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Supplementary Online Material

Temporal dynamics of ocular indicators of sleepiness across sleep restriction

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Supplementary Online Figure S1

Supplementary Online Figure S2

Supplementary Online Table S1

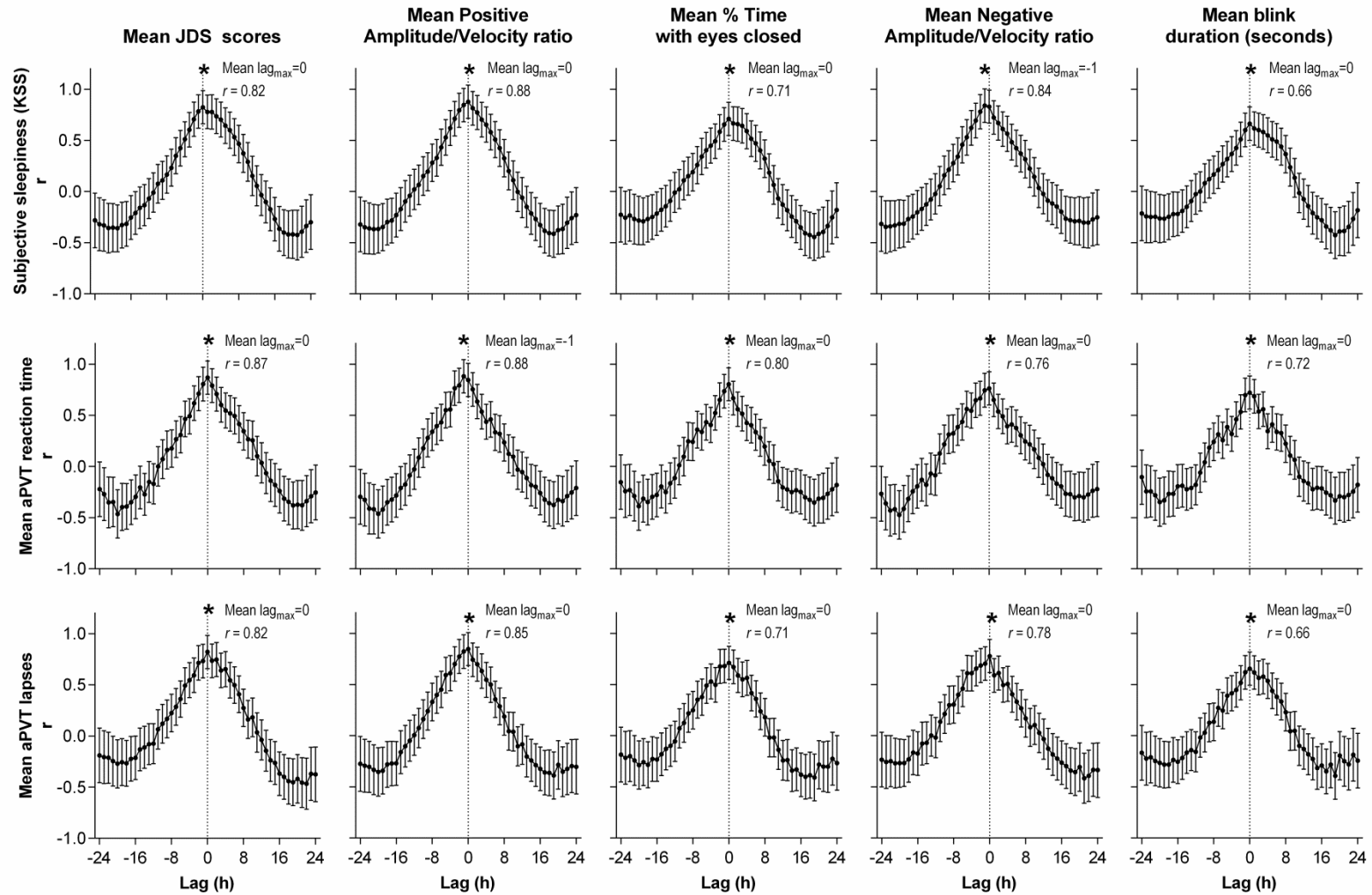


Figure S1. Cross-correlations between subjective sleepiness, mean aPVT reaction time and lapses, and ocular measures. *Mean lag_{max} correlation coefficients significant to $p < 0.05$. aPVT = Auditory Psychomotor Vigilance Task, KSS = Karolinska Sleepiness Scale, JDS = Johns Drowsiness Scale

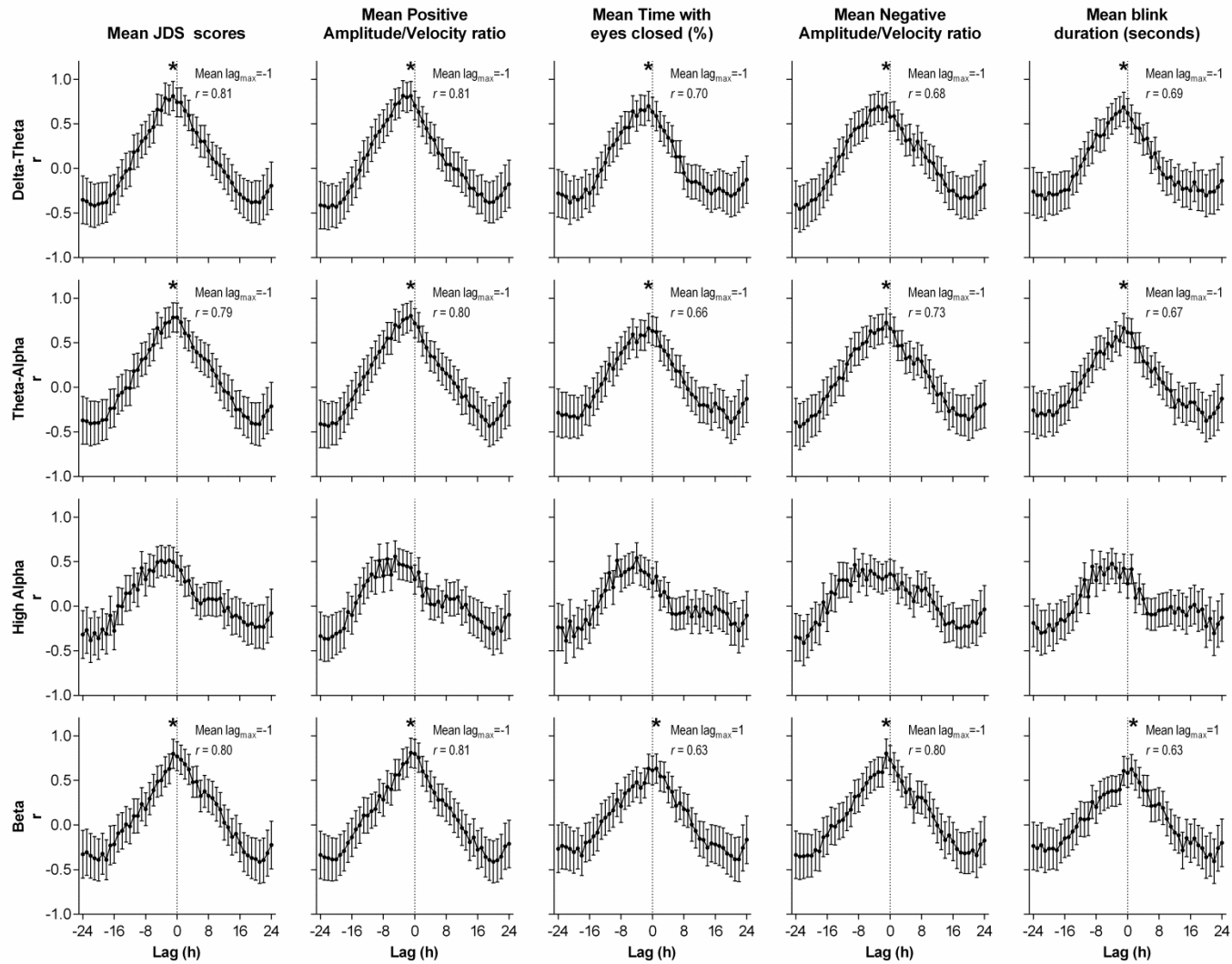


Figure S2. Cross-correlations between EEG power densities and ocular measures. * Mean lag_{max} Correlation coefficients significant to $p < 0.05$. JDS = Johns Drowsiness Scale

Table S1. ROC AUC of ocular measures and subjective sleepiness predicting performance lapses.

Measure	AUC \pm SE	Cut off	Sensitivity (95% CI)	Specificity (95% CI)	χ^2	<i>p</i>
<i>25% threshold</i>						
KSS	0.74 \pm 0.03	6.50	80.9 (73.1 - 87.7)	63.7 (57.6 - 69.5)	-	-
Mean JDS	0.74 \pm 0.03	4.20	70.4 (58.4 - 80.7)	65.7 (59.4 - 71.7)	0.01	0.91
Mean PosAVR	0.80 \pm 0.03	1.70	80.0 (68.7 - 88.6)	76.5 (70.6 - 81.7)	2.04	0.15
Mean %TEC	0.68 \pm 0.04	4.49	65.7 (53.4 - 76.7)	61.0 (54.5 - 67.2)	2.41	0.12
Mean NegAVR	0.67 \pm 0.03	2.16	67.6 (55.5 - 78.2)	63.2 (56.8 - 69.3)	3.04	0.08
Mean BD	0.75 \pm 0.04	620	70.0 (57.9 - 80.4)	68.5 (62.2 - 74.3)	0.08	0.78
<i>50% threshold</i>						
KSS	0.72 \pm 0.03	6.50	80.3 (70.3 - 86.8)	62.2 (56.2 - 67.9)	-	-
Mean JDS	0.76 \pm 0.03	4.20	71.4 (58.7 - 82.1)	64.8 (58.5 - 70.7)	0.73	0.39
Mean PosAVR	0.82 \pm 0.03	1.71	80.7 (68.6 - 89.6)	76.0 (70.2 - 81.2)	5.83	0.02
Mean %TEC	0.69 \pm 0.04	4.45	67.7 (54.7 - 79.1)	60.2 (53.9 - 66.4)	0.69	0.40
Mean NegAVR	0.70 \pm 0.03	2.16	69.8 (57.0 - 80.8)	62.8 (56.5 - 68.8)	0.42	0.52
Mean BD	0.77 \pm 0.04	657.7	71.0 (58.1 - 81.8)	70.7 (64.6 - 76.3)	1.13	0.29
<i>75% threshold</i>						
KSS	0.71 \pm 0.03	6.5	79.0 (70.0 - 86.1)	61.1 (55.1 - 66.8)	-	-
Mean JDS	0.74 \pm 0.03	4.29	67.8 (54.4 - 73.4)	66.5 (60.4 - 72.3)	0.58	0.45
Mean PosAVR	0.81 \pm 0.03	1.70	81.0 (68.6 - 90.1)	74.0 (68.2 - 79.3)	5.65	0.02
Mean %TEC	0.67 \pm 0.04	4.65	63.8 (50.1 - 76.0)	60.1 (53.8 - 66.2)	0.50	0.48
Mean NegAVR	0.69 \pm 0.03	2.16	69.5 (56.1 - 80.8)	62.2 (55.9 - 68.2)	0.09	0.77
Mean BD	0.75 \pm 0.04	615	70.7 (57.3 - 81.9)	66.0 (59.8 - 71.8)	1.01	0.31

AUC, Area Under the Curve; JDS, Johns Drowsiness Scale; PosAVR, Positive Amplitude/Velocity Ratio; NegAVR, Negative Amplitude/Velocity Ratio; %TEC, percentage of time spent with eyes closed; BD, Blink duration; CI, Confidence Intervals. For each pairwise comparison, the χ^2 statistic is shown, bolded values indicate significant difference compared to KSS.