Corrigenda

to the doctoral dissertation

Modulation of Visual Information Processing in the Human Nervous System Using Non-Invasive Electrical Stimulation

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Contents

Revised formulas

Page 62, line 6

before	after
$Q_{area} = \frac{I_{RMS} \times t_{half-phase}}{A}$	$Q_{pulse} = 2 \cdot \int_{0}^{t_{half-phase}} I_{peak} \cdot sin(2\pi ft)dt = \frac{2I_{peak}}{\pi f}$
	$Q_{area} = Q_{pulse} \div A$

Rationale: The initially applied method of charge calculation, based on the root mean square (RMS), reflects the effective value but does not account for the actual charge flow during the duration of a sinusoidal pulse. The revised approach integrates the pulse function over time, providing a more accurate representation of total charge (see Corrigendum Table 1).

Page 66, line 33; page 67, line 4

before	$\sigma_{eyeballs} = \frac{\left(W_{vitreous\ humor} \times \sigma_{vitreous\ humor}\right) + \left(W_{other} \times \sigma_{other}\right)}{2}$
	$\sigma_{eyeballs} = \frac{(0.8 \times 2.16\ S/m) + (0.2 \times 0.6835\ S/m)}{2} = 0.9323\ S/m$
after	$\sigma_{eyeballs} = \left(W_{vitreous\ humor} \times \sigma_{vitreous\ humor}\right) + \left(W_{other} \times \sigma_{other}\right)$
	$\sigma_{eyeballs} = (0.8 \times 2.16\ S/m) + (0.2 \times 0.6835\ S/m) = 1.8647\ S/m$

Rationale: Correction of a weighted average equation. Incorporating this change resulted in an increase (x2) of eyeballs conductivity and subtle changes in modeling results (see Tables and updated Figures below).

Page 83, line 6

before	after
$f(d,A) = r_{max} + r_{base}\left(\frac{Q(d,A)^n}{Q(d,A)^n + \sigma_Q^n}\right)$	$f(d,A) = r_{base} + r_{max}\left(\frac{Q(d,A)^n}{Q(d,A)^n + \sigma_Q^n}\right)$

Rationale: Swapping the r_{max} and r_{base} parameters.

Page 126, line 20

before	$f(d,A) = r_{max} + r_{base}\left(\frac{Q(d,A)^n}{Q(d,A)^n + \sigma_Q^n}\right)\left(\frac{A^m}{A^m + \sigma_A^m}\right)\left(\frac{\delta^p}{\delta^p + d^p}\right)$
after	$f(d,A) = r_{base} + r_{max}\left(\frac{Q(d,A)^n}{Q(d,A)^n + \sigma_Q^n}\right)\left(\frac{A^m}{A^m + \sigma_A^m}\right)\left(\frac{\delta^p}{\delta^p + d^p}\right)$

Rationale: Swapping the r_{max} and r_{base} parameters.

Page 105, line 27

before	after
$I_{total} = \sum_{i=1}^{N_{vox}} I_{vox} = \sum_{i=1}^{N_{vox}} \left(magnJ_i \times A_{vox} \right)$	The I_{total} measure and it's formula has been removed from the dissertation.

Rationale: The introduction of the I_{total} measure, which sums current flowing through all voxels of a given anatomical structure, was intended as a practical way to highlight the relationship between a structure's size and the total amount of current passing through it. The aim was to draw attention to the fact that large structures (e.g., scalp), even with low current density, could conduct equal or greater total current compared to smaller regions with high current density (e.g., the eyeballs). However, the I_{total} measure lacks physical justification - it is based on summing absolute current values and does not account for the directionality of the current density vector or charge conservation. As a result, it leads to mathematical overaccumulation and obscures the distinction between real current flow and geometric accumulation of density. For this reason, the corrigendum removes this measure from further use. In its place, the number of voxels comprising each structure/ROI is reported, which allows for better normalization of average EFM and CDM values to the actual volume of the analyzed region, reducing the risk of overinterpretation and exaggeration of regional significance or the current flowing through it.

The source code, reflecting changes of the equations, is available at:
https://github.com/piotrdzwiniel/nencki_phd/tree/master/src/corrigenda.

Revised values

This section presents the recalculated results after corrections to the above formulas were implemented. The updated computations include values of total charge for current pulses, parameters and predictions of the Naka-Rushton models, as well as values of the induced electric field. The corrected values have also been incorporated into the subsequent sections dedicated to text, tables, and figures in the dissertation.

Corrigendum Table 1. *Comparison of total charge (Q_{pulse}) values for pulses of specified duration and amplitude, calculated using the root mean square (RMS, before correction) and integral-based (after) methods.*

Pulse Parameters	Before	After	Difference (%)
10 ms 100 µA	0.3536 µC	0.3183 µC	9.98
10 ms 200 µA	0.7071 µC	0.6366 µC	9.97
10 ms 300 µA	1.0607 µC	0.9549 µC	9.97
50 ms 100 µA	1.7678 µC	1.5915 µC	9.97
50 ms 200 µA	3.5355 µC	3.1831 µC	9.97
50 ms 300 µA	5.3033 µC	4.7746 µC	9.97
100 ms 100 µA	3.5355 µC	3.1831 µC	9.97
100 ms 200 µA	7.0711 µC	6.3662 µC	9.97
100 ms 300 µA	10.6066 µC	9.5493 µC	9.97

Corrigendum Table 2. *Comparison of Naka-Rushton model parameter estimates obtained with initially used RMS-based (before) versus updated integral-based (after) pulse charge calculations. The table includes results from one-dimensional (1D) and three-dimensional (3D) model fits for behavioral data from the first study, and three-dimensional model fits for EEG data from the second study.*

Param.	Description	1D First Study		3D First Study		3D Second Study	
		Before	After	Before	After	Before	After
r_max	Maximum response level, representing the upper bound of the model (asymptote).	89.7117	89.8717	148.1112	191.3033	93.3224	90.6216
sigma_Q	Half-saturation constant for total charge (Q); the charge level at which the response reaches 50% of r_max.	1.5385	1.3851	7.9801	1.2701	4.7580	0.8913
n	Hill coefficient for total charge; controls the steepness of the response curve related to total charge.	7.9742	7.9743	11.1811	11.1827	1.4026	4.3575
sigma_A	Half-saturation constant for pulse amplitude (A); the amplitude level at which the response reaches 50% of r_max.	N/A	N/A	65.5224	65.5224	93.6687	82.0661
m	Hill coefficient for amplitude; controls the steepness of the response curve related to amplitude.	N/A	N/A	2.7862	2.7862	20.2654	3.7853
delta	Scaling constant for duration effectiveness.	N/A	N/A	0.0048	57.7021	15.0085	19.8739
p	Hill coefficient for duration effectiveness; controls how duration influences the response.	N/A	N/A	-0.064	-0.0452	-2.3460	-1.7789
r_base	Baseline response (minimum response level); the lowest possible response level when stimulation is minimal.	0.5590	0.5591	0.8596	0.8596	-5.4768	-0.3437
R^2	Goodness of fit	0.9797	0.9797	1.0000	1.0000	0.9948	0.9952

Corrigendum Table 3. *Predicted pulse durations (in ms) required to reach selected phosphene detection levels for specific current amplitudes. Results are based on the* ***one- and three-dimensional Naka-Rushton model*** *fitted to behavioral data from the first study. Values are shown for RMS-based (before) and updated integration-based (after) charge calculations.*

Detection Level	Pulse amplitude (μA)	Duration (ms)			
		One-dimensional Naka-Rushton model		*Three-dimensional Naka-Rushton model*	
		Before	After	Before	After
90%	300	28.54	28.54	18.37	18.35
90%	200	42.42	42.42	29.86	29.84
90%	100	83.24	83.24	NaN	NaN
50%	300	14.99	14.99	13.6	13.60
50%	200	22.31	22.31	20.26	20.26
50%	100	43.70	43.70	41.54	41.54
5%	300	10.06	10.06	10.15	10.15
5%	200	14.98	14.98	15.25	15.25
5%	100	29.48	29.48	30.42	30.42

Corrigendum Table 4. *Predicted pulse durations (in ms) required to reach P2 amplitude level, defined as 75%, 50% or 10% of the response evoked by a visual stimulus (LED), for specific current amplitudes. Results are based on the* ***three-dimensional Naka-Rushton*** *model fitted to EEG data from the second study. Values are shown for both RMS-based (before) and updated integration-based (after) charge calculations.*

Percent of Response to Visual Stimulus	Amplitude (μA)	Duration (ms)	
		Before	After
75%	300		50.12
75%	200		55.76
75%	100		NaN
50%	300	22.93	23.32
50%	200	26.36	25.84
50%	100	51.32	51.99
10%	300	10.13	NaN
10%	200	11.36	12.60
10%	100	15.91	22.41

Corrigendum Table 5. *Maximum EFM and CDM values in selected regions of interest (ROIs) before and after the correction of eye conductivity values for the "periorbital" electrode montage. The values are presented for both surface simulation outputs (mesh; .msh files) and data exported to the voxel format (voxel; NIfTI files). For each method and format, values before and after the correction are shown, along with the corresponding percent change.*

ROI	Measure	Before		After		Difference (%)	
		msh (mesh)	nii (voxel)	msh (mesh)	nii (voxel)	msh (mesh)	nii (voxel)
Scalp	EFM	1.7667	1.1187	1.7876	1.1292	1.1864	0.9404
	CDM	0.3445	0.2182	0.3486	0.2202	1.1864	0.9397
Eyeballs	EFM	0.0844	0.0779	0.0482	0.0444	-42.8830	-43.0222
	CDM	0.0787	0.0726	0.0899	0.0828	14.2954	14.0102
GM	EFM	0.0225	N/A	0.0220	N/A	-2.5640	N/A
	CDM	0.0094	N/A	0.0092	N/A	-2.5640	N/A
WM	EFM	0.0749	N/A	0.0704	N/A	-5.8939	N/A
	CDM	0.0260	N/A	0.0245	N/A	-5.8938	N/A
Optic Nerve	EFM	N/A	0.0375	N/A	0.0352	N/A	-6.1050
	CDM	N/A	0.0131	N/A	0.0123	N/A	-6.0536
Rest of the Brain	EFM	N/A	0.0244	N/A	0.0186	N/A	-24.0066
	CDM	N/A	0.0085	N/A	0.0078	N/A	-8.5882

Corrigendum Table 6. *Volumetric statistics of electric field magnitude (EFM) in selected regions of interest (ROIs) after correction of eyeball conductivity for the "periorbital" electrode configuration. The table represents a corrected version of* ***Table 3-1****, supplemented with the column "% Change", which indicates the percentage change in mean EFM values after correction relative to the values before correction.*

Volume	Electric Field Magnitude [V/m]					Voxel Count
	Mean	Difference (%)	SD	Max	Min	
Scalp	0.0047	-1.6842	0.0255	1.1292	0.0000	1.22E+07
Eyeballs	0.0281	-42.5971	0.0061	0.0444	0.0145	17542
Optic Nerve	0.0092	-9.8522	0.0035	0.0352	0.0047	1637
Rest of the Brain	0.0034	-2.6087	0.0018	0.0186	0.0000	1638915

Corrigendum Table 7. *Volumetric statistics of current density magnitude (CDM) in selected regions of interest (ROIs) after correction of eyeball conductivity for the "periorbital" electrode configuration. The table represents a corrected version of* ***Table 3-2****, supplemented with the column "% Change", which indicates the percentage change in mean CDM values after correction relative to the values before correction.*

Volume	Current Density Magnitude [A/m2]					Voxel Count
	Mean	Difference (%)	SD	Max	Min	
Scalp	0.0009	-2.1505	0.0050	0.2202	0.0000	1.22E+07
Eyeballs	0.0524	14.8782	0.0113	0.0828	0.0061	17542
Optic Nerve	0.0032	-9.9150	0.0012	0.0123	0.0016	1637
Rest of the Brain	0.0013	-3.0075	0.0007	0.0078	0.0000	1638915

Corrigendum Table 8. *Maximum EFM and CDM values in selected regions of interest (ROIs) before and after the correction of eye conductivity values for the "frontal-occipital" electrode montage. The values are presented for both surface simulation outputs (mesh; .msh files) and data exported to the voxel format (voxel; NIfTI files). For each method and format, values before and after the correction are shown, along with the corresponding percent change.*

ROI	Measure	Before		After		Difference (%)	
		msh (mesh)	nii (voxel)	msh (mesh)	nii (voxel)	msh (mesh)	nii (voxel)
Scalp	EFM	1.6173	1.0695	1.6223	1.0726	0.3092	0.2955
	CDM	0.3154	0.2086	0.3163	0.2092	0.3095	0.2925
Eyeballs	EFM	0.0797	0.0936	0.0443	0.1041	-44.3525	11.2667
	CDM	0.0743	0.0688	0.0827	0.0772	11.3548	12.1820
GM	EFM	0.0666	N/A	0.0673	N/A	1.0031	N/A
	CDM	0.0279	N/A	0.0282	N/A	1.0029	N/A
WM	EFM	0.2389	N/A	0.2445	N/A	2.3567	N/A
	CDM	0.0831	N/A	0.0851	N/A	2.3571	N/A
Optic Nerve	EFM	N/A	0.1462	N/A	0.1493	N/A	2.1269
	CDM	N/A	0.0509	N/A	0.0520	N/A	2.1423
Rest of the Brain	EFM	N/A	0.0951	N/A	0.1076	N/A	13.1413
	CDM	N/A	0.0331	N/A	0.0375	N/A	13.1420

Corrigendum Table 9. *Volumetric statistics of electric field magnitude (EFM) in selected regions of interest (ROIs) after correction of eyeball conductivity for the "frontal-occipital" electrode configuration. The table represents a corrected version of* ***Table 3-3****, supplemented with the column "% Change", which indicates the percentage change in mean EFM values after correction relative to the values before correction.*

Volume	Electric Field Magnitude [V/m]					Voxel Count
	Mean	Difference (%)	SD	Max	Min	
Scalp	0.0062	0.0000	0.0253	1.0726	0.0000	1.22E+07
Eyeballs	0.0198	-43.8244	0.0054	0.1041	0.0098	17542
Optic Nerve	0.0414	1.7949	0.0294	0.1493	0.0067	1637
Rest of the Brain	0.0096	-0.3115	0.0022	0.1076	0.0000	1638915

Corrigendum Table 10. *Volumetric statistics of current density magnitude (CDM) in selected regions of interest (ROIs) after correction of eyeball conductivity for the "frontal-occipital" electrode configuration. The table represents a corrected version of* ***Table 3-4****, supplemented with the column "% Change", which indicates the percentage change in mean CDM values after correction relative to the values before correction.*

Volume	Current Density Magnitude [A/m2]					Voxel Count
	Mean	% Change	SD	Max	Min	
Scalp	0.0012	0.0000	0.0049	0.2092	0.0000	1.22E+07
Eyeballs	0.0370	12.4012	0.0100	0.0772	0.0182	17542
Optic Nerve	0.0144	1.8375	0.0102	0.0520	0.0023	1637
Rest of the Brain	0.0037	-0.2703	0.0009	0.0375	0.0000	1638915

Text revisions

The result description in the text also requires few corrections i.e. introduction of revised values:

Page	Line	Before	After
7	9	…**stężenia** indukowanego pola elektrycznego…	…**natężenia** indukowanego pola elektrycznego…
9		gamma-aminobutyric acid (neurotransmitter)	gamma-aminobutyric acid
62	16	…determined to be **1.77** μC. When distributed over an electrode area of 3 cm², the total charge per unit area is approximately **0.59** μC/cm²…	…determined to be **1.59** μC. When distributed over an electrode area of 3 cm², the total charge per unit area is approximately **0.53** μC/cm²…
62	26	…(**0.00448** C/cm² vs. 0.022 C/cm²).	…(**0.00804** C/cm² vs. 0.022 C/cm²).
66	28	…a value of **0.9323** S/m for the eyeballs parameter. This is almost **double** the default value in SimNIBS software, which is 0.5 S/m.	…a value of **1.8646 S/m** for the eyeballs parameter. This **is** almost **four times higher** than the default value in SimNIBS software, which is 0.5 S/m.
96	13	…the maximum electric field magnitude (EFM) value for the ellipsoidal electrode was **1.7609 V/m²**, as compared to **1.7667** V/m for the rectangular electrode.	…the maximum electric field magnitude (EFM) value for the ellipsoidal electrode was **1.7680 V/m**, as compared to **1.7876** V/m for the rectangular electrode.
96	20	…(KS = **0.389**, p-value = **0.332**).	…(KS = **0.064**, p-value = **0.213**).
97	1	…observed for the ellipsoidal electrode (**1.7609** V/m), …	…observed for the ellipsoidal electrode (**1.7680** V/m), …
97	16	…(KS = **0.109**, p-value = **0.003**).	…(KS = **0.090**, p-value = **0.025**).
97	17	For the **0.6-1.0 range**, [...] (**KS = 0.638**, **p-value = 0.010**).	For the **0.5-1.0 range**, [...] (**KS = 0.412**, **p-value = 0.002**).
99	9	The maximum field values were **0.786** V/m and **0.755** V/m for the rectangular and ellipsoid electrodes, respectively **- 2.25** and **2.33** times lower than those observed with smaller electrodes of corresponding shapes.	The maximum field values were **0.700** V/m and **0.869** V/m for the rectangular and ellipsoid electrodes, respectively **- 2.55** and **2.03** times lower than those observed with smaller electrodes of corresponding shapes.

99	15	…(KS = **0.128**, p-value < **0.001**; [...]).	…(KS = **0.136**, **p-value < 0.001**; [...]).
99	16	…range (**0.5-1.0**), [...] (KS = **0.393**, p-value = **0.009**)...	…range (**0.4-1.0**), [...] (KS = **0.317**, p-value = **0.007**)...
102	20	The value observed on the surface of the eyeballs was **0.0844** V/m; **0.0749** V/m in the white matter of the optic nerve and as low as **0.0225** V/m was noted in the gray matter in the anterior cortical region.	The value observed on the surface of the eyeballs was **0.0482** V/m; **0.0704** V/m in the white matter of the optic nerve and as low as **0.0220** V/m was noted in the gray matter in the anterior cortical region.
104	16	…**1.1187** V/m, [...] **14** times higher [...] (**0.0779** V/m).	…**1.1292** V/m, [...] **25** times higher [...] (**0.0444** V/m).
104	17	…**6.96**%...	…**3.93**%...
104	21	…**93**%...	…**96**%...
105	2	…the maximum EFM in the optic nerve reaching only **0.0375** V/m - equivalent to **3.35**% of the scalp maximum…	…the maximum EFM in the optic nerve reaching only **0.0352** V/m - equivalent to **3.12**% of the scalp maximum…
105	3	For the rest of the brain volume the maximum EFM was **0.0244** V/m, or **2.18**% of the scalp maximum…	For the rest of the brain volume the maximum EFM was **0.0186** V/m, or **1.65**% of the scalp maximum…
105	11	…(**0.0489** V/m).	…(**0.0281** V/m).
105	11	This value is nearly **five** times greater than the average EFM in the optic nerve (**0.0102** V/m) and almost **14** times higher than the average EFM in the rest of the brain (**0.0035** V/m). It is also **ten** times greater than the average EFM in the scalp (**0.0048** V/m).	This value is nearly **three** times greater than the average EFM in the optic nerve (**0.0092** V/m) and **8** times higher than the average EFM in the rest of the brain (**0.0034 V/m**). It is also **six** times greater than the average EFM in the scalp (**0.0047** V/m).
106	18	…the maximum CDM on the skin was only **three** times higher than in the eyeballs, measuring **0.2182** A/m^2 for the scalp and **0.0726** A/m^2 for the eyeballs…	…the maximum CDM on the skin was only **2.5** times higher than in the eyeballs, measuring **0.2202** A/m^2 for the scalp and **0.0828** A/m^2 for the eyeballs…
107	1	…**0.0131** A/m^2…	…**0.0123** A/m^2…
107	2	…**0.0085** A/m^2 [...] **0.0456** A/m^2…	…**0.0078** A/m^2 [...] **0.0524** A/m^2…
107	4	…**0.0035** A/m²…	…**0.0032** A/m²…
107	5	…**51** times lower…	…**58** times lower…
109	15	…(**1.6173** V/m)...	…(**1.6223** V/m)...
109	16	…**20** times higher…	…**37** times higher…
109	17	…**0.0797** V/m…	…**0.0443** V/m…
109	18	…**0.2389** V/m…	…**0.2445** V/m…
109	19	…**6.8** times lower [...] **3** times higher…	…**6.6** times lower [...] **5.5** times higher…
109	21	…**0.0666** V/m…	…**0.0673** V/m…

111	1	…**0.0407** V/m…	…**0.0414** V/m…
111	2	…**0.1462** V/m…	…**0.1493** V/m…
111	5	…**1.0695** V/m…	…**1.0726** V/m…
111	7	…**0.0353** V/m…	…**0.0198** V/m…
111	8	…**0.0936** V/m…	…**0.1041** V/m…
111	11	…**0.0951** V/m…	…**0.1076** V/m…
112	13	…Figure **47**…	…Figure **3-18**…
113	12	…**0.2086** A/m^2…	…**0.2092** A/m^2…
113	13	…**0.0329** A/m^2…	…**0.0370** A/m^2…
113	14	…**0.0688** A/m^2…	…**0.0772** A/m^2…
113	15	…**0.0142** A/m^2…	…**0.0144** A/m^2…
113	16	…**0.0509** A/m^2…	…**0.0520** A/m^2…
113	19	…**0.0331** A/m**²**…	…**0.0375** A/m^2…
115	13	…**1.7667** V/m [...] **1.6173** V/m…	…**1.7876** V/m [...] **1.6223** V/m…
115	17	…(**0.2389** V/m) [...] (**0.0666 V/m**)...	…(**0.2445** V/m) [...] (**0.0673** V/m)...
115	19	…(**0.0844** V/m) [...] **0.0797** V/m…	…(**0.0482** V/m) [...] **0.0443** V/m…
117	11	…**0.3445** A/m^2 [...] **0.3154** A/m^2…	…**0.3486** A/m^2 [...] **0.3163** A/m^2…
117	15	…(**0.0787** A/m^2) [...] **0.0743** A/m^2…	…(**0.0899** A/m^2) [...] **0.0827** A/m^2…
117	17	…(**0.0831** A/m^2) [...] (**0.0279** A/m^2)...	…(**0.0851** A/m^2) [...] (**0.0282 A/**m^2)...
119	14	…KS statistic of **0.4775**…	…KS statistic of **0.5219**…
119	16	…KS statistic of **0.6005**…	…KS statistic of **0.6872**…
120	1	…KS statistic of **0.8987**…	…KS statistic of **0.9066**…
120	15	…KS test statistic was **0.4776**…	…KS test statistic was **0.5219**…
120	16	…KS statistic of **0.6005**…	…KS statistic of **0.6872**…
120	17	…KS statistic of **0.8970**…	…KS statistic of **0.9048**…
124	7	…F(9, **70597**) = 2152.22…	…F(9, **70.597**) = 2152.22…
125	16	For 90% responses, the differences were more pronounced, with the three-factor model predicting **18.37** ms for 300 µA (a reduction of **35.63**%) and **29.86** ms for 200 µA (a reduction of **29.63**%).	For 90% responses, the differences were more pronounced, with the three-factor model predicting **18.35** ms for 300 µA (a reduction of **35.70**%) and **29.84** ms for 200 µA (a reduction of **29.66**%).
139	36	…Figure 3-**30**C…	…Figure 3-**28**C…

145	8	…goodness-of-fit R^2 of **0.9948** and an average absolute difference between the actual and predicted values of only **2.22**%.	…goodness-of-fit R^2 of **0.9952** and an average absolute difference between the actual and predicted values of only **1.64**%.
145	14	To achieve a modeled response of 50%, the required pulse durations were **51.32** ms for 100 µA, **26.36** ms for 200 µA, and **22.93** ms for 300 µA.	To achieve a modeled response of 50%, the required pulse durations were **51.99** ms for 100 µA, **25.84** ms for 200 µA, and **23.32** ms for 300 µA.
145	15	For a modeled response of 10%, [...] **15.91** ms for 100 µA, **11.36** ms for 200 µA, and **10.13 ms** for 300 µA.	For a modeled response of 10%, [...] **22.41** ms for 100 µA, **12.69** ms for 200 µA, and **NaN** for 300 µ.
146	21	…**2.22**%...	…**1.64**%...
180	22	…Figure 3-2**6**…	…Figure 3-2**5**…

Revised tables

Page 68, line 1, Table 2-1
Description of changes: the value in the "Eye" row and "Swiss ITIS Foundation" column has been updated to 1.8647 S/m, reflecting the corrected result of the formula used to calculate ocular conductivity.

Page 104, line 1, Table 3-1
Description of changes: Revised values reflecting the updated eye conductivity and the removal of the "Sum" column.

Volume	Electric Field Magnitude [V/m]				Voxel Count
	Mean	SD	Max	Min	
Scalp	0.0047	0.0255	1.1292	0.0000	12,220,000
Eyeballs	0.0281	0.0061	0.0444	0.0145	17,542
Optic Nerve	0.0092	0.0035	0.0352	0.0047	1,637
Rest of the Brain	0.0034	0.0018	0.0186	0.0000	1,638,915

Page 107, line 11, Table 3-2
Description of changes: Revised values reflecting the updated eye conductivity and the removal of the "I_{total}" column.

Volume	Current Density Magnitude [A/m²]				Voxel Count
	Mean	SD	Max	Min	
Scalp	0.0009	0.0050	0.2202	0.0000	12,220,000
Eyeballs	0.0524	0.0113	0.0828	0.0061	17,542
Optic Nerve	0.0032	0.0012	0.0123	0.0016	1,637
Rest of the Brain	0.0013	0.0007	0.0078	0.0000	1,638,915

Page 111, line 14, Table 3-3
Description of changes: Revised values reflecting the updated eye conductivity and the removal of the "Sum" column.

Volume	Electric Field Magnitude [V/m]				Voxel Count
	Mean	SD	Max	Min	
Scalp	0.0062	0.0253	1.0726	0.0000	12,220,000
Eyeballs	0.0198	0.0054	0.1041	0.0098	17,542
Optic Nerve	0.0414	0.0294	0.1462	0.0067	1,637
Rest of the Brain	0.0096	0.0022	0.1076	0.0000	1,638,915

Page 114, line 4, Table 3-4
Description of changes: Revised values reflecting the updated eye conductivity and the removal of the "I_{total}" column.

Volume	Current Density Magnitude [A/m^2]				Voxel Count
	Mean	SD	Max	Min	
Scalp	0.0012	0.0049	0.2092	0.0000	12,220,000
Eyeballs	0.0370	0.0100	0.0772	0.0182	17,542
Optic Nerve	0.0144	0.0102	0.0520	0.0023	1,637
Rest of the Brain	0.0037	0.0009	0.0375	0.0000	1,638,915

Page 116, line 11, Table 3-5
Description of changes: Revised values reflecting the updated eye conductivity.

Configuration	Surface			
	Scalp	Eyeballs	WM	GM
Periorbital	1.7876	0.0482	0.0704	0.0220
Frontal-Occipital	1.6223	0.0443	0.2445	0.0673

Page 118, line 1, Table 3-6
Description of changes: Revised values reflecting the updated eye conductivity.

Configuration	Surface			
	Scalp	Eyeballs	WM	GM
Periorbital	0.3486	0.0899	0.0245	0.0092
Frontal-Occipital	0.3163	0.0827	0.0851	0.0282

Page 129, line 12, Table 3-9
Description of changes: Modifications in the calculation of total pulse charge led to adjustments in model parameters (Corrigendum Table 2), but not in predicted values of valid response rates (%).

Page 146, line 1, Table 3-16
Description of changes: Modifications in the calculation of total pulse charge led to adjustments in model parameters (Corrigendum Table 2) and in the predicted values.

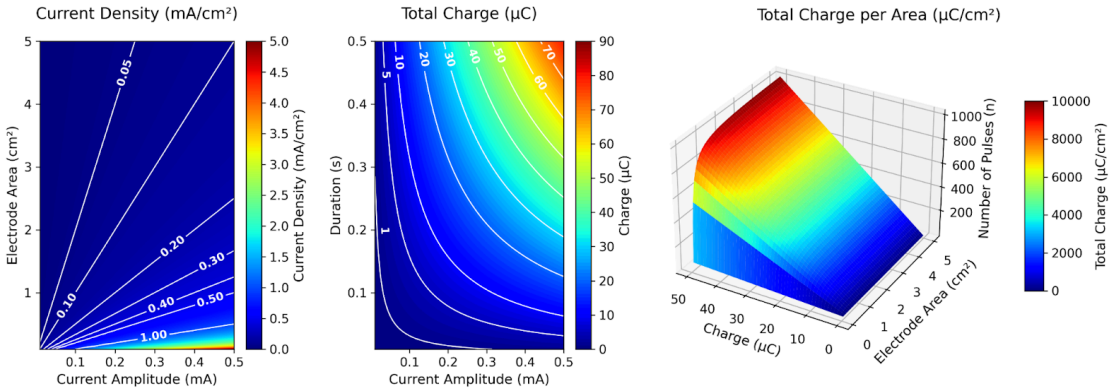
Values	Trial Type								
	10 ms 100 µA	**10 ms 200 µA**	**10 ms 300 µA**	**50 ms 100 µA**	**50 ms 200 µA**	**50 ms 300 µA**	**100 ms 100 µA**	**100 ms 200 µA**	**100 ms 300 µA**
Predictions	-0.19	3.40	11.42	47.37	72.77	74.96	57.65	82.57	84.80
Actual	0.00	3.10	11.51	47.75	69.00	78.38	57.34	85.90	81.77
Difference	-0.19	0.3	-0.09	-0.38	3.76	-3.41	0.31	-3.33	3.03

average absolute difference = 1.64; goodness of fit (R^2) = 0.9952

Revised figures

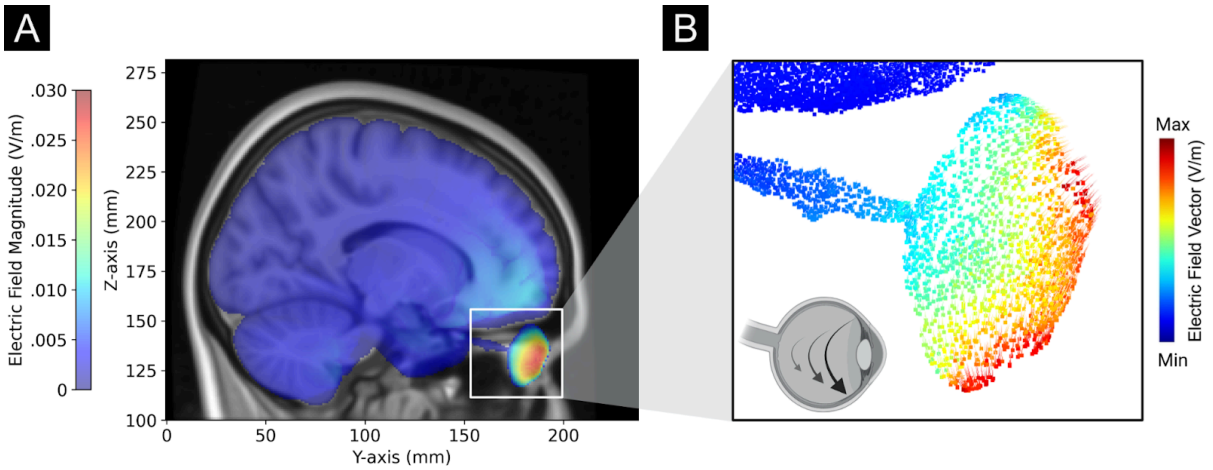
Figure 3-26
Due to an editorial oversight, the figure numbering in *Results* skips Figure 3-26 - the numbering goes from Figure 3-25 directly to Figure 3-27. No figure is actually missing; the issue is limited to the numbering only.

Page 91, line 12, Figure 3-1
Description of changes: Revised figure reflecting the use of integration-based instead of RMS-based pulse total charge calculations.



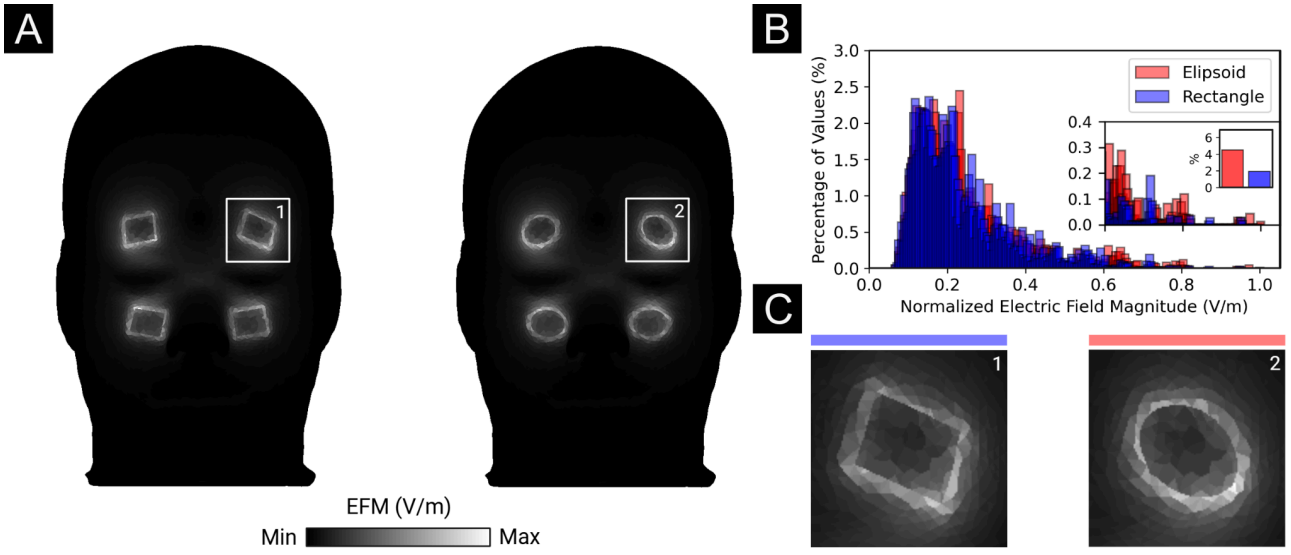
Page 95, line 1, Figure 3-4

Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits.



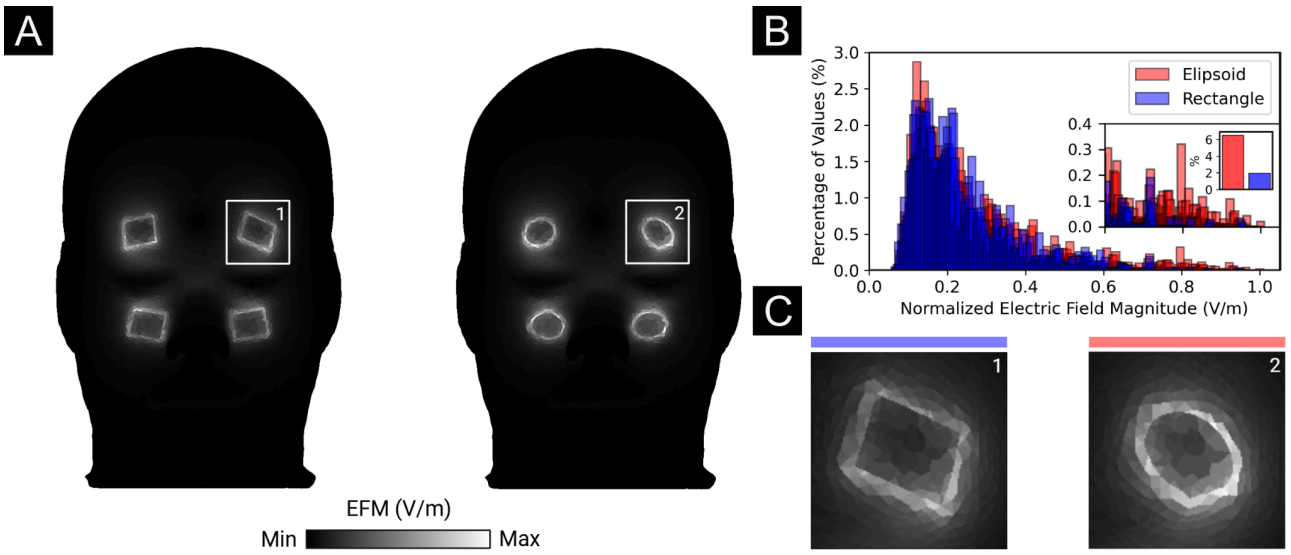
Page 96, line 22, Figure 3-5

Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits.

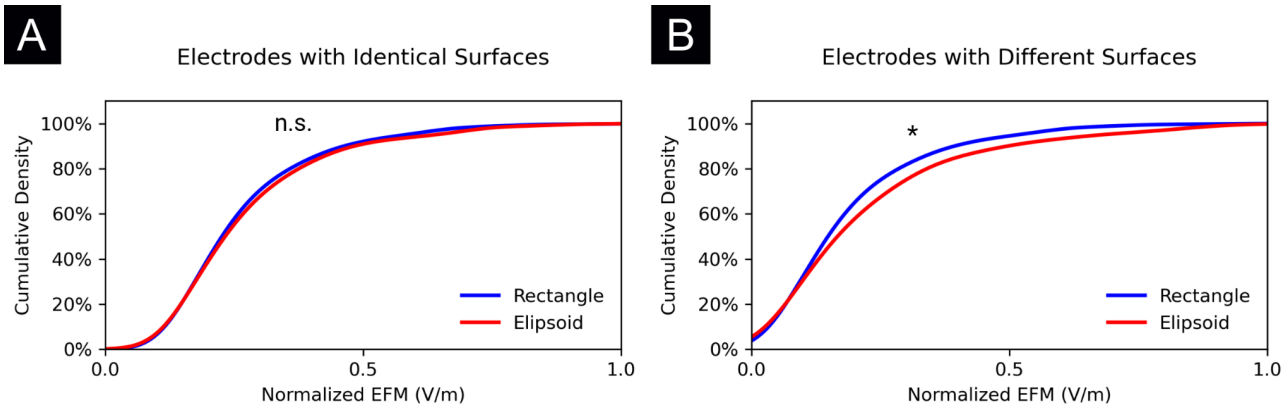


Page 97, line 20, Figure 3-6

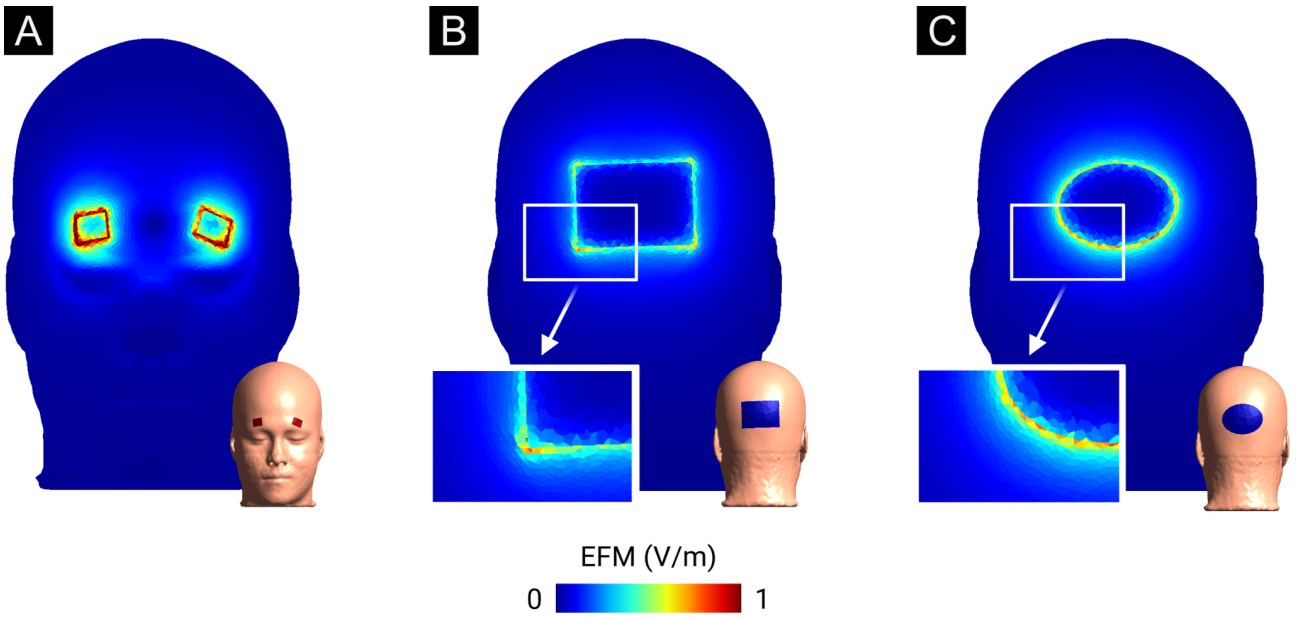
Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits.



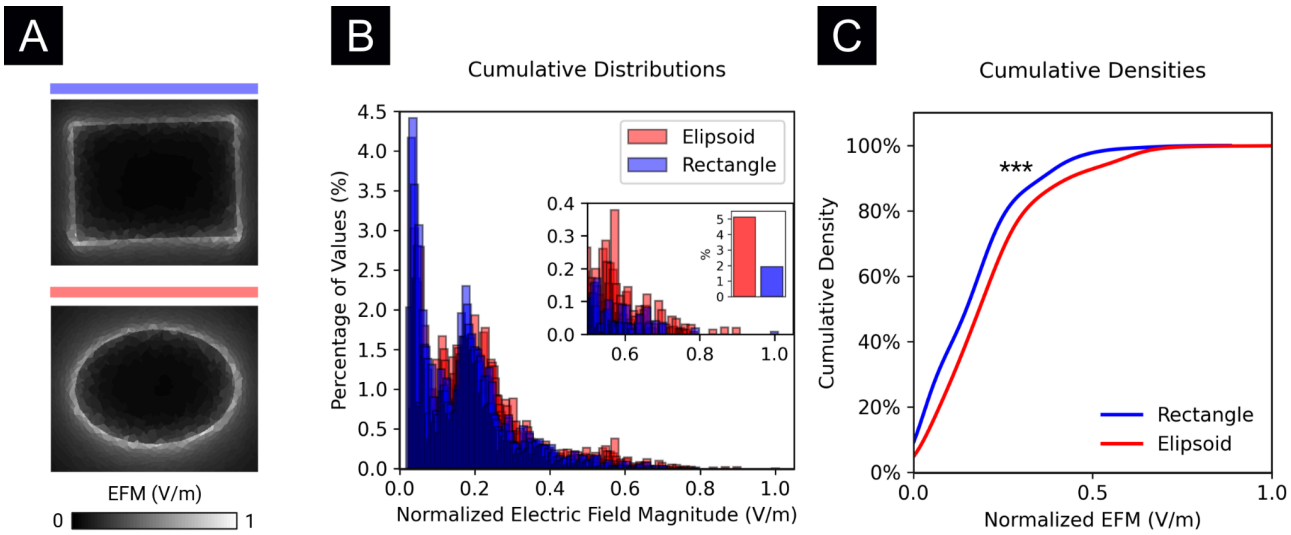
Page 98, line 4, Figure 3-7
Description of changes: Revised figure reflecting the updated eye conductivity.



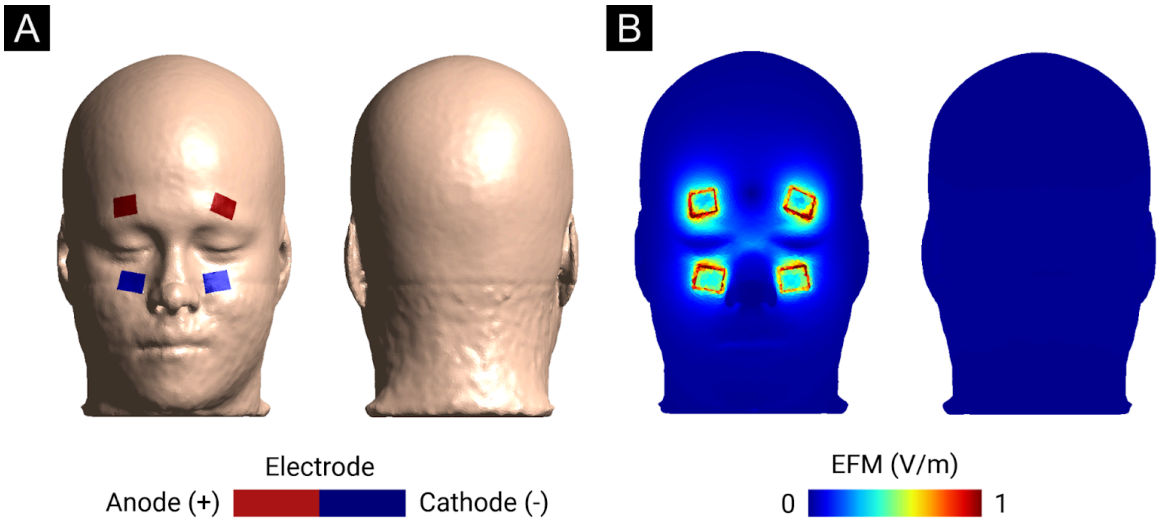
Page 99, line 1, Figure 3-8
Description of changes: Revised figure reflecting the updated eye conductivity.



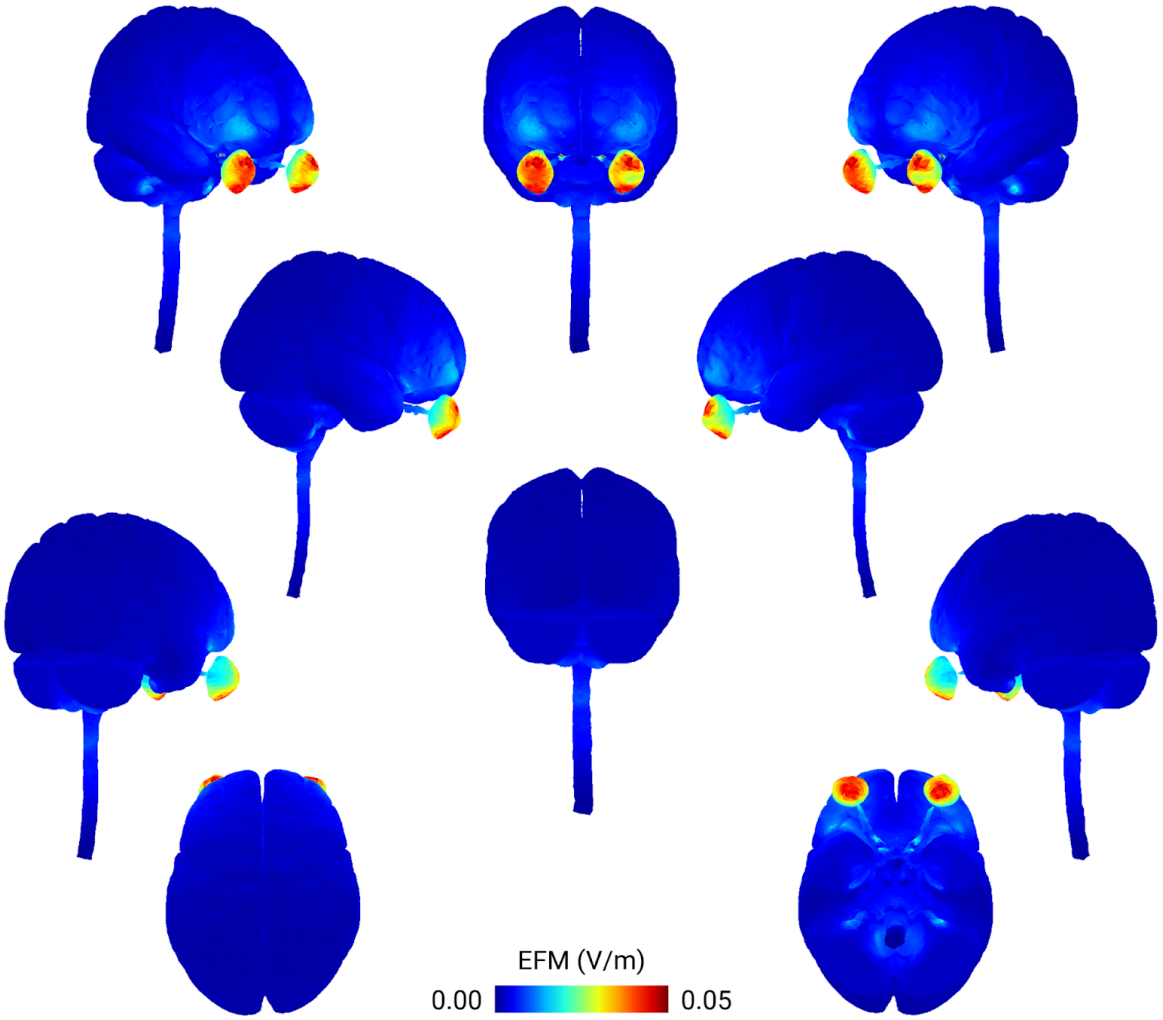
Page 100, line 1, Figure 3-9
Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits.



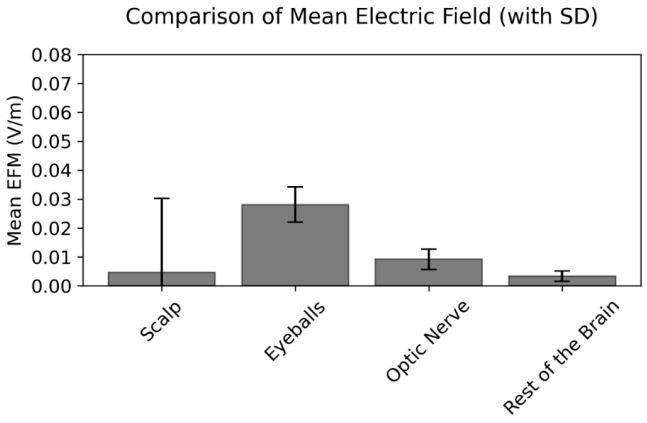
Page 102, line 8, Figure 3-10
Description of changes: Revised figure reflecting the updated eye conductivity.



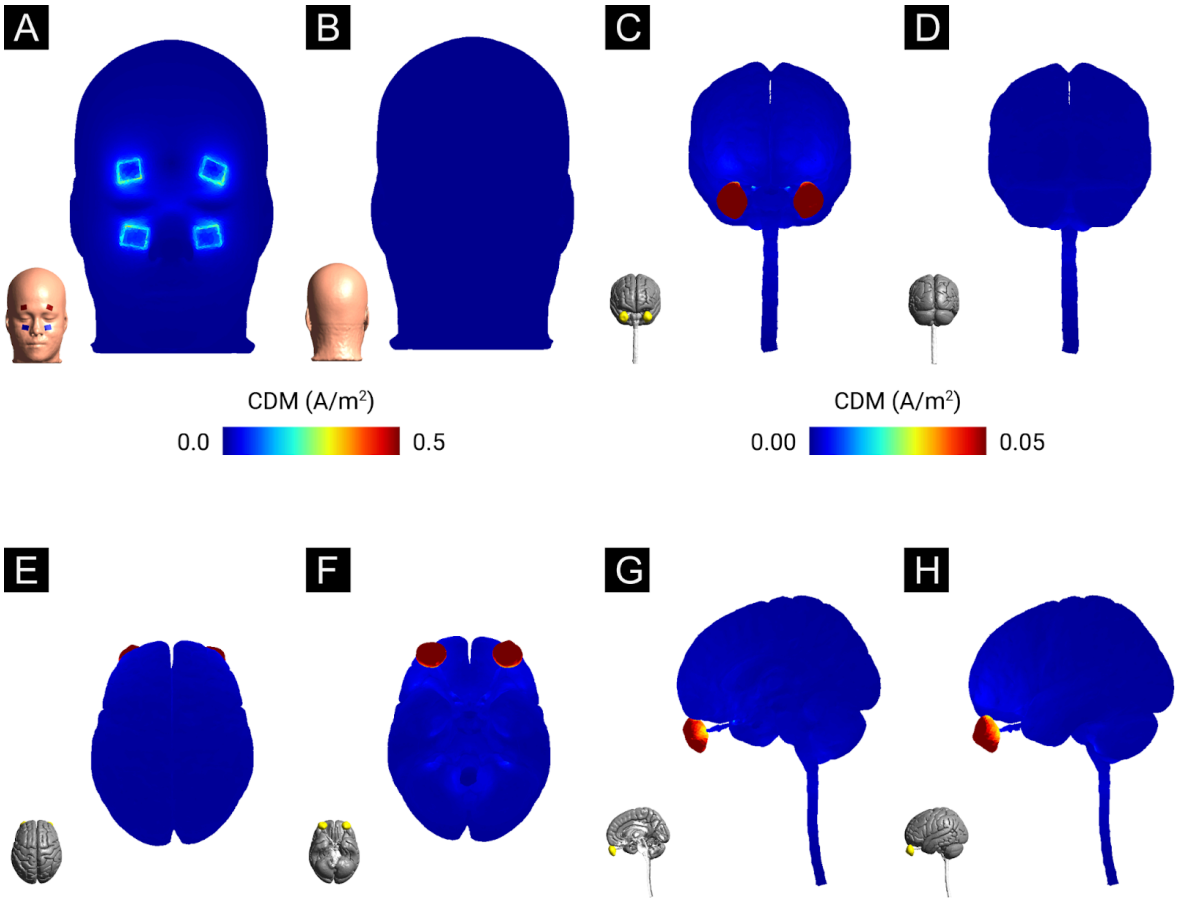
Page 103, line 1, Figure 3-11
Description of changes: Revised figure reflecting the updated eye conductivity.



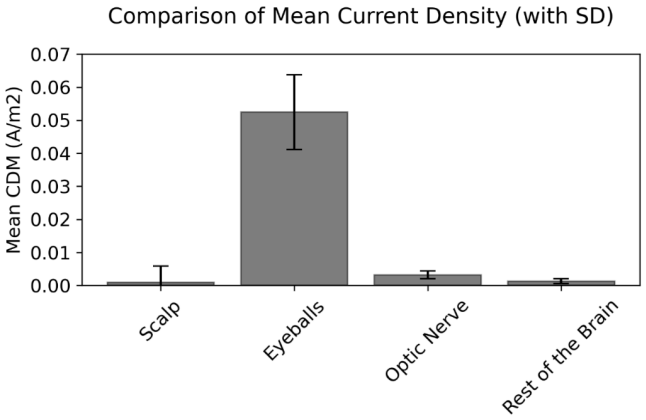
Page 104, line 8, Figure 3-12
Description of changes: Revised figure reflecting the updated eye conductivity and the removal of the "Total Electric Field Across Volumes" panel.



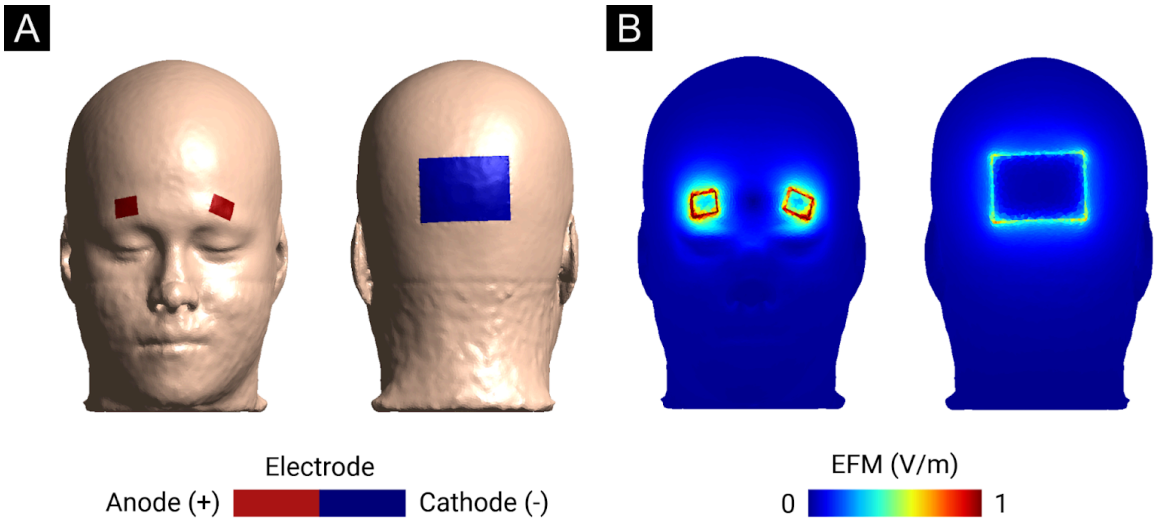
Page 106, line 6, Figure 3-13
Description of changes: Revised figure reflecting the updated eye conductivity.



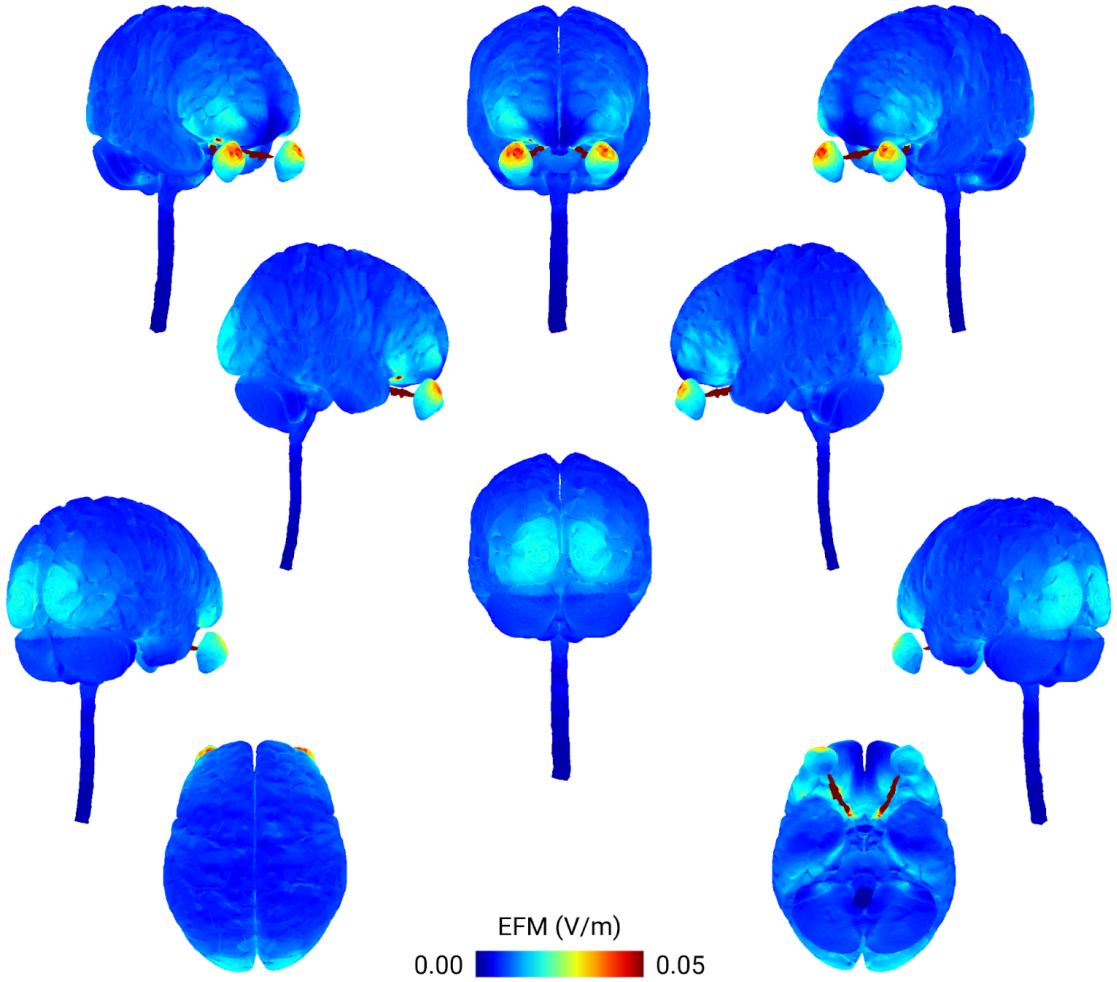
Page 108, line 1, Figure 3-14
Description of changes: Revised figure reflecting the updated eye conductivity and the removal of the "Total Current Across Volumes" panel. Adjusted Y-axis limits.



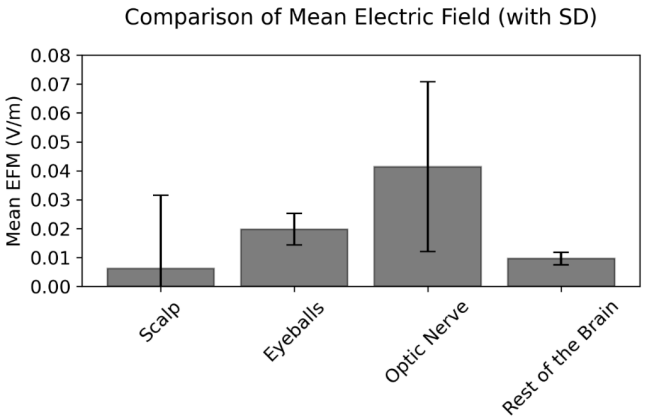
Page 109, line 1, Figure 3-15
Description of changes: Revised figure reflecting the updated eye conductivity.



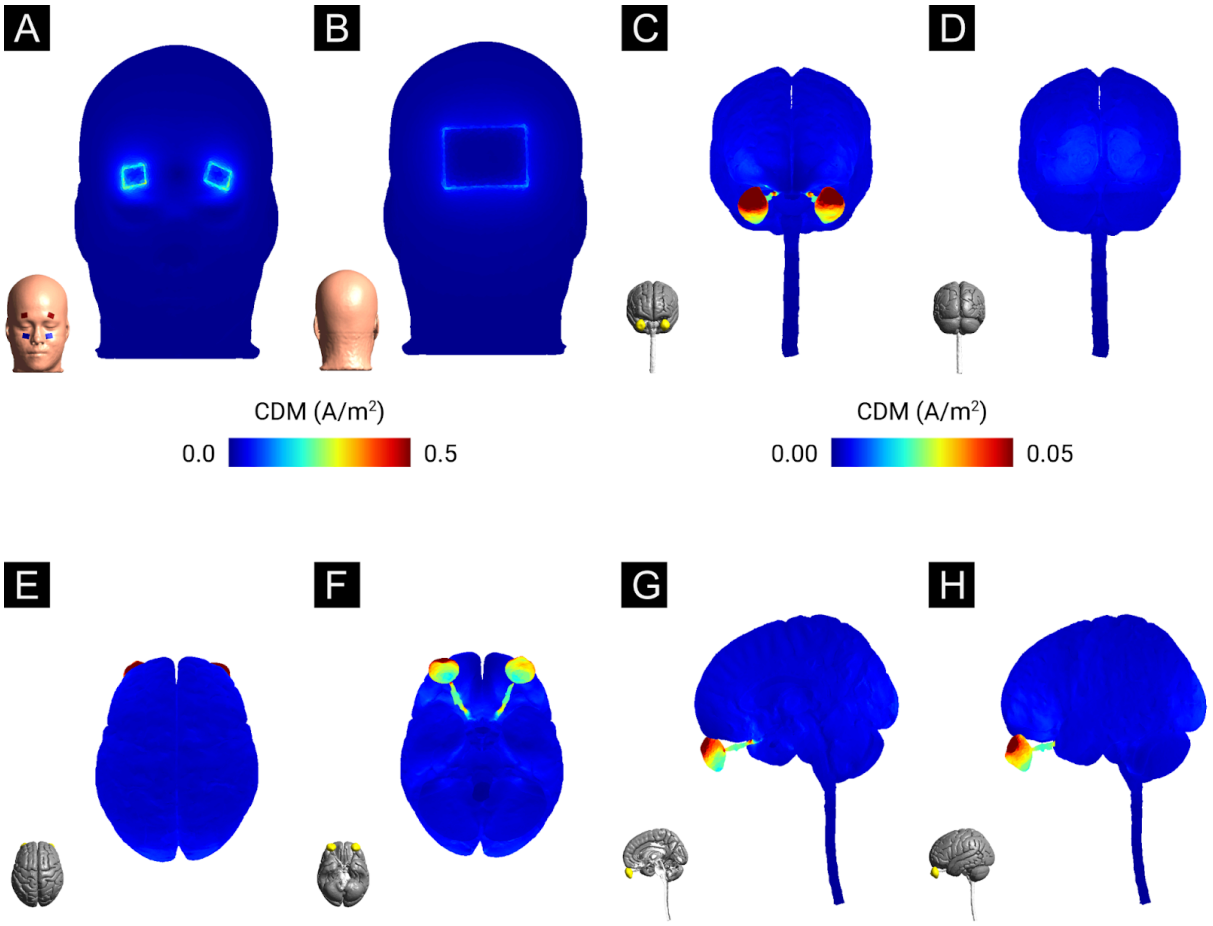
Page 110, line 7, Figure 3-16
Description of changes: Revised figure reflecting the updated eye conductivity.



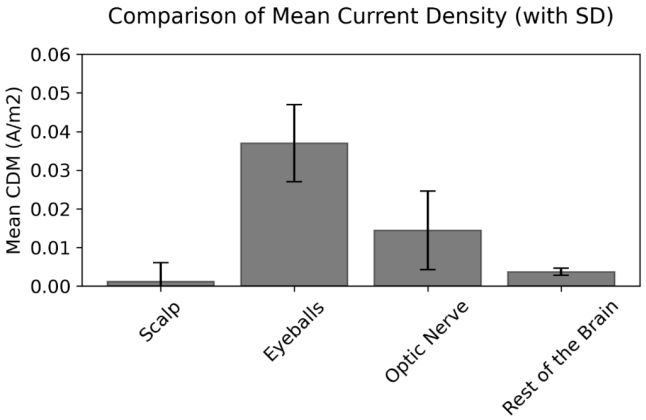
Page 112, line 6, Figure 3-17
Description of changes: Revised figure reflecting the updated eye conductivity and the removal of the "Total Electric Field Across Volumes" panel.



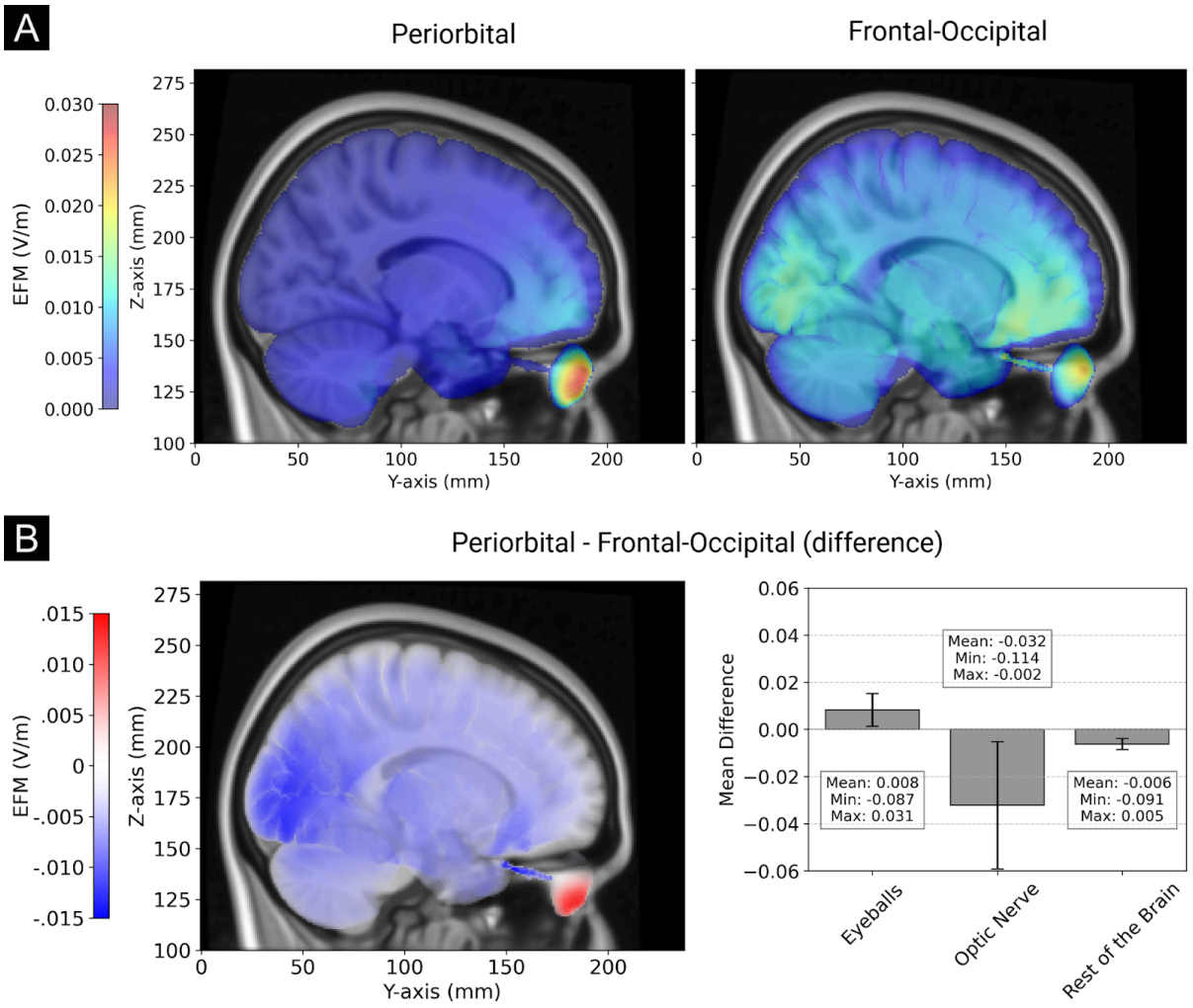
Page 113, line 1, Figure 3-18
Description of changes: Revised figure reflecting the updated eye conductivity.



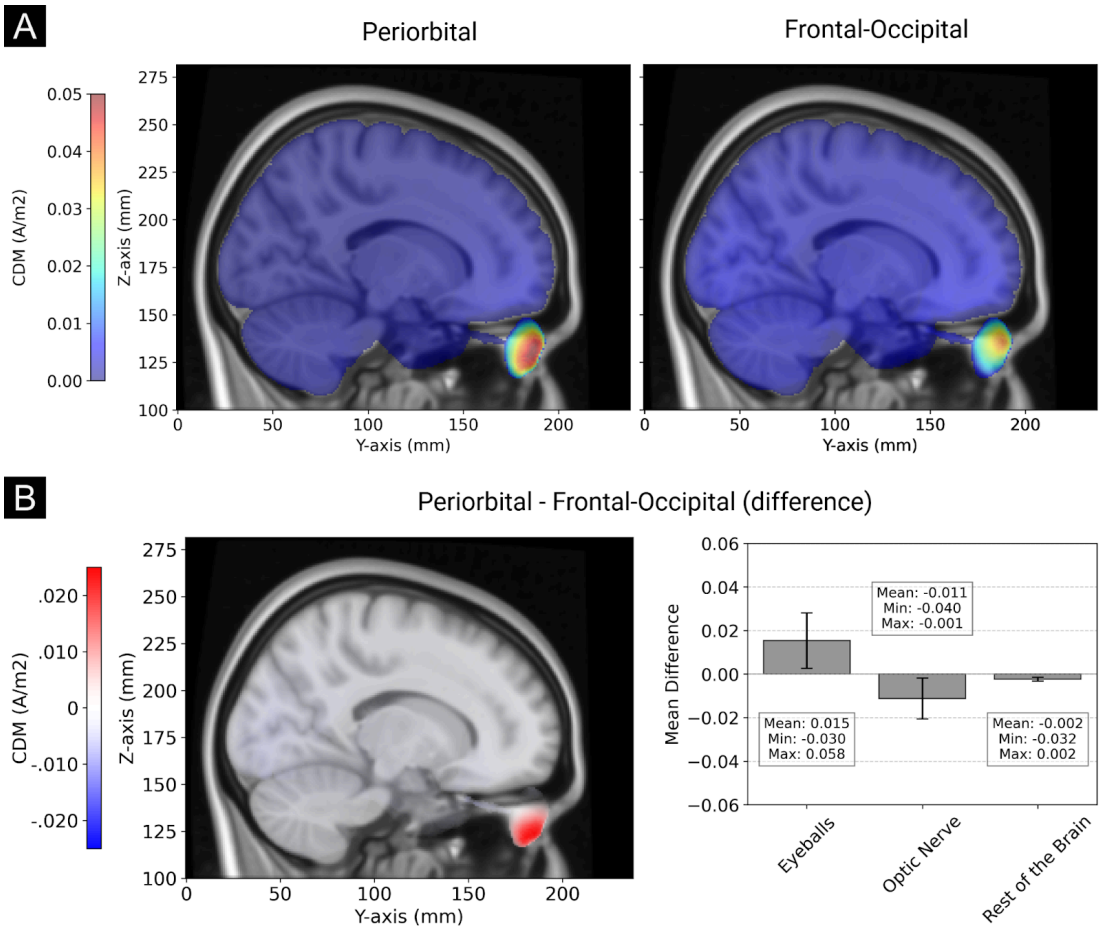
Page 115, line 1, Figure 3-19
Description of changes: Revised figure reflecting the updated eye conductivity and the removal of the "Total Current Across Volumes" panel.



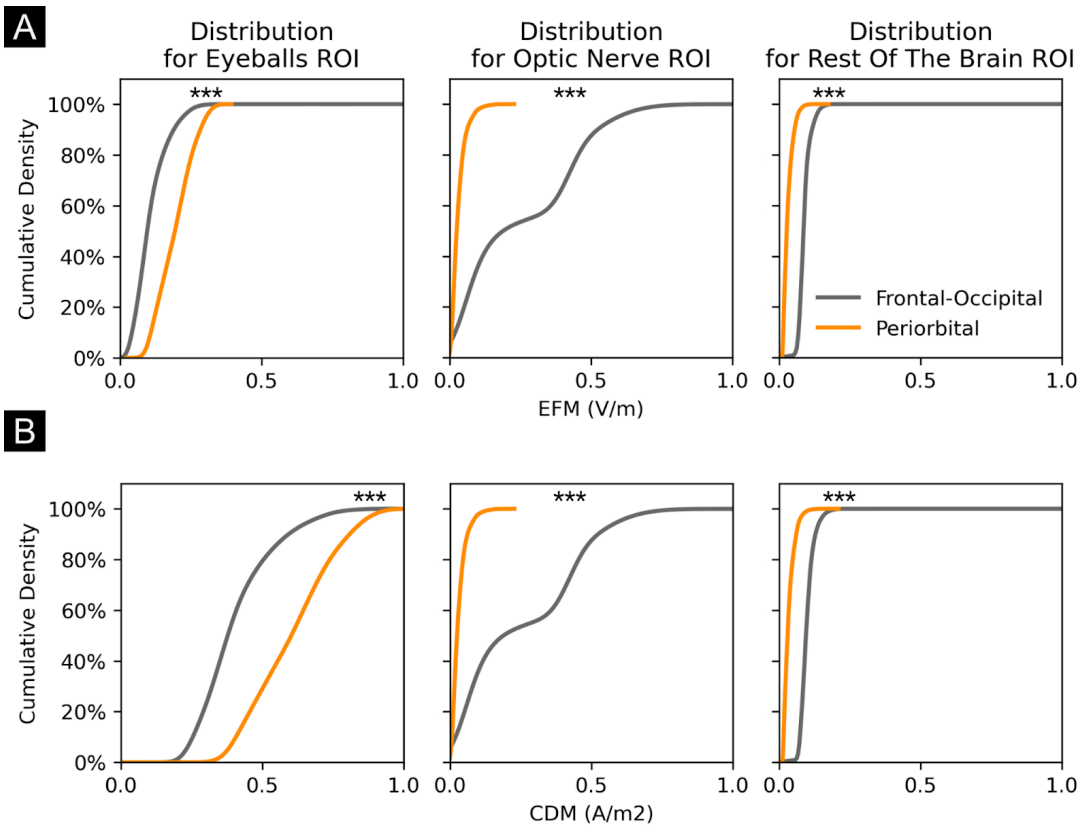
Page 117, line 1, Figure 3-20
Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits. Corrected reference to Figure 3-4A.



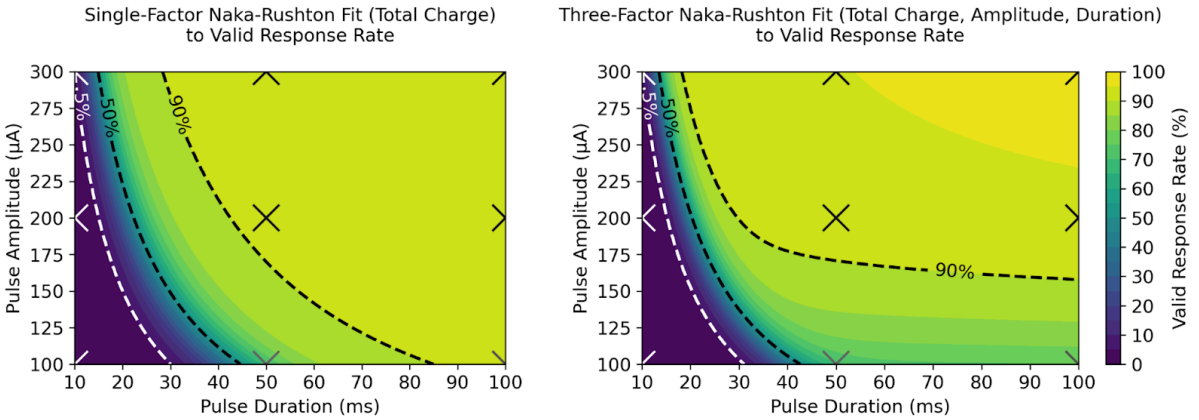
Page 119, line 1, Figure 3-21
Description of changes: Revised figure reflecting the updated eye conductivity. Adjusted Y-axis limits.



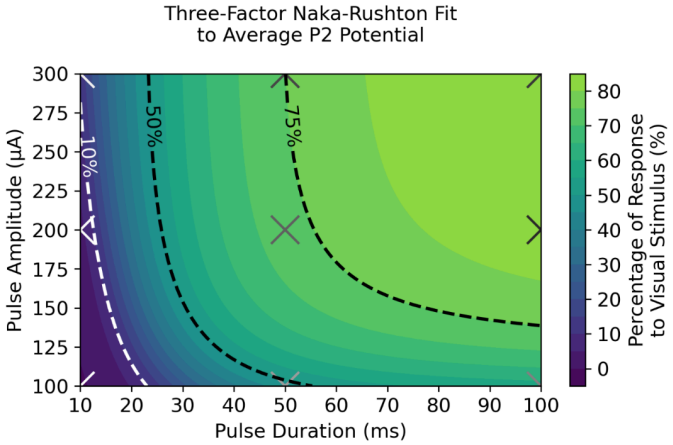
Page 120, line 4, Figure 3-22
Description of changes: Revised figure reflecting the updated eye conductivity.



Page 129, line 1, Figure 3-25
Description of changes: Revised figure reflecting the use of integration-based instead of RMS-based pulse total charge calculations.



Page 144, line 9, Figure 3-31C
Description of changes: Revised figure reflecting the use of integration-based instead of RMS-based pulse total charge calculations.



Revised abbreviations

The missing expansions of the abbreviations are provided below.

ADL	activities of daily living
CNS	central nervous system
CNTF	ciliary nerve trophic factor
DCS	direct current stimulation
FGF	fibroblast growth factor
GS	glutamine synthetase
IGF-1	insulin-like growth factor 1
PG	primary microglia
RNS	random noise stimulation
TNF-α	tumor necrosis factor-α