



Set 1.A: 3 Dipole, Asynchronous (10 ms), 4mm², ~30 nAm Strengths

SET 1.A: 3 Asynchronous Sources (4mm²), 30 nAm

Actual Locations



Estimated Locations



SET 1A		Area	V1			Area	a V3		Intraparietal Sulcus (IPS)				
	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	
Actual Locations	-8.23	0.25	4.12		-7.0	.59	7.58		-2.21	3.83	8.26		
No Noise	-8.23	0.21	4.10	.04	-6.95	.60	7.58	.05	-2.21	3.83	8.28	.02	
(SDev)													
Real Noise	-8.18	0.09	4.13	.17	-6.64	0.60	7.39	.41	-2.07	3.90	7.55	.73	
(SDev)	.007	.005	.005		.016	.009	.016		.008	.013	.012		

Set 1A consists of 3 Asynchronous sources, patches 4 mm² and source strengths are 30 nAm. A 4-Dipole solution best characterized this data set (light blue source in nose has come through in all fits to the data—it must represent an artifact within the spontaneous data).



Set 1.B: 3 Dipole, Asynchronous (10 ms), 20mm², ~50 nAm Strengths



Set 1B—3 Asynchronous Sources, 10 ms Apart, ~50 nAm Strengths

SET 1B		Area	V1			Area	V2/V3		Intraparietal Sulcus (IPS)					
	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)		
Actual Locations	-8.23	0.25	4.12		-7.00	0.59	7.58		-2.21	3.83	8.26			
No Noise	-8.23	0.21	4.10	.03	-6.95	0.60	7.58	.05	-2.21	3.83	8.26	.01		
(SDev)	0	0	0		0	0	0		0	0	0			
White Noise 10	-8.23	0.22	4.11	.03	-6.95	0.61	7.59	.05	-2.21	3.83	8.27	.01		
(SDev)	0	.005	.005		.006	.005	.005		.003	.004	.004			
White Noise	-8.23	0.21	4.11	.03	-6.95	0.61	7.59	.05	-2.20	3.83	8.26	.03		
Match (SDev)	.003	.005	.005		.005	.004	.01		.005	.008	.008			
Real Noise	-8.24	0.15	4.12	.10	-6.88	0.62	7.48	.16	-2.12	3.90	7.90	.36		
(SDev)	.006	.005	.003		.009	.005	.008		.004	.005	.006			

Set 1B consists of 3 asynchronous sources (10 ms apart), consisting of patches of 20mm² each, and 50 nAm strengths. Top row reveals actual source locations. The second row reveals solutions (average of 10 best-fitting solutions) for the no noise condition. Two levels of white noise were examined: 1) white noise 10 = white noise at 10 SDev and 2) white noise match = the white noise level matched the level of noise for the real noise condition. For the Real Noise condition, 100 trials of real spontaneous noise were averaged together and added to the signals. White Noise 10 and White Noise Match conditions yielded very similar results which were better than the Real Noise Condition. But, even the Real Noise Condition yielded errors well under 0.5 cm. Since there is very little difference in errors between White Noise 10 and White Noise Match, White Noise 10 will be discarded in future simulations. The artifactual source located within the nose is evident again in the 4-dipole model.



Set 2: Three Sources, Two Synchronous, 1/2 amplitude, Focal Sources (4mm²)



Set 2: 3 Dipole, Two Synchronous, One is 1/2 Amplitude, 4mm², ~30 nAm

Latency (ms)

SET 2: 3-Source, Two Synchronous, One is ¹/₂ Amplitude of the Other, 4mm², 30 nAm



5-Dipole Solution



SET 2		Area	V3			Area	l. LOG		Intraparietal Sulcus (IPS)				
	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	
Actual Locations	-7.0	0.59	7.58		-5.97	3.32	4.29		-2.21	3.83	8.26		
No Noise	-6.97	0.60	7.59	.03	-5.98	3.33	4.29	.01	-2.21	3.82	8.27	.01	
(SDev)													
Real Noise	-5.77	39	5.47	2.45	-5.84	3.57	4.36	.29	-2.13	3.66	7.65	.64	
(SDev)	.019	.027	.014		.009	.013	.011		.009	.016	.016		
Set 2 consist	o of 2 oou		achronou			hich hoco		aronoual		hu notoh	$aa 4 mm^2$	and aquiraa	

Set 2 consists of 3 sources, Asynchronous early activity which becomes synchronous late activity, patches 4 mm² and source strengths are 30 nAm. Light blue sources were localized as well. These 2 extra sources were evident in many of the higher-order fits to real noise.







SET 3.A: 3-Source, Early Asynchronous, Late Synchronous Activity (4mm², 30nAm)



	Area	V1			Area	a V3		Intraparietal Sulcus (IPS)				
Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	
-8.23	0.25	4.12		-7.0	.59	7.58		-2.21	3.83	8.26		
-8.23	0.21	4.10	.04	-6.95	.60	7.58	.05	-2.21	3.83	8.28	.02	
-8.17	0.12	4.14	.14	-6.65	0.64	7.31	.44	-2.10	3.96	7.71	.58	
.005	.004	.005		.011	.005	.020		.006	.007	.01		
	X -8.23 -8.23 -8.17 .005	Area X Y -8.23 0.25 -8.23 0.21 -8.23 0.21 -8.23 0.21 -8.23 0.21 -8.23 0.21 0.001 0.12 0.005 0.004	Area V1 X Y Z -8.23 0.25 4.12 -8.23 0.21 4.10 -8.23 0.21 4.10 -8.23 0.21 4.10 -8.23 0.21 4.10 -8.23 0.21 4.10 -8.23 0.21 4.10 -8.23 0.21 4.10	Area V1 X Y Z Error (cm) -8.23 0.25 4.12	Area V1 X Y Z Error (cm) X -8.23 0.25 4.12 -7.0 -8.23 0.25 4.12 -7.0 -8.23 0.21 4.10 0.4 -6.95 -8.23 0.21 4.10 .04 -6.95 -8.23 0.21 4.14 .14 -6.65 .005 .004 .005 .011	Area V1AreaXYZError (cm)XY-8.23 0.25 4.12 -7.0 $.59$ -8.23 0.21 4.10 $.04$ -6.95 $.60$ -8.23 0.21 4.10 $.04$ -6.95 $.60$ -8.23 0.21 4.10 $.04$ -6.65 0.64 -8.17 0.12 4.14 $.14$ -6.65 0.64 .005 $.004$ $.005$ $.011$ $.005$	Area V1Area V3XYZError (cm)XYZ-8.230.254.12-7.0.597.58-8.230.214.10.04-6.95.607.58-8.230.214.10.04-6.95.607.58-8.230.214.10.04-6.95.607.58-8.170.124.14.14-6.650.647.31.005.004.005I.011.005.020	Area $\forall I$ Area $\forall I$ Z $Error (cm)$ X Y Z $Error (cm)$ X Y Z $A.12$ $C.02$ $A.12$ -7.0 $.59$ 7.58 $C.02$ -8.23 0.25 4.12 I I I I I I -8.23 0.21 4.10 $.04$ -6.95 $.60$ 7.58 $.05$ -8.23 0.21 4.10 $.04$ -6.95 $.60$ 7.58 $.05$ -8.17 0.12 4.14 $.14$ -6.65 0.64 7.31 $.44$ $.005$ $.004$ $.005$ I $.011$ $.005$ $.020$ I	Area $\forall I$ Area $\forall I$ Area $\forall J$ Area $d J$	Area V1Area V3Image: Image: Im	Area VI Area V3 Interpretent Sultation X Y Z Error (cm) X Y Z	

Set 3A consists of 3 sources, patches 4 mm² and source strengths are 30 nAm. The difference between this set and Set 1B is that the early portion of activity is asynchronous while later activity (400-600 ms) is synchronous. This condition is often seen in attention or working memory studies, where late activity becomes synchronized. It is interesting to note that errors are larger in this condition compared to Set 3B but they are still less than .6 cm.



Set 3.B: 3 Dipole, Early Asynchronous, Late Synchronous, 20mm², ~50 nAm

SET 3.B: 3-Source, Early Asynchronous, Late Synchronous Activity (20mm², 50nAm)

Actual Locations

Estimated Locations





SET 3B		Area	V1			Area	V2/V3		Intraparietal Sulcus (IPS)				
	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	Х	Y	Z	Error (cm)	
Actual Locations	-8.10	0.43	4.25		-6.87	0.56	7.39		-2.29	3.85	8.29		
No Noise	-7.99	0.51	4.30	.14	-6.72	0.77	7.60	.33	-2.03	3.86	8.40	.28	
(SDev)	0	.003	0		0	0	0		0	.004	0		
Real Noise	-7.96	0.46	4.32	.16	-6.54	0.87	7.55	.48	-2.05	4.03	8.16	.27	
(SDev)	.006	.005	0		.007	.006	.007		.004	.004	.004		

Set 3B consists of 3 sources, patches 20 mm² and source strengths are 50 nAm. The difference between this set and Set 1B is that the early portion of activity is asynchronous while later activity (400-600 ms) is synchronous. This condition is often seen in attention or working memory studies, where late activity becomes synchronized. It is interesting to note that errors are larger in this condition compared to Set 1B but they are still less than .5 cm.



Set 4: Six Dipole Activity (4mm²)— Simulates Visual Working Memory



Set 4: 6-Dipole (noiseless) -- Actual Timecourses for each Cortical Patch

SET 4: 6 Sources – Visual Working Memory



SET 4		Dipole V3		Error	Di	ipole I. LC)G	Error	Dipole IPS			Error
	X	Y	Z		Х	Y	Z		Х	Y	Z	
Actual	-7.0	0.59	7.58		-5.97	3.32	4.29		-2.21	3.83	8.26	
No Noise	-6.97	.60	7.59	.03	-5.98	3.33	4.29	.01	-2.21	3.82	8.27	.01
Real Noise	-6.13	.43	7.41	.90	-5.56	3.17	4.45	.46	-1.87	2.87	7.18	1.48
SDev	.029	.234	.160		.165	.026	.038		.153	.168	.090	
	Dipo	ole R. Fror	ntal			Dipole AC	2		R. Sup LOG			
	X	Y	Z		Х	Y	Z		Х	Y	Z	
Actual	5.81	-4.15	4.62		7.41	70	4.78		-3.13	-4.07	6.03	
No Noise	5.81	-4.17	4.62	.01	7.40	71	4.76	.02	-3.14	-4.08	6.03	.01
Real Noise	5.85	-4.32	4.40	.28	7.26	99	4.67	.34	-2.75	-3.61	5.91	.61
SDev	.014	.009	.043		.047	.026	.018		.049	.061	.063	



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Set 5: 7-Dipole Simulated Visual Working Memory Data

SET 5: 7 Sources – Visual Working Memory



SET 5 7 Sources	Dipole L. V3			Err or	Dipole L. I. LOG			Er ror	Dipole IPS			Err or	Dipole R. S. LOG		Error	
Actual	Х	Y	Z		Х	Y	Z		Х	Y	Z		Х	Y	Z	
	-7.0	0.59	7.58		-5.97	3.32	4.29		-2.21	3.83	8.26		-3.13	-4.07	6.03	
No Noise	-6.98	.60	7.59	.02	-5.98	3.33	4.29	.01	-2.21	3.82	8.27	.01	-3.14	-4.08	6.03	.01
Real Noise	-5.61	.07	7.51	1.49	-5.52	3.33	4.45	.48	-1.92	2.66	7.18	1.62	-2.66	-3.28	5.60	1.01
SDev	.150	.056	.052		.07	.057	.02		.04	.060	.060		.121	.162	.083	
	Dipol	e R. Fro	ontal		D	ipole AC	2		Dipo	ole R. H	ірро					
	Х	Y	Z		Х	Y	Z		Х	Y	Z		Х	Y	Z	
	5.81	-4.15	4.62		7.41	70	4.78		0.02	-2.39	2.55					
No Noise	5.81	-4.18	4.61	.03	7.40	71	4.76	.02	.01	-2.37	2.56	.02				
Real Noise	5.87	-4.31	4.44	.25	7.24	10	4.67	.36	.50	-2.49	6.20	3.68				
SDev	.018	.024	.032		.058	.042	.033		.112	.05	.044					
Locations (cn	n), Stano	dard De	viations	s (cm),	and Erro	ors (cm)	for SE	Т 5.								