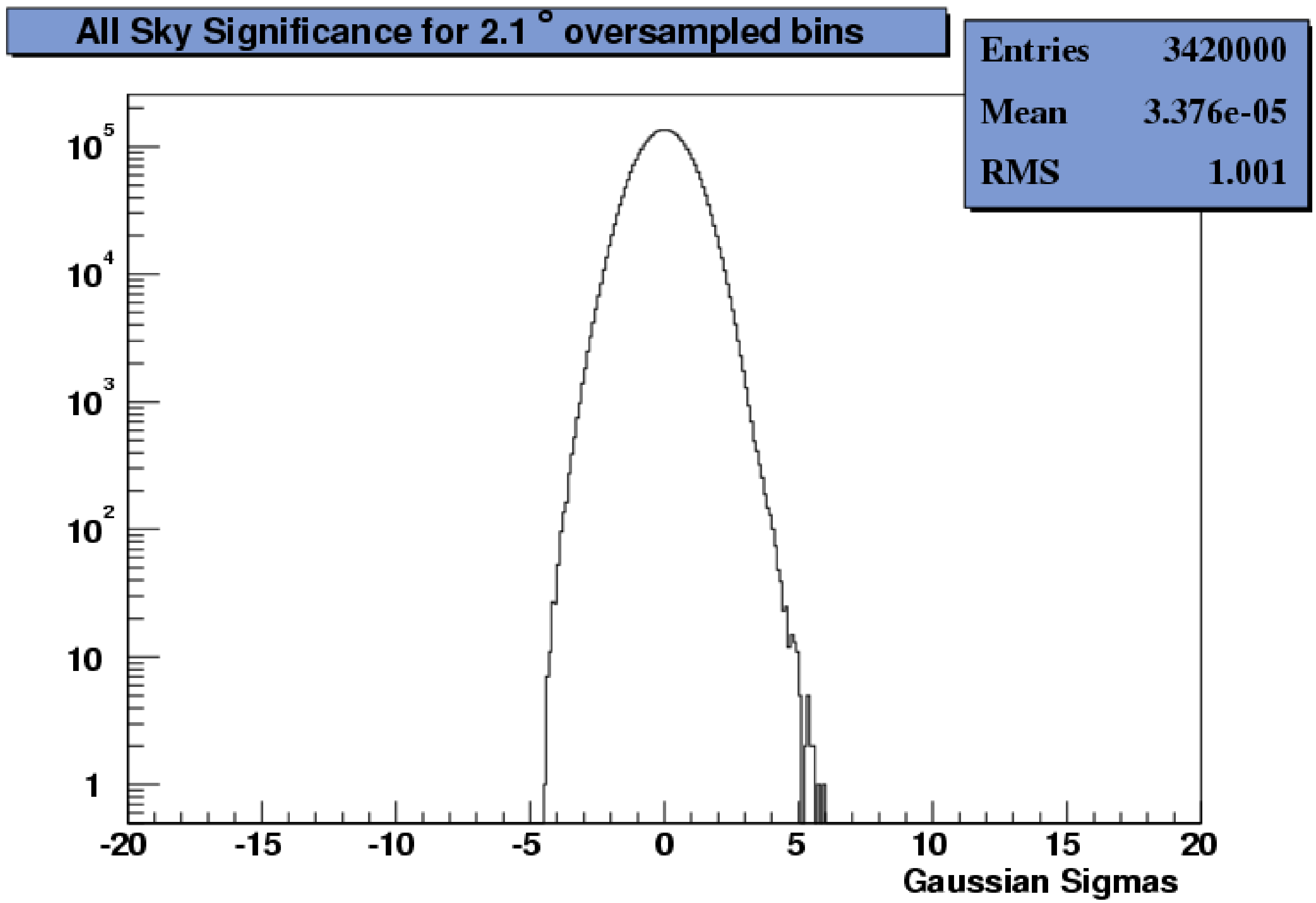
All-Sky Map

MJD 51893-52802

(Dec 15,2000 - June 12, 2003)



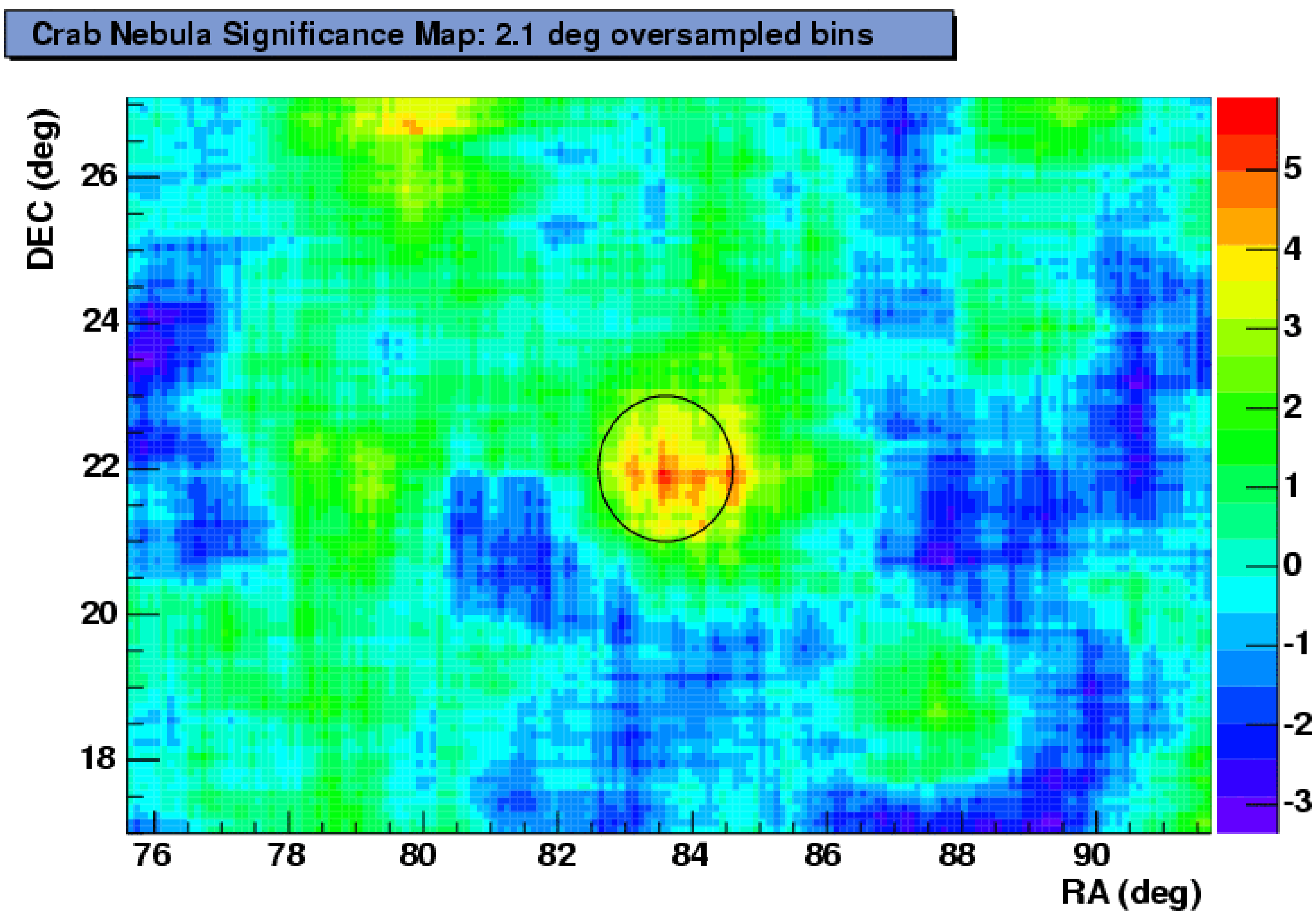
All-Sky Significance



Crab Nebula

4.88 sigma

On: 2417185   Off: 2409906   Excess: 7279

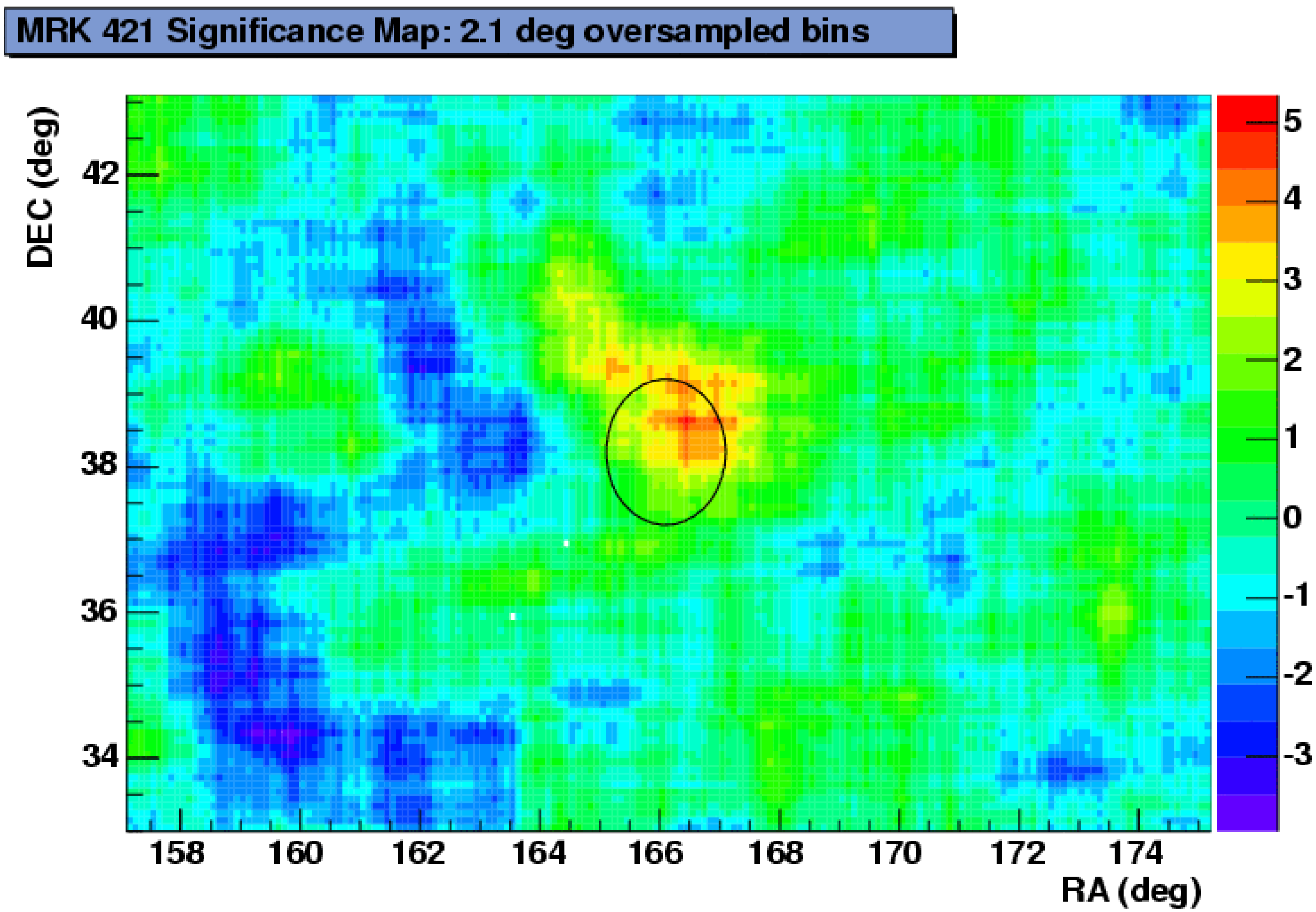


AGN Results: July 11, 2003

MRK 421

3.57 sigma

On: 3490886   Off: 3484521   Excess: 6365



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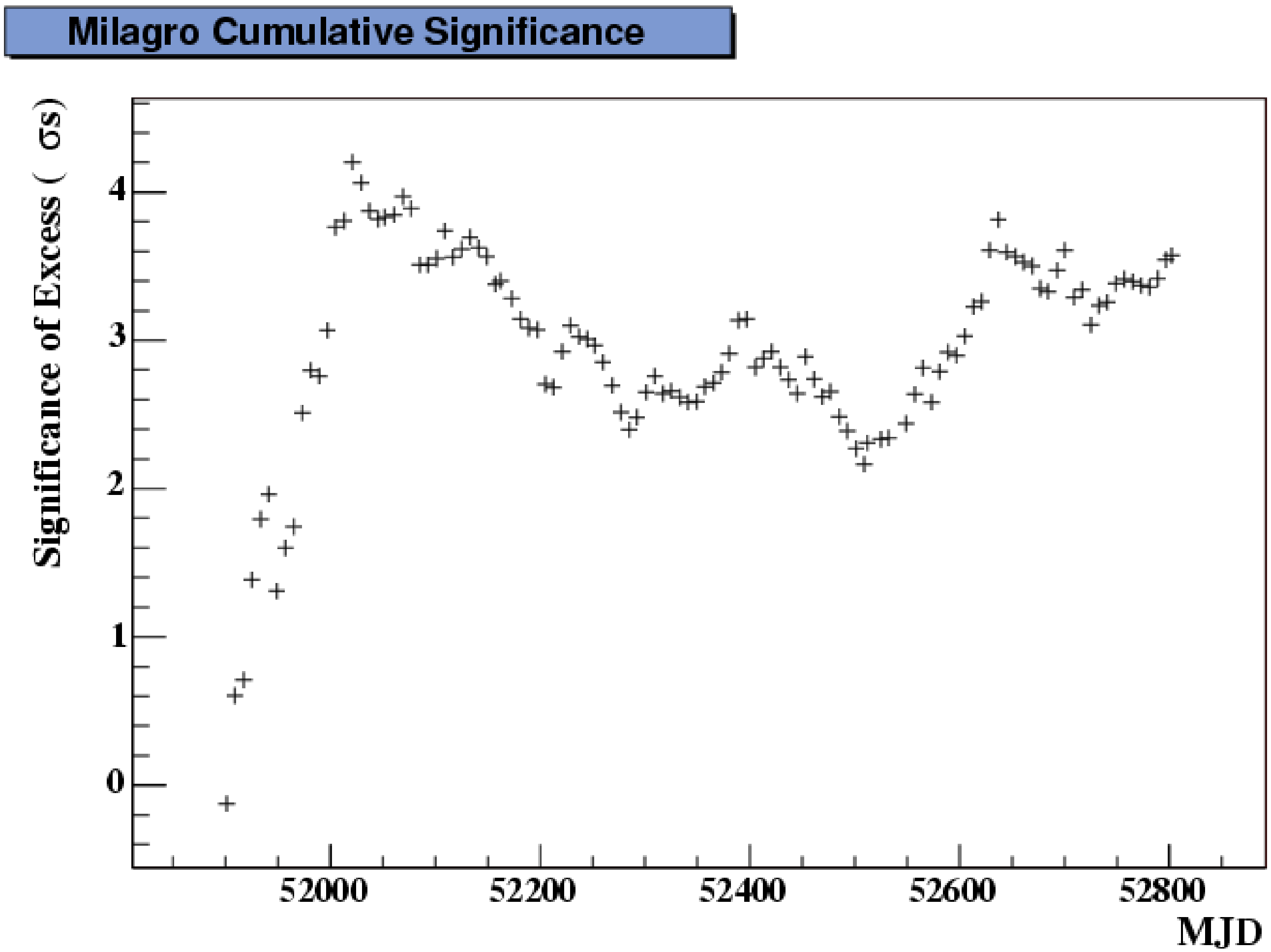
MRK 421 Significance

MJD 51893-52802



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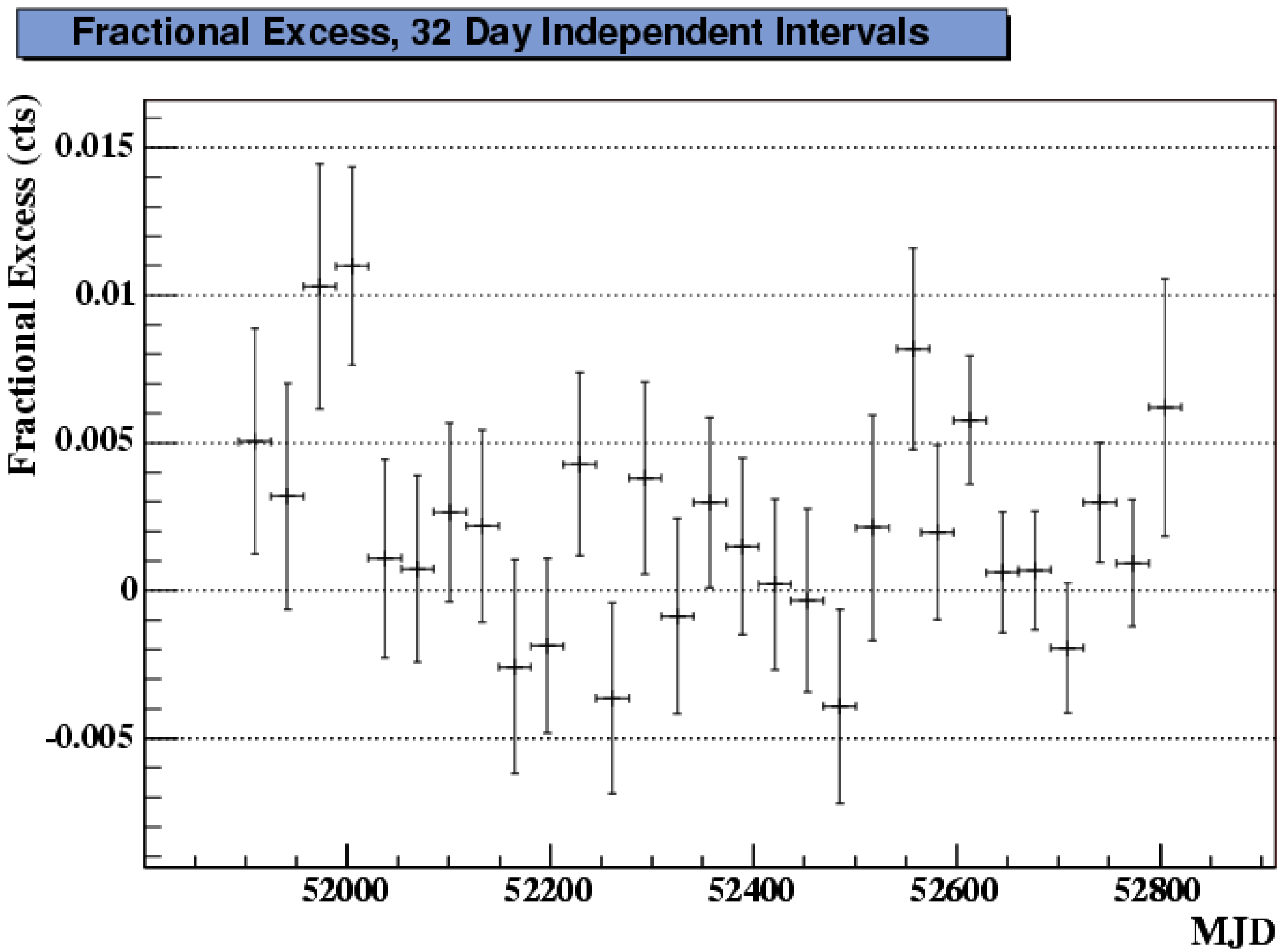
MRK 421 Fractional Excess



Costamante AGN List

(northern Hemisphere)

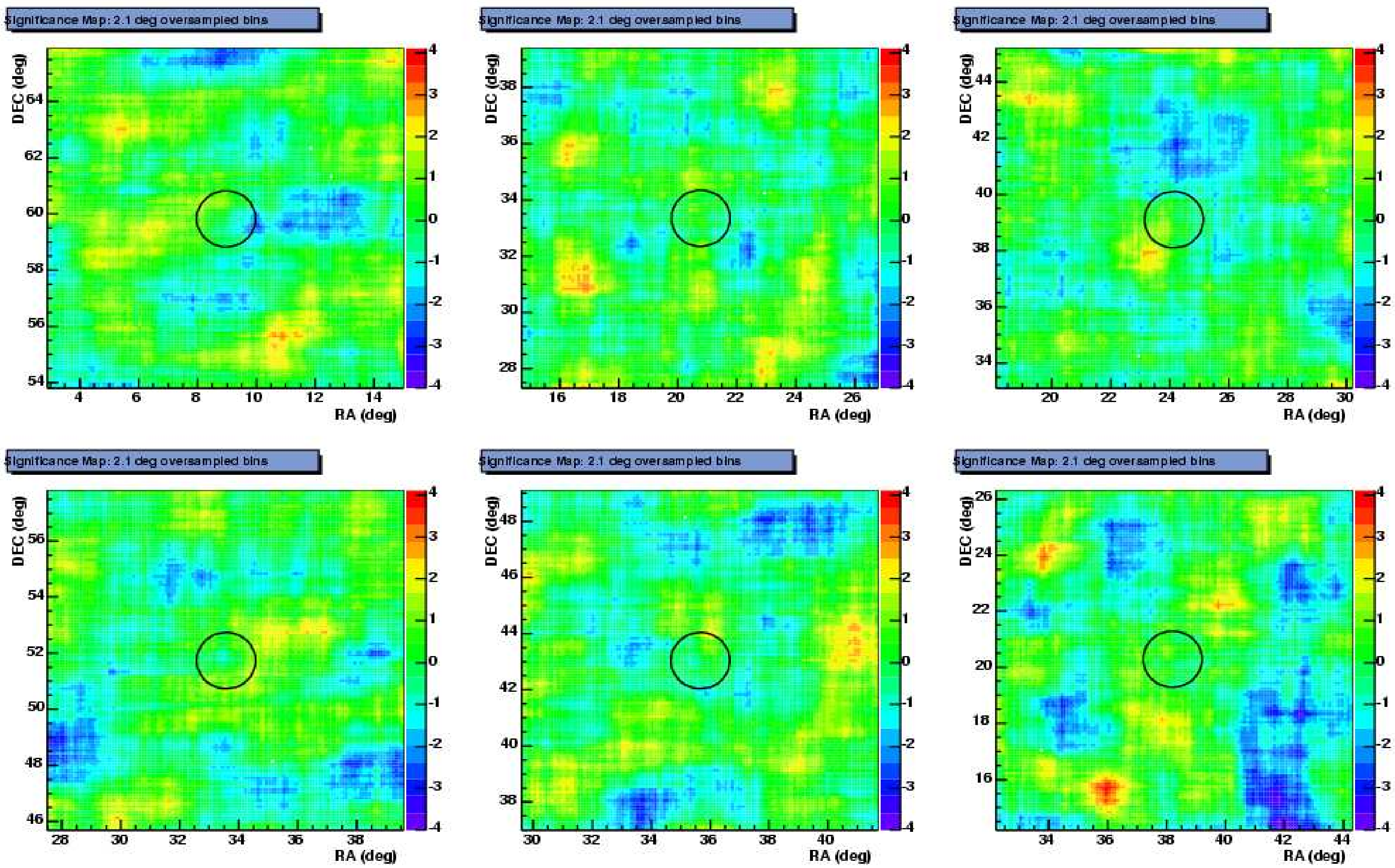
Name	DEC (deg)	Z	alpha1	alpha2
0033+595	59.83	0.086	2.07	2.01
0120+340	34.35	0.272	2.15	2.20
0136+391 *	39.10	0.200	2.15	2.60
0214+517	51.74	0.049	2.05	2.95
0219+428	43.04	0.444	3.05	2.40
0229+200	20.29	0.139	2.13	2.50
0323+022	2.42	0.147	2.15	2.50
0414+009	1.09	0.287	2.33	2.20
0647+250 *	25.05	0.200	2.20	2.60
0806+524	52.32	0.138	2.22	2.40
0809+024 *	2.63	0.200	2.18	2.30
0851+203	20.11	0.306	3.05	2.40
1011+496	49.43	0.200	2.36	2.40
1028+511	50.89	0.361	2.51	2.20
1114+202	20.24	0.139	2.05	3.60
1133+704	70.16	0.045	2.10	2.70
1136+673	67.62	0.135	2.10	2.50
1215+303	30.12	0.237	2.60	2.80
1218+304	30.18	0.182	2.11	2.90
1417+257	25.72	0.237	2.17	2.40
1440+122	12.01	0.162	1.99	2.50
1544+820 *	81.92	0.200	2.12	2.30
1553+113	11.19	0.360	2.78	2.60
1722+119	11.87	0.018	1.93	2.60
1727+502	50.22	0.055	2.06	2.50
1741+196	19.59	0.084	2.07	2.80
1959+650	65.15	0.047	2.08	2.60
2200+420	42.28	0.069	2.57	3.30

* indicates redshift is unknown and the given redshift, 0.2, is the mean for the sample.

Alpha1 is an estimate for the power law index using calculated flux >300 GeV and >1 TeV.

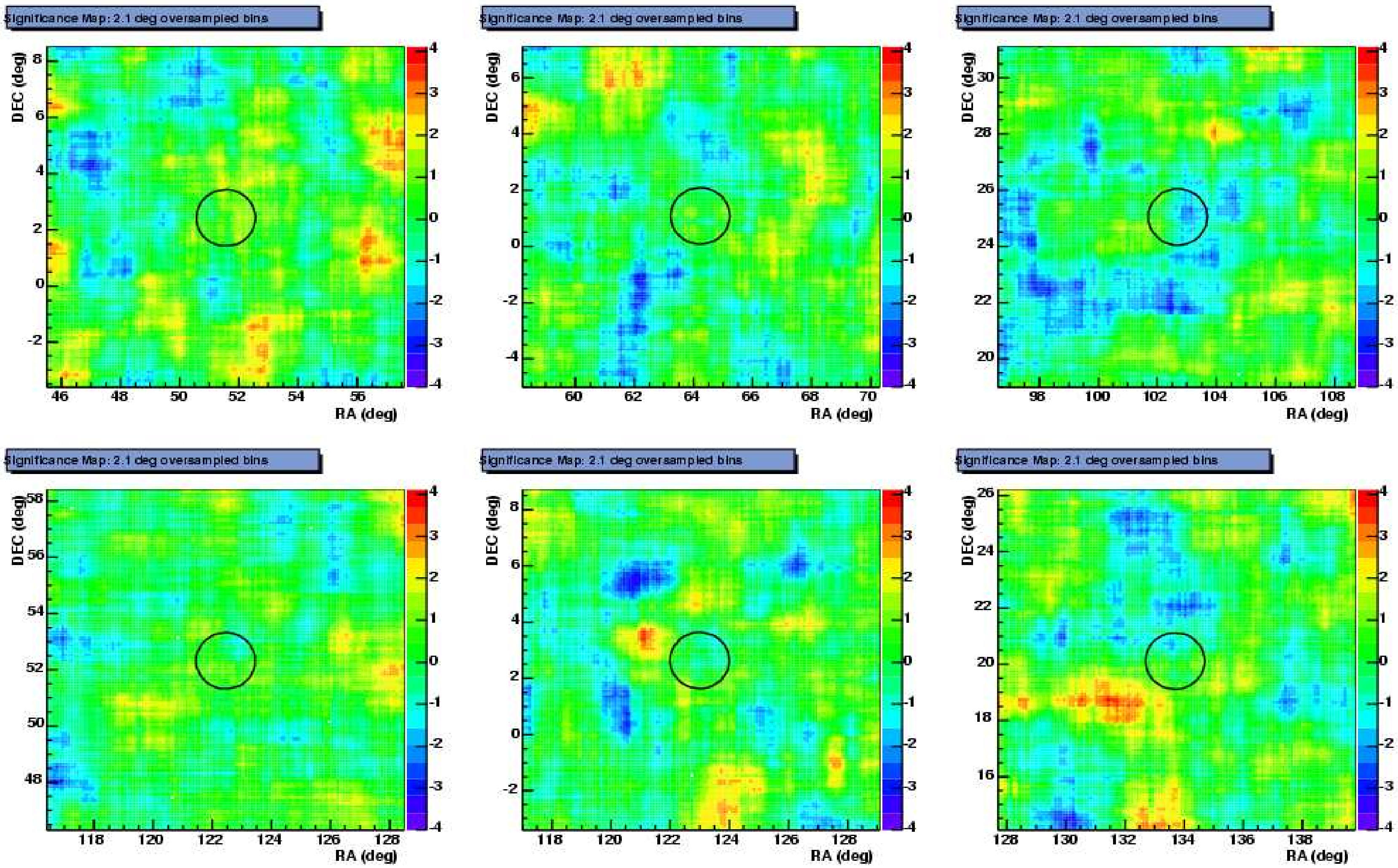
Alpha2 is taken from a parameter in the SSC model fit.

AGN Maps



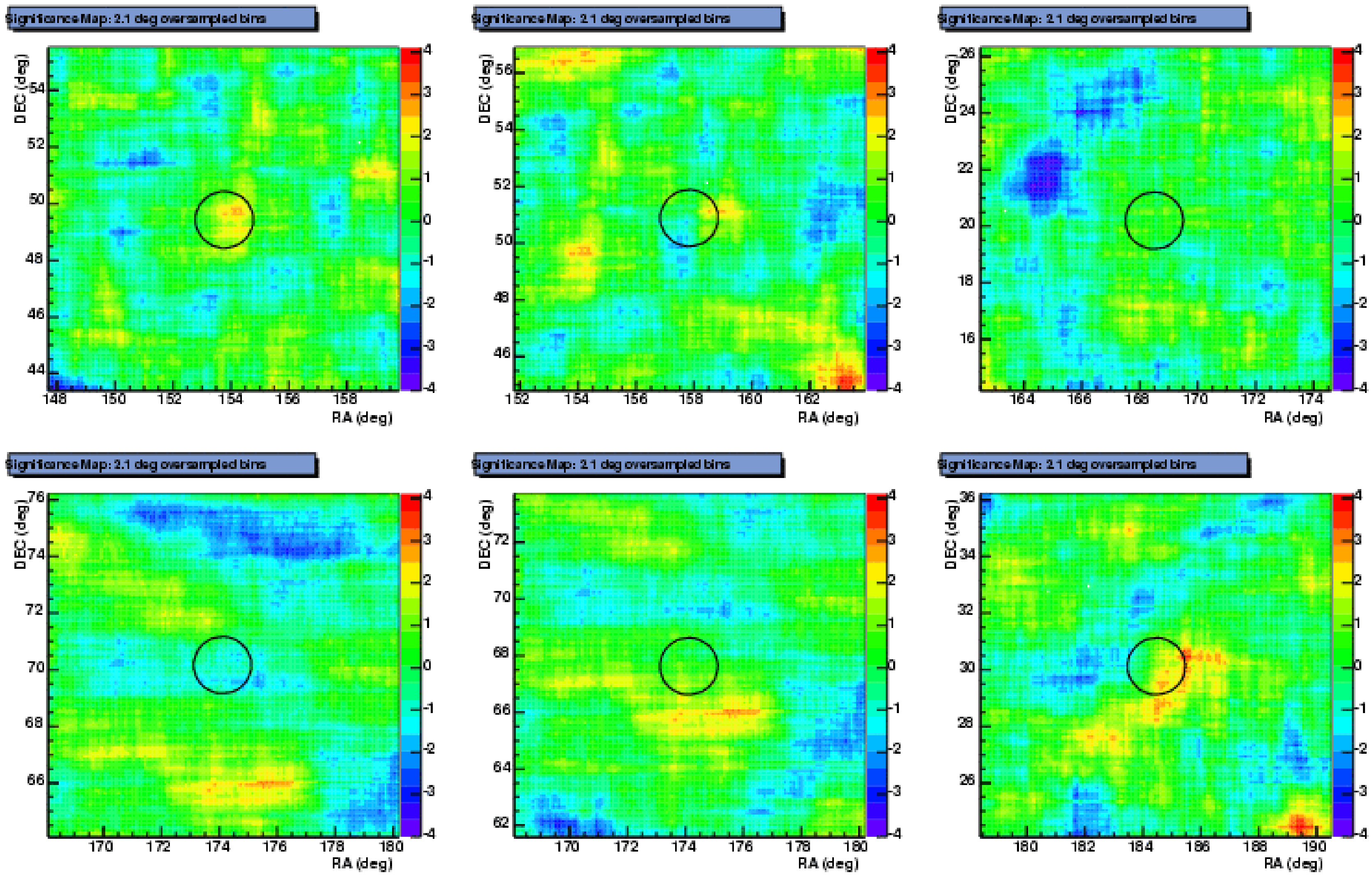
AGN Results: July 11, 2003

AGN Maps 2



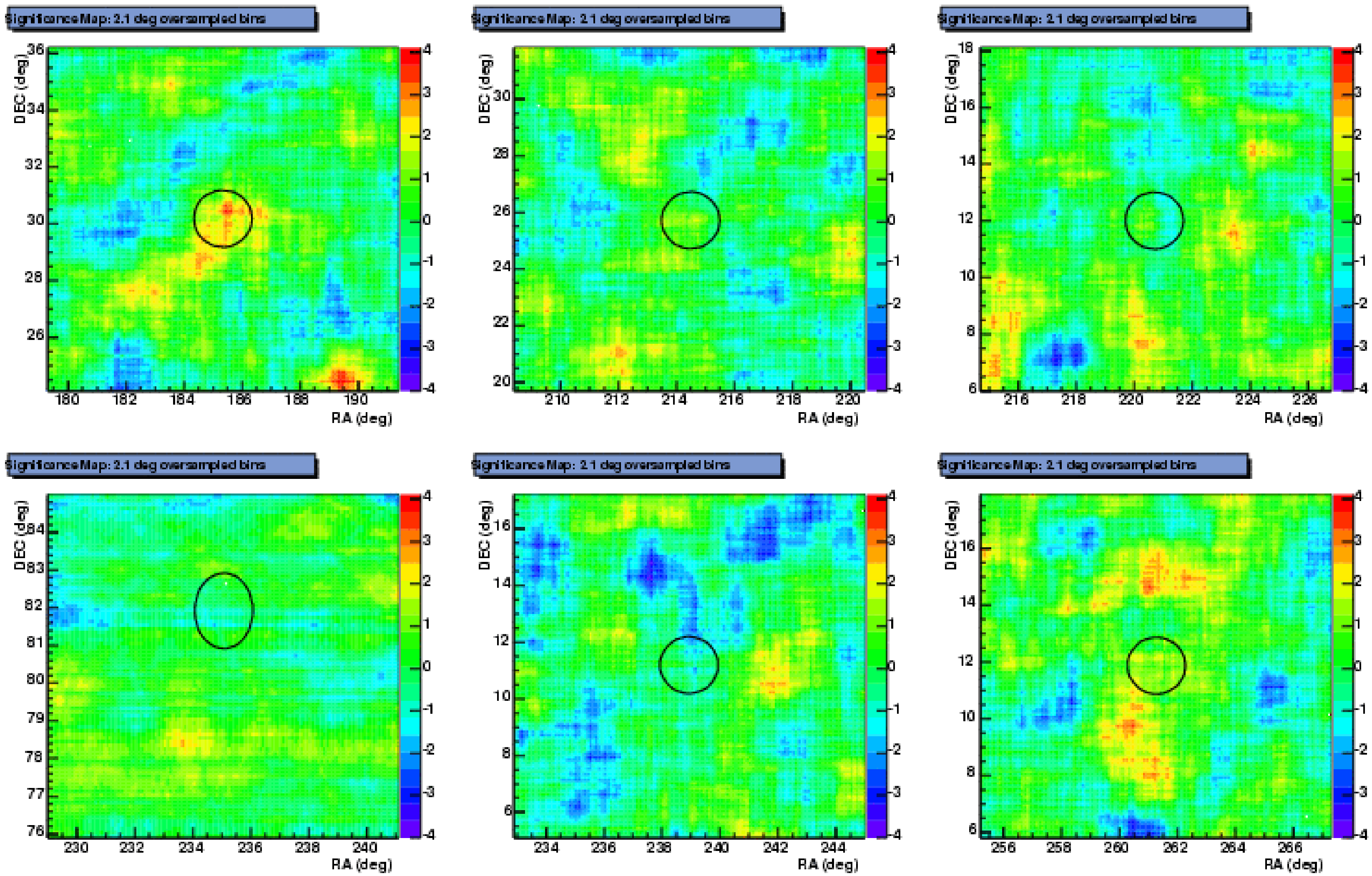
AGN Results: July 11, 2003

AGN Maps 3

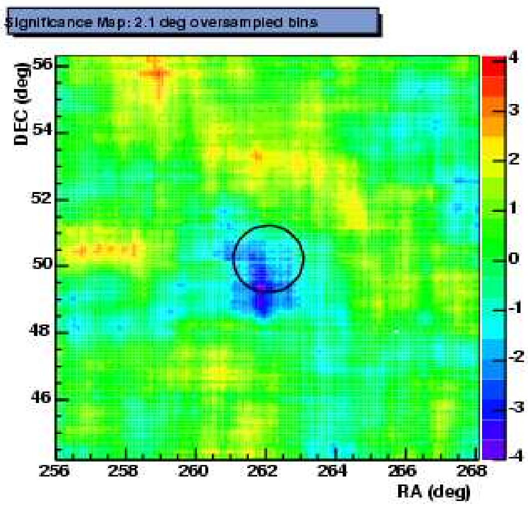


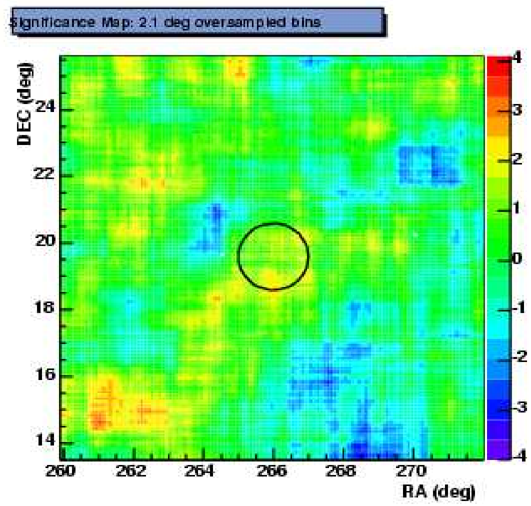
AGN Results: July 11, 2003

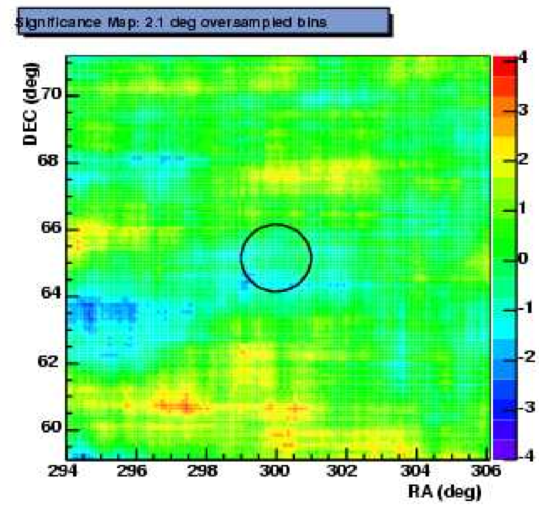
AGN Maps 4

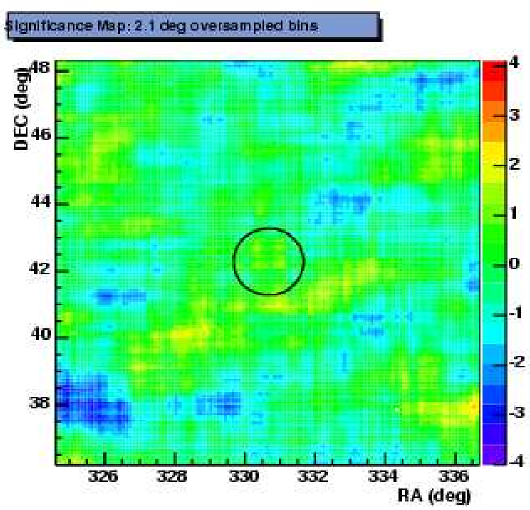

Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)

AGN Maps 5

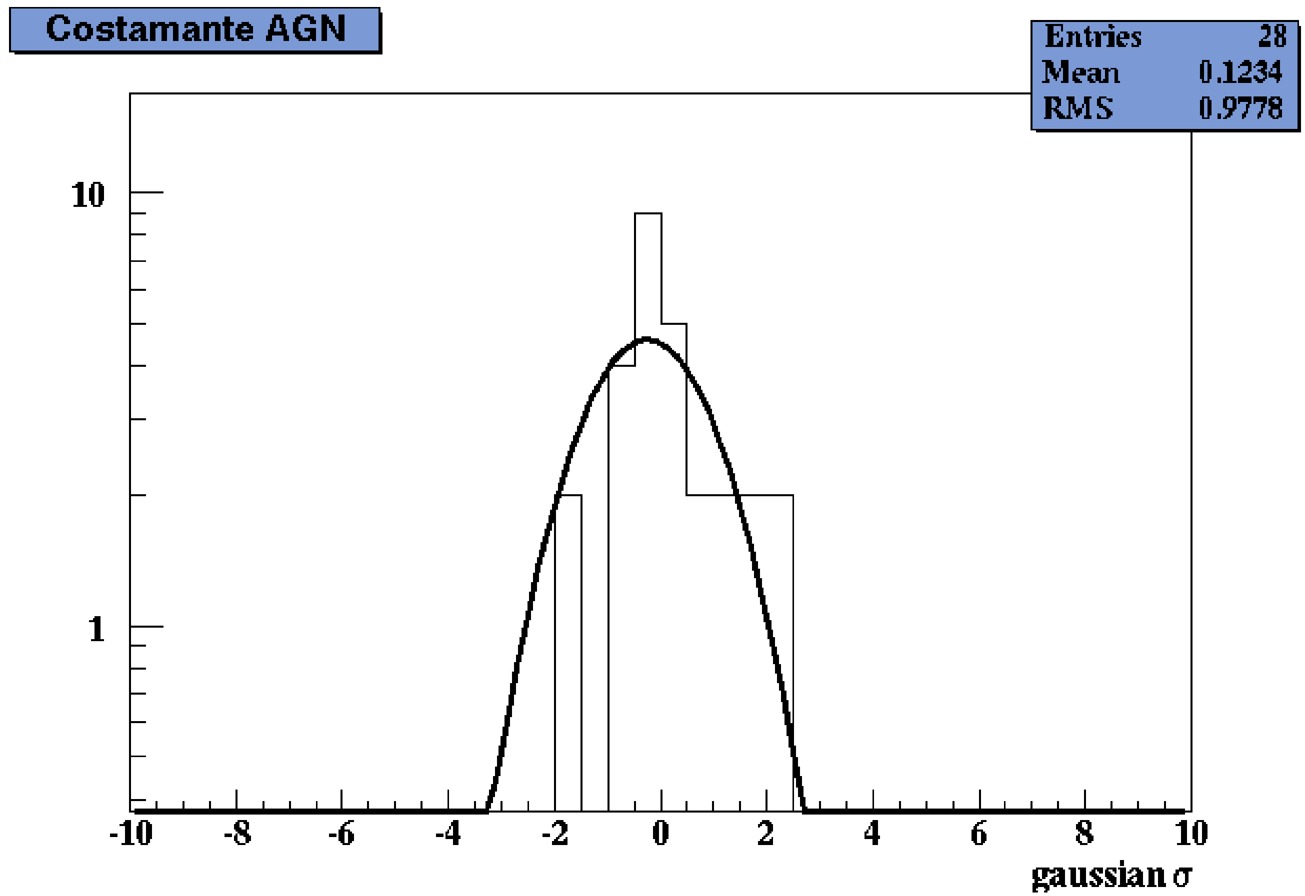

Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
256 258 260 262 264 266 268
46 48 50 52 54 56
-4 -3 -2 -1 0 1 2 3 4


Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
260 262 264 266 268 270
14 16 18 20 22 24
-4 -3 -2 -1 0 1 2 3 4


Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
294 296 298 300 302 304 306
60 62 64 66 68 70
-4 -3 -2 -1 0 1 2 3 4


Significance Map: 2.1 deg oversampled bins
DEC (deg)
RA (deg)
326 328 330 332 334 336
38 40 42 44 46 48
-4 -3 -2 -1 0 1 2 3 4

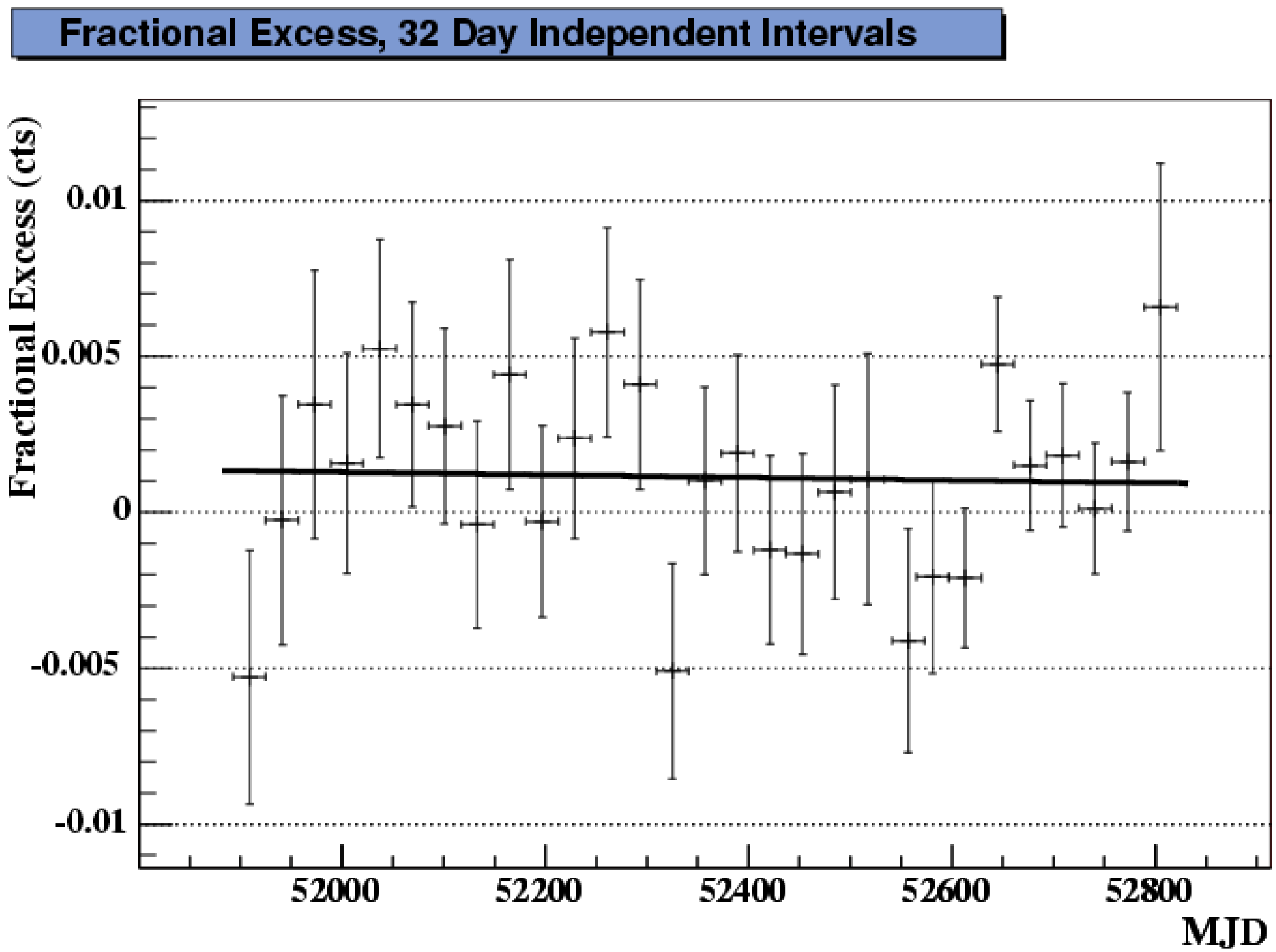
Significance Distribution of Sample



1218+304

Most significant AGN of sample (aka. 1H1219+301)

2.05 sigma On: 3222419   Off: 3218878   Excess: 3541



Integral Flux Comparison-Fossati

[Flux] = 10^{-11} photons cm^{-2} s^{-1}

	Name	Z	CG F>300	F>300 z=0	F>300 IR1	F>300 IR2
*	0033+595	0.086	2.04	1.24	11.67	14.59
	0120+340	0.272	0.28	1.62	10.05	8.21
	0136+391	0.200	0.56	1.32	8.77	8.38
*	0214+517	0.049	5.93	0.94	3.77	4.63
	0219+428	0.444	0.14	5.24	2.08	0.94
	0229+200	0.139	0.96	1.95	16.81	18.54
	0323+022	0.147	0.84	3.61	96.02	112.10
	0414+009	0.287	0.23	6.37	181.41	163.39
	0647+250	0.200	0.59	0.98	6.75	6.39
	0806+524	0.138	1.36	1.55	11.60	12.71
	0809+024	0.200	0.58	2.62	90.05	96.83
	0851+203	0.306	0.42	6.74	8.74	6.03
	1011+496	0.200	0.12	3.82	21.69	20.53
	1028+511	0.361	0.43	2.37	7.39	4.76
	1114+202	0.139	1.17	1.69	16.92	19.03
*	1133+704	0.045	8.50	1.67	12.10	15.94
	1136+673	0.135	0.92	2.47	67.82	80.27
	1215+303	0.237	0.16	4.68	13.13	11.03
	1218+304	0.182	0.67	2.47	18.34	18.44
	1417+257	0.237	0.38	2.45	18.39	16.36
	1440+122	0.162	0.78	1.27	27.28	30.33
	1553+113	0.360	0.20	7.23	17.06	10.98
*	1722+119	0.018	12.80	1.65	3.84	4.72
*	1727+502	0.055	5.19	0.62	2.56	3.13
*	1741+196	0.084	3.59	2.25	14.17	17.04
*	1959+650	0.047	7.46	1.31	8.12	10.77
*	2200+420	0.069	3.32	3.21	7.62	8.37

AGN Results: July 11, 2003

Integral Flux Comparison-SSC

Name	Z	CG F>300	F>300 Z=0	F>300 IR1	F>300 IR2
0033+595	0.086	0.25	1.06	11.05	13.93
0120+340	0.272	0.30	1.78	9.88	8.03
0136+391	0.200	0.14	2.85	8.21	7.38
0214+517	0.049	0.07	4.87	8.34	9.03
0219+428	0.444	0.00	2.23	3.18	1.52
0229+200	0.139	0.31	4.14	18.24	18.95
0323+022	0.147	0.01	9.78	110.53	123.54
0414+009	0.287	0.07	4.27	182.47	166.25
0647+250	0.200	0.24	2.02	6.32	5.65
0806+524	0.138	0.00	2.25	12.16	12.92
0809+024	0.200	0.04	3.71	92.23	97.93
0851+203	0.306	0.00	2.50	11.66	8.66
1011+496	0.200	0.14	4.12	21.60	20.33
1028+511	0.361	0.00	1.28	8.45	5.68
1114+202	0.139	0.10	14.52	16.77	15.37
1133+704	0.045	0.03	8.56	26.93	31.67
1136+673	0.135	0.10	7.55	79.20	87.17
1215+303	0.237	0.00	6.11	12.28	10.06
1218+304	0.182	0.16	8.66	16.79	15.16
1417+257	0.237	0.21	3.83	17.52	15.04
1440+122	0.162	0.09	4.34	30.24	30.91
1553+113	0.360	0.42	5.11	18.45	12.15
1722+119	0.018	0.02	8.11	13.06	14.82
1727+502	0.055	0.07	1.51	3.90	4.44
1741+196	0.084	0.29	8.88	21.16	22.73
1959+650	0.047	0.03	4.98	16.75	20.09
2200+420	0.069	0.17	6.88	8.96	9.05

I0: no IR

$dN/dE = I0 * E^{-\alpha}$ $[I0] = 10^{-11}$ photons cm^{-2} s^{-1} TeV^{-1}

Name	Alpha SED1	I0 SED1	Alpha SED2	I0 SED2
0033+595	2.07	0.37	2.01	0.32
0120+340	2.15	0.47	2.20	0.50
0136+391	2.15	0.38	2.60	0.67
0214+517	2.05	0.28	2.95	0.91
0219+428	3.05	0.91	2.40	0.58
0229+200	2.13	0.57	2.50	1.02
0323+022	2.15	1.04	2.50	2.41
0414+009	2.33	1.71	2.20	1.21
0647+250	2.20	0.28	2.60	0.47
0806+524	2.22	0.44	2.40	0.58
0809+024	2.18	0.75	2.30	1.01
0851+203	3.05	1.17	2.40	0.65
1011+496	2.36	1.01	2.40	1.07
1028+511	2.51	0.58	2.20	0.36
1114+202	2.05	0.50	3.60	1.65
1133+704	2.10	0.49	2.70	1.88
1136+673	2.10	0.72	2.50	1.86
1215+303	2.60	1.09	2.80	1.26
1218+304	2.11	0.72	2.90	1.67
1417+257	2.17	0.70	2.40	0.99
1440+122	1.99	0.38	2.50	1.07
1553+113	2.78	1.51	2.60	1.19
1722+119	1.93	0.50	2.60	1.89
1727+502	2.06	0.18	2.50	0.37
1741+196	2.07	0.66	2.80	1.83
1959+650	2.08	0.39	2.60	1.16
2200+420	2.57	0.76	3.30	0.99

I0 with IR

$dN/dE = I0*E^{-\alpha}e^{-\tau(E,z)}$ $[I0] = 10^{-11}$ photons cm^{-2} s^{-1} TeV^{-1}

		SED 1		SED 2	
Name	Z	I0 IR1	I0 IR2	I0 IR1	I0 IR2
0033+595	0.086	7.64	11.70	7.55	11.70
0120+340	0.272	30.10	46.60	28.20	43.40
0136+391	0.200	13.50	20.20	8.37	11.60
0214+517	0.049	1.86	2.60	2.15	2.58
0219+428	0.444	18.00	27.80	54.70	90.70
0229+200	0.139	15.90	23.90	12.60	17.60
0323+022	0.147	95.20	154.00	81.10	124.00
0414+009	0.287	530.00	940.00	605.00	1,090.00
0647+250	0.200	9.93	14.70	6.44	8.88
0806+524	0.138	10.10	15.00	9.09	13.00
0809+024	0.200	135.00	227.00	124.00	205.00
0851+203	0.306	15.10	21.30	38.60	59.70
1011+496	0.200	27.60	40.60	26.50	38.70
1028+511	0.361	40.00	64.20	62.60	106.00
1114+202	0.139	17.10	26.30	4.25	5.09
1133+704	0.045	5.60	8.31	8.23	10.70
1136+673	0.135	63.70	102.00	53.10	77.90
1215+303	0.237	18.40	26.20	14.20	19.60
1218+304	0.182	25.10	37.90	11.20	14.80
1417+257	0.237	38.70	59.20	29.70	43.50
1440+122	0.162	35.00	56.10	24.90	36.00
1553+113	0.360	69.20	110.00	90.00	147.00
1722+119	0.018	1.52	1.99	3.57	4.24
1727+502	0.055	1.32	1.86	1.48	1.91
1741+196	0.084	9.13	13.40	7.70	9.84
1959+650	0.047	3.87	5.81	5.59	7.46
2200+420	0.069	3.02	3.86	1.94	2.24

Flux>E_{med} no IR

NAME	alpha1	Emed 1	F>Emed 1	alpha 2	Emed 2	F>Emed 2
0033+595	2.07	9.55	0.032	2.01	10.965	0.029
0120+340	2.15	5.495	0.065	2.2	5.012	0.069
0136+391	2.15	5.495	0.052	2.6	2.399	0.118
0214+517	2.05	8.318	0.031	2.95	1.585	0.219
0219+428	3.05	1.096	0.424	2.4	3.467	0.083
0229+200	2.13	6.607	0.065	2.5	3.467	0.121
0323+022	2.15	15.849	0.038	2.5	10	0.057
0414+009	2.33	13.183	0.045	2.2	16.596	0.035
0647+250	2.2	5.248	0.036	2.6	2.512	0.078
0806+524	2.22	6.026	0.045	2.4	4.365	0.06
0809+024	2.18	12.589	0.034	2.3	10.965	0.038
0851+203	3.05	1.259	0.414	2.4	3.981	0.077
1011+496	2.36	4.365	0.114	2.4	3.981	0.127
1028+511	2.51	3.467	0.068	2.2	6.31	0.037
1114+202	2.05	7.586	0.042	3.6	0.55	2.371
1133+704	2.1	16.596	0.02	2.7	6.607	0.051
1136+673	2.1	14.454	0.036	2.5	7.943	0.063
1215+303	2.6	2.399	0.194	2.8	1.738	0.3
1218+304	2.11	6.026	0.098	2.9	1.445	0.504
1417+257	2.17	5.495	0.091	2.4	3.631	0.134
1440+122	1.99	10.965	0.037	2.5	4.786	0.078
1553+113	2.78	3.02	0.136	2.6	4.169	0.087
1722+119	1.93	12.023	0.053	2.6	4.169	0.139
1727+502	2.06	7.244	0.023	2.5	3.311	0.047
1741+196	2.07	7.586	0.077	2.8	1.995	0.338
1959+650	2.08	10.965	0.028	2.6	5.754	0.05
2200+420	2.57	2.512	0.132	3.3	0.724	1.049

Flux> E_{med} with IR

NAME	Emed SED1 IR1	F>Emed	Emed SED2 IR1	F>Emed
0033+595	1.202	0.52	1.259	0.473
0120+340	0.288	12.612	0.275	14.645
0136+391	0.38	4.864	0.316	7.963
0214+517	1.738	0.169	0.661	1.297
0219+428	0.145	119.153	0.166	69.896
0229+200	0.55	3.821	0.437	7.165
0323+022	0.575	17.715	0.525	22.816
0414+009	0.275	291.555	0.275	290.482
0647+250	0.363	4.323	0.302	7.149
0806+524	0.525	2.921	0.479	3.733
0809+024	0.55	13.096	0.525	15.012
0851+203	0.2	58.786	0.229	38.621
1011+496	0.347	15.765	0.347	15.607
1028+511	0.209	43.025	0.229	31.251
1114+202	0.575	2.398	0.229	34.217
1133+704	2.512	0.255	1	1.775
1136+673	0.603	12.286	0.525	17.579
1215+303	0.263	24.205	0.24	31.968
1218+304	0.417	8.041	0.275	25.939
1417+257	0.316	17.867	0.288	23.243
1440+122	0.55	5.745	0.417	12.654
1553+113	0.209	107.809	0.209	109.908
1722+119	5.495	0.06	2.291	0.284
1727+502	1.514	0.13	0.912	0.358
1741+196	0.955	1.209	0.525	5.407
1959+650	2.884	0.122	1.445	0.489
2200+420	0.692	1.173	0.363	5.968