Nagoya Meeting
November 14-16, 2002

Status of Phase 2: As Understood by US and Athens

Event Classification:
The following table is a list of the status of phase II events. There are a total of 227 events. Note: We no longer consider 12 events (TYPE=-1) worth pursuing (Visible Energy < 2 GeV). Here is a summary of the table:

KEY:

TYPE		Number of Events
-1	Total visible energy < 2 GeV	12
0	No muon or electron identified	74
1	Muon CC	100
2	"e" CC	39
11	μ-μ	2

LOCATION		Number of Events
-2	No .rft	0
-1	No .dft(No eml. Information)	55[1]
0	.dft Exists but Not Located	8[2]
1	located	164

[1] 9 of the 55 (location status = -1) are type =-1.
[2] 1 of the 8 (location status = 0) are type =-1.

EVENT	TYPE (Visible Scan)	ANN Result (Yes=Agrees with visible scan)	LOCATED
2792_23427	0	NC	1
2794_22176	1	Yes	1
2807_29391	1	Yes	-1
2808_17867	0	e CC	1
2809_11206	2	Yes	1
2810_00291	2	Yes	1
2811_20190	0	NC	1
2845_02119	0	NC	1

2852_07545	0	e CC	1
2879_12293	1	Yes	1
2881_06913	1	Yes	-1
2895_20391	1	Yes	-1
2896_02459	2	Yes	-1
2897_04055	0	NC	1
2897_21536	0	NC	-1
2899_08585	2	Yes	1
2899_23193	1	Yes	1
2910_05629	0	NC	1
2929_20792	0	muon CC	1
2931_05411	0	NC	1
2934_00494	1	Yes	1
2938_17780	2	Yes	1
2985_10000	2	no	1
2986_00355	1	Yes	1
2986_10774	1	Yes	1
2986_24191	0	e CC	-1
2991_17651	1	Yes	-1
2998_00127	1	Yes	1
3000_17634	2	Yes	1
3004_02356	1	no	-1
3004_28391	1	Yes	-1
3005_11384	1	no	1
3007_22813	1	Yes	1
3008_06844	0	NC	1
3008_29159	1	no	1
3020_18055	0	NC	1
3020_31877	2	e CC	1
3021_20971	1	no	1
3024_03606	2	no	1
3024_18706	2	Yes	1
3024_25696	0	e CC	1
3025_04280	0	NC	1
3025_12221	2	Yes	1
3025_22687	1	Yes	-1
3026_02599	0	e CC	1
3039_00914	2	Yes	1
3039_23886	0	e CC	-1
3040_09776	0	e CC	1
3040_20015	1	no	1
3043_06870	0	NC	1
3062_04947	1	Yes	1
3067_14134	1	Yes	1
3067_18502	1	Yes	1

3067_20156	1	Yes	1
3067_23440	1	Yes	1
3069_01650	1	Yes	1
3073_18731	1	Yes	1
3073_22977	1	Yes	1
3074_16555	0	NC	1
3076_10917	1	Yes	-1
3095_02402	1	Yes	1
3096_29351	1	Yes	1
3099_05685	0	NC	1
3099_14206	-1		-1
3101_09193	0	NC	1
3102_02116	-1		-1
3102_04584	1	Yes	1
3107_01688	0	NC	1
3107_07043	0	NC	1
3110_06126	1	Yes	1
3110_27773	1	Yes	1
3111_06248	0	NC	1
3111_09249	1	Yes	1
3112_29143	1	Yes	1
3113_03360	-1		-1
3113_08545	1	Yes	1
3116_02059	1	Yes	1
3117_09388	11		1
3117_14277	-1		-1
3117_23319	0	e CC	-1
3118_29133	1	Yes	1
3118_29587	11		1
3119_00164	2	Yes	1
3119_02266	1	Yes	1
3119_06573	1	Yes	1
3119_17999	-1		-1
3119_22580	0	e CC	1
3119_26736	1	Yes	1
3120_32965	1	Yes	-1
3121_03060	0	NC	-1
3121_17404	-1		-1
3121_32288	-1		0
3123_02276	-1		1
3136_06861	2	Yes	1
3136_15846	1	Yes	1
3138_02287	0	NC	1
3138_03097	0	NC	-1
3140_00386	1	Yes	1

3140_17870	2	Yes	1
3142_02026	0	NC	1
3143_07196	1	Yes	-1
3145_12751	1	Yes	1
3148_04051	0	NC	1
3171_19857	0	NC	1
3172_15502	2	Yes	1
3175_19197	1	Yes	1
3176_00801	2	Yes	1
3177_16190	0	NC	-1
3181_04272	1	Yes	-1
3181_13626	0	NC	1
3182_10057	0	muon CC	-1
3186_06199	1	Yes	1
3186_10893	2	Yes	1
3186_17033	2	Yes	1
3186_21341	1	Yes	1
3187_10388	0	e CC	1
3187_17492	1	Yes	1
3188_12663	0	NC	-1
3189_07247	0	NC	-1
3190_06390	1	Yes	1
3190_06574	0	e CC	1
3190_15134	0	e CC	1
3191_03827	1	Yes	1
3192_00661	0	NC	-1
3192_03435	2	Yes	1
3193_01361	2	Yes	1
3193_08740	0	NC	1
3193_10233	1	Yes	-1
3193_27298	1	Yes	1
3194_11316	1	Yes	1
3194_15560	2	Yes	1
3194_17379	1	Yes	-1
3194_17570	1	Yes	-1
3202_24917	0	NC	-1
3219_12108	1	Yes	1
3219_14317	1	Yes	1
3221_03597	1	Yes	1
3222_46432	1	Yes	1
3225_12105	1	Yes	1
3226_05662	0	NC	1
3229_17034	1	Yes	1
3235_06686	0	NC	1
3235_14090	1	Yes	1

3235_19061	0	muon CC	1
3236_08794	0	NC	1
3236_20896	1	Yes	1
3236_23780	2	Yes	1
3237_15875	1	Yes	1
3240_04338	1	Yes	1
3241_12143	2	Yes	1
3241_18363	2	Yes	0
3242_07721	1	Yes	1
3244_07138	1	Yes	1
3245_08175	1	Yes	1
3245_08659	1	Yes	1
3245_24598	2	Yes	1
3246_04975	0	NC	1
3247_12334	0	muon CC	1
3248_00500	0	e CC	-1
3248_01045	0	NC	1
3248_23101	1	Yes	1
3253_12208	2	Yes	1
3254_01397	2	no	1
3255_03972	1	no	1
3255_09731	1	Yes	-1
3255_20879	0	NC	-1
3256_04423	0	NC	-1
3257_16624	1	no	0
3257_19107	0	NC	-1
3258_15970	1	Yes	-1
3258_17018	1	Yes	-1
3259_10573	0	NC	1
3260_00789	2	Yes	1
3260_07529	2	Yes	1
3260_13030	1	Yes	-1
3262_23394	2	Yes	1
3266_05254	2	no	-1
3267_07975	0	NC	-1
3267_11739	0	NC	1
3273_10082	0	NC	1
3273_14030	0	NC	-1
3277_18643	1	no	-1
3278_26295	0	NC	1
3280_06894	1	Yes	-1
3282_15665	2	no	1
3283_05257	0	NC	1
3283_12639	1	Yes	-1
3284_00858	2	no	1

3285_01989	1	Yes	1
3287_24160	2	Yes	1
3288_23014	1	Yes	1
3292_17220	2	Yes	1
3296_18816	0	NC	1
3307_02318	1	Yes	1
3317_00693	0	e CC	1
3317_15682	0	NC	1
3330_19742	0	NC	1
3331_12702	1	Yes	1
3331_26460	2	Yes	1
3333_29559	-1		-1
3334_18254	-1		1
3334_19920	0	NC	1
3335_02658	0	e CC	1
3335_05448	1	Yes	-1
3336_11582	0	e CC	1
3337_04750	1	Yes	0
3340_04627	1	Yes	1
3340_11208	0	e CC	0
3340_15043	1	Yes	1
3345_04845	2	Yes	1
3345_05091	0	NC	-1
3345_22440	1	Yes	1
3345_22914	1	Yes	-1
3350_04291	0	NC	0
3351_10047	-1		-1
3351_18516	1	Yes	0
3351_24535	1	no	-1
3352_25371	1	Yes	-1
3352_26934	1	Yes	0
3353_09333	1	Yes	1
3353_29125	1	Yes	1
3355_16733	0	NC	1
3356_03543	1	Yes	1
3356_21803	2	Yes	1
3357_12249	1	Yes	1
3357_30656	-1		-1
3359_08681	2	Yes	1

Gina and Byron generated the “TYPE” column using an eye scan. The ANN column is an independent attempt by Niki and George to classify the event type using a neural network

. A description of the technique is given in an attached document. The following table is a comparison between the event classification of Byron/Gina and the ANN.

For the 100 ν_μ events:

Event Type	Gina/Byron	ANN
ν_μ	100	91
$\nu_.$	N/A	5
NC	N/A	4

For the 39 $\nu_.$ events:

Event Type	Gina/Byron	ANN
ν_μ	N/A	3
$\nu_.$	39	33
NC	N/A	3

For the 74 events classified as TYPE =0 by Gina/Byron:

Event Type	ANN
ν_μ	4
$\nu_.$	18
NC	52

Eight events have emulsion information available but we were unable to locate the primary vertex . The following table summarizes the status of these events.

EVENT	COMMENTS
3121_32288	Visible Energy < 2 GeV
3241_18363	
3257_16624	
3337_04750	
3340_11208	
3350_04291	
3351_18516	
3352_26934	

Interesting Events – Decay Candidates Phase I and II:

EVENT	Data Set	TYPE	Comments	ANN4 (2σ) Classification	Minnesota Parameter Analysis
3263_25102	I	1	kink	0.1	
3024_30175	I	1	Kink-electron	1.0	
3039_01910	I	1	kink	1.0	
3333_17665	I	1	Kink-electron, parent not seen	1.0	
3334_19920	II	1	trident	N/A	0.92
3182_10057	II	1	Kink- from ANN only	0.7	
3296_18816	II	1	trident	N/A	0.02
3356_17099	II	1	Kink, parent not seen	N/A	
			Charm Events??		

TYPE- 1: Tau, 2: Charm

What is the status of the decay search on the Phase II events? Are we finished? –Bruce, Niki,Emily?

Backgrounds:

Backgrounds can be calculated in two ways: One is to calculate the number of background events expected in our sample of tau interactions. This what was done in our first observation paper. The second is to calculate , on an event-by-event basis, the probability that the event is a tau, charm, or a hadronic scatter/interaction. This was done using two independent methods: The Minnesota Parameter Analysis and the Athens Neural Network. The two attached documents describe in detail the two procedures. We feel that the next tau paper should include background estimates from all three methods.