Autocorrelation of EEG data (volunteer 1)

Arthur Valencio

26/7/2021

Contents

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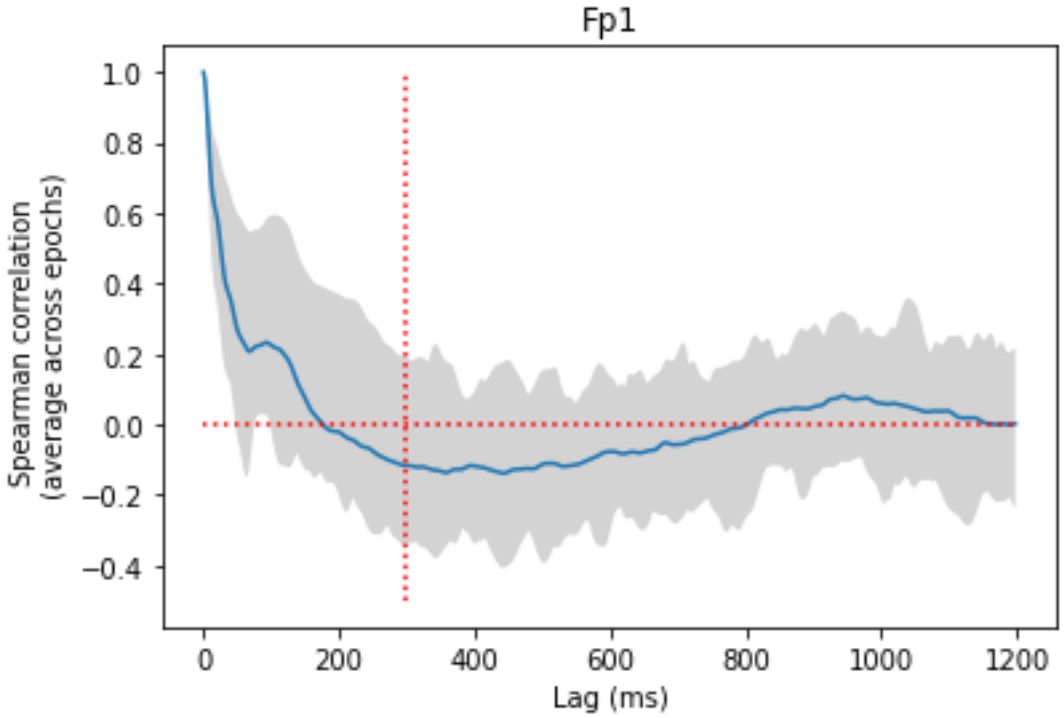
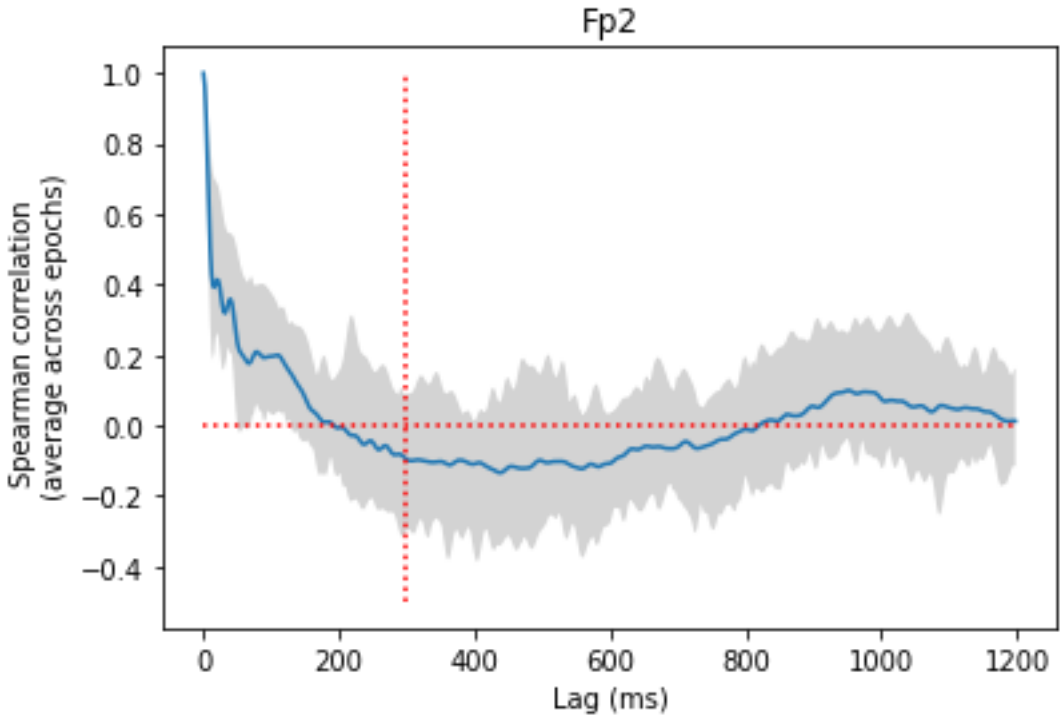
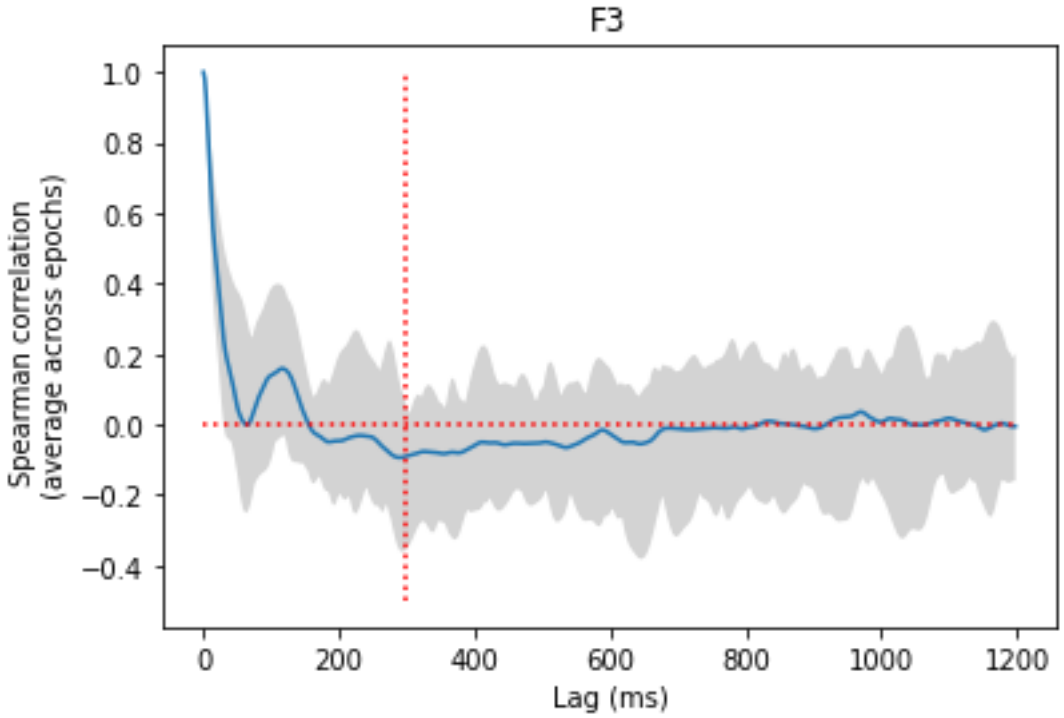
Reference for the plot lines:

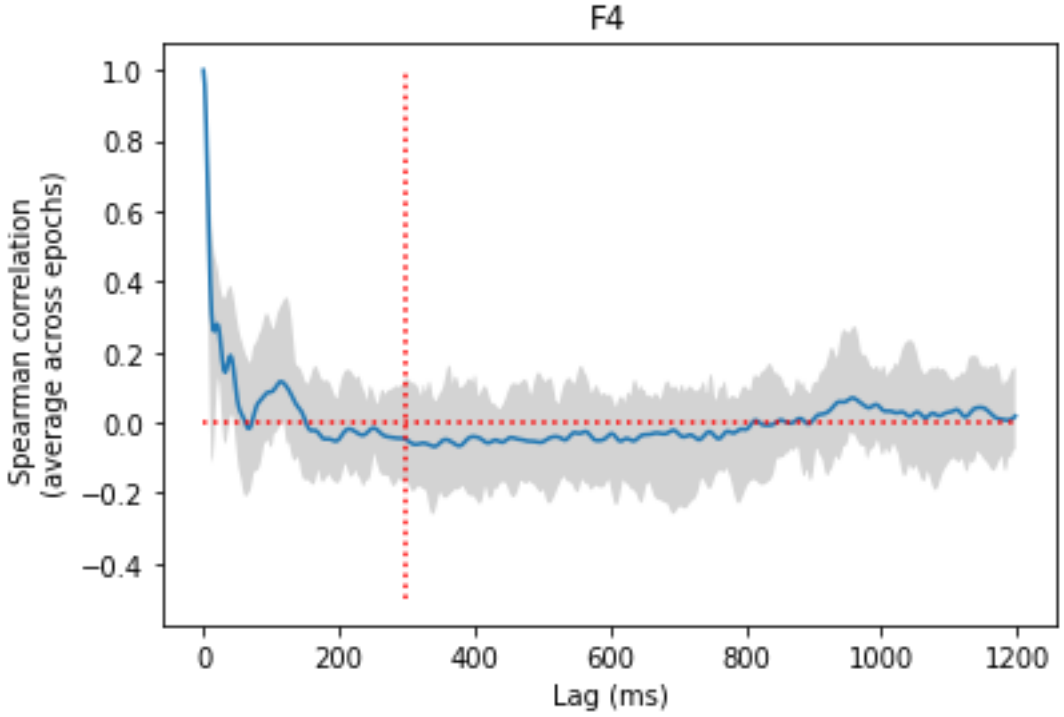
- **Blue line**: average spearman autocorrelation across all epochs
- **Grey area**: interval of maximum and minimum calculated spearman autocorrelation across epochs
- **Red horizontal line**: zero correlation reference
- **Red vertical line**: reference line at lag=300ms, previously selected as the value of parameter τ of symbolic encoding in transfer entropy computation.

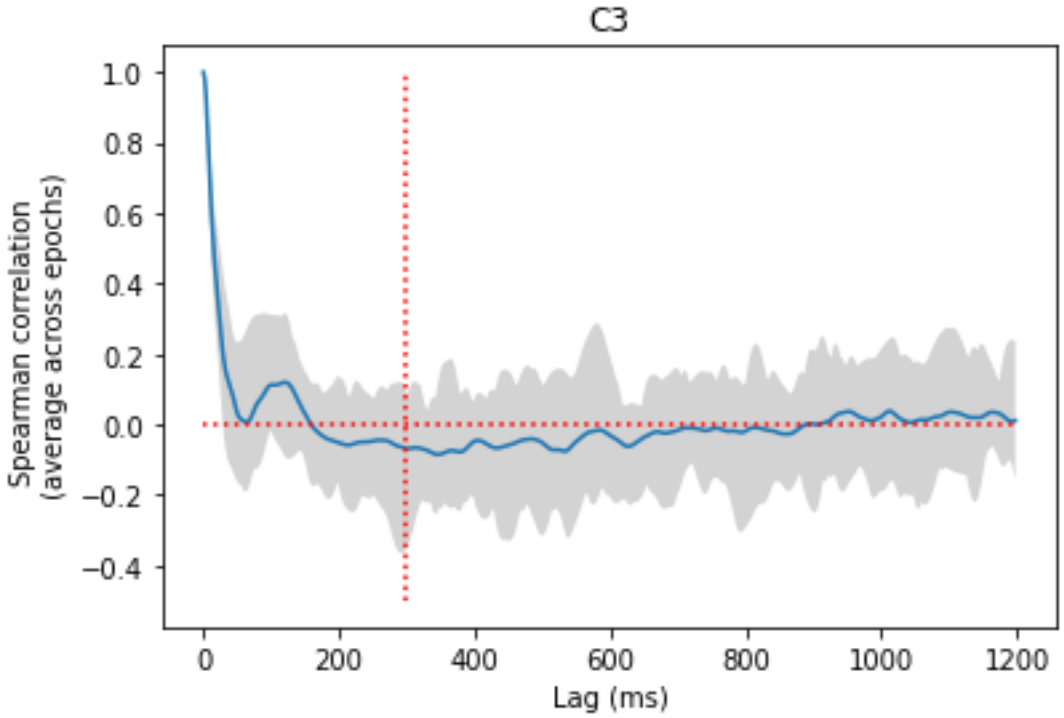
DBS OFF: Quiet

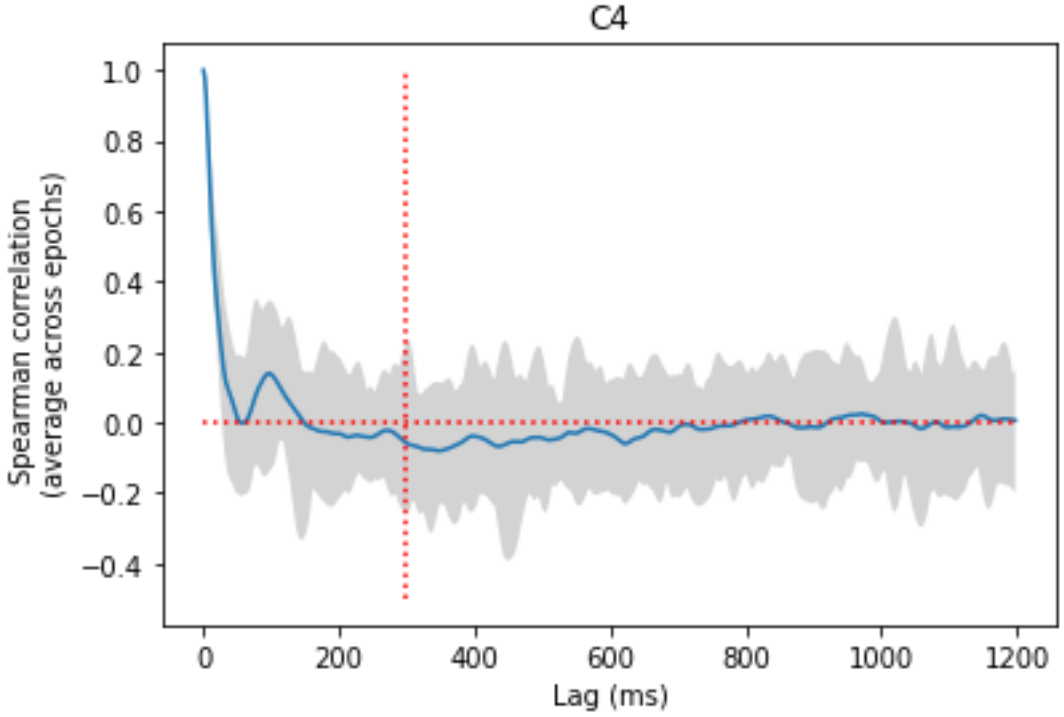


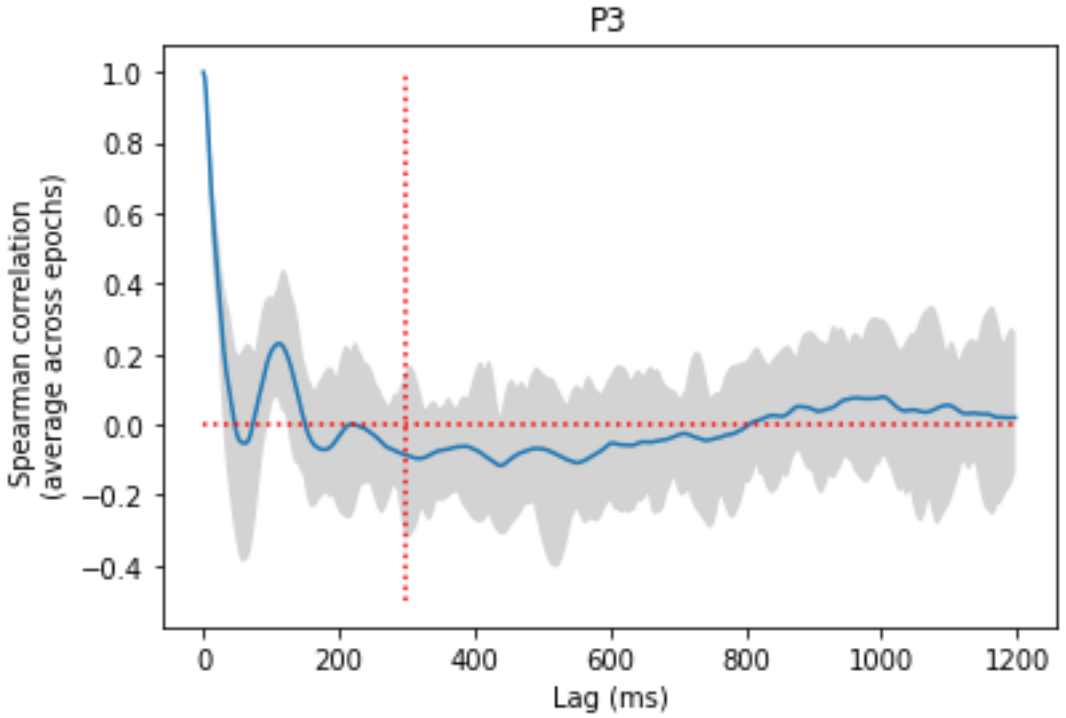


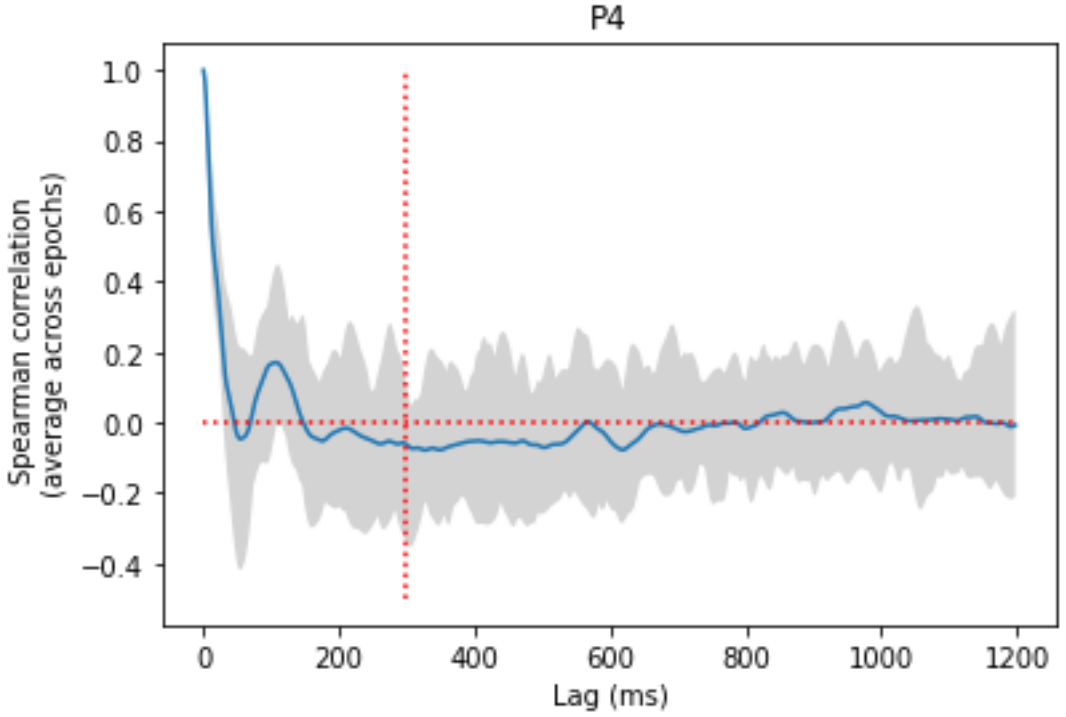

F3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

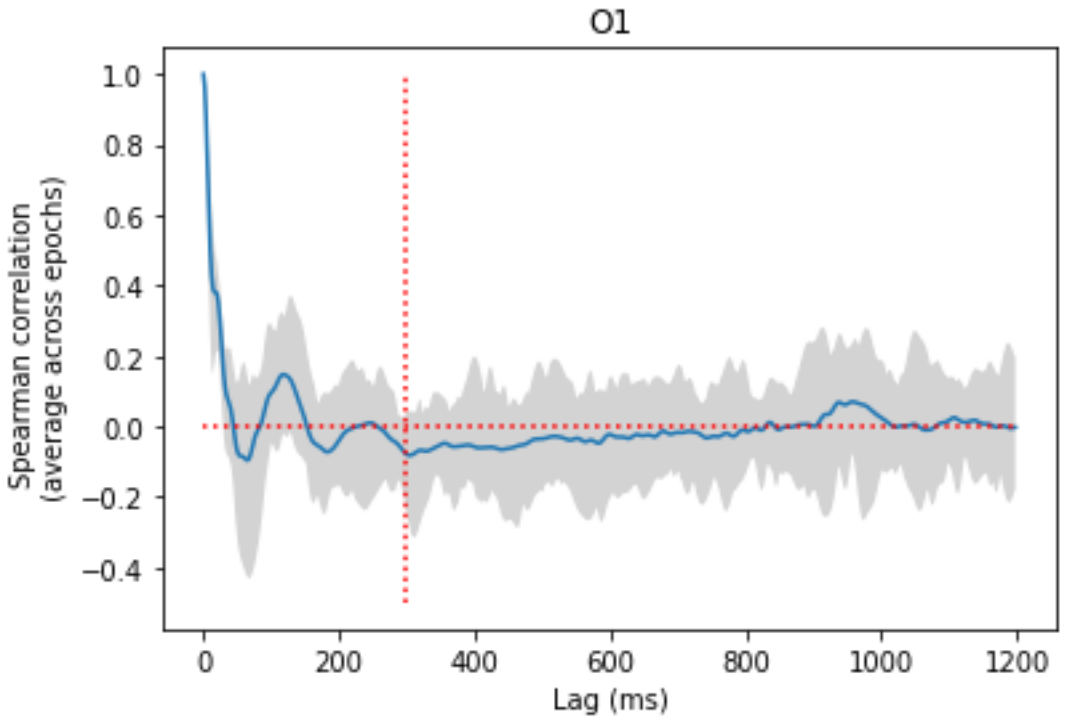

F4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

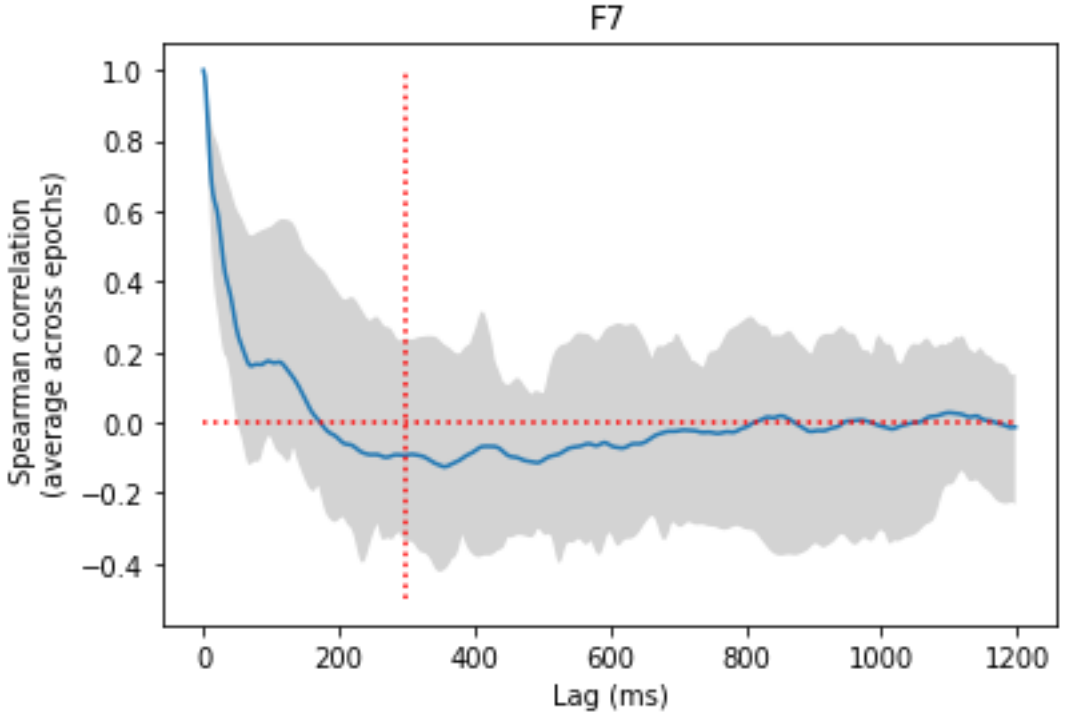

C3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

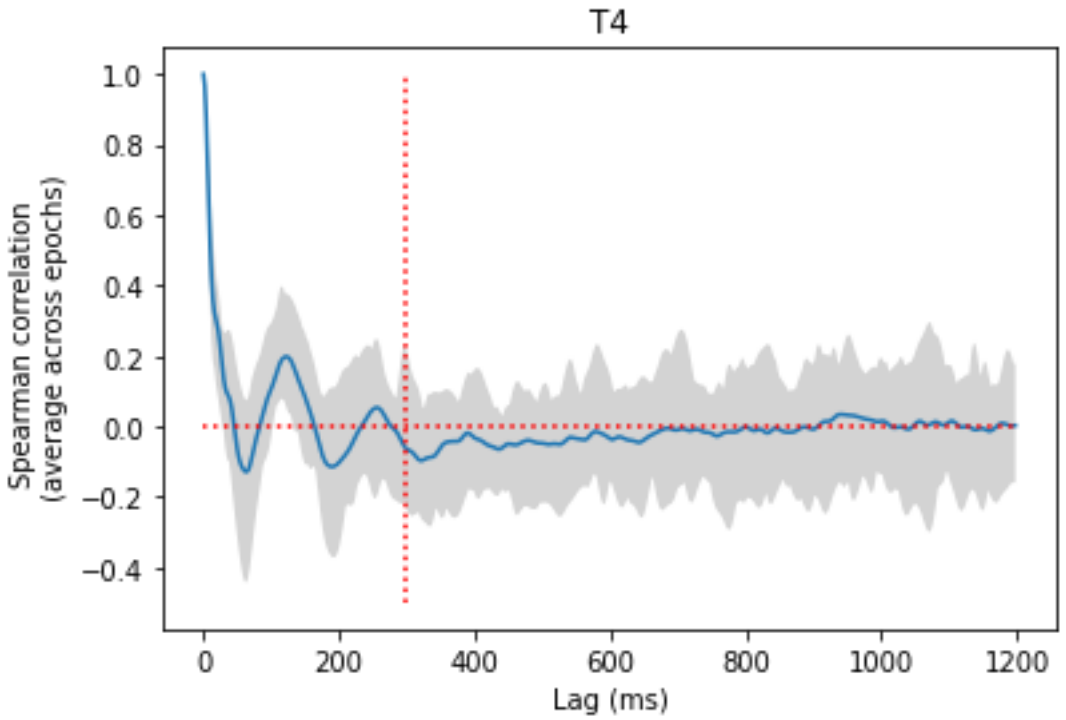

C4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

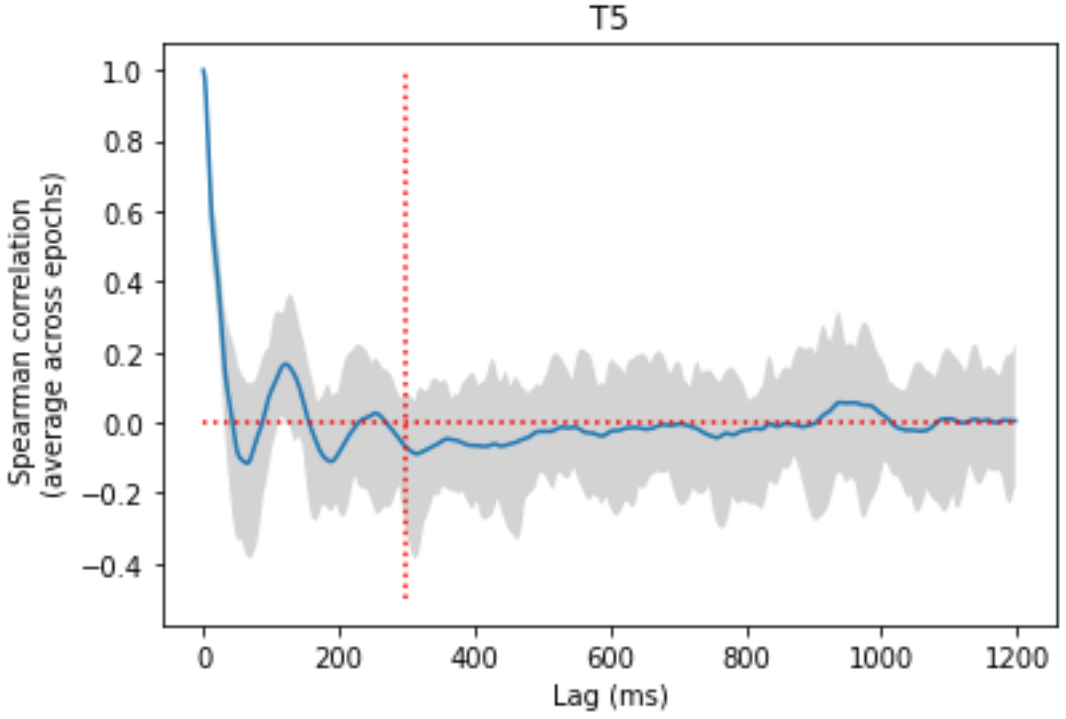

P3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

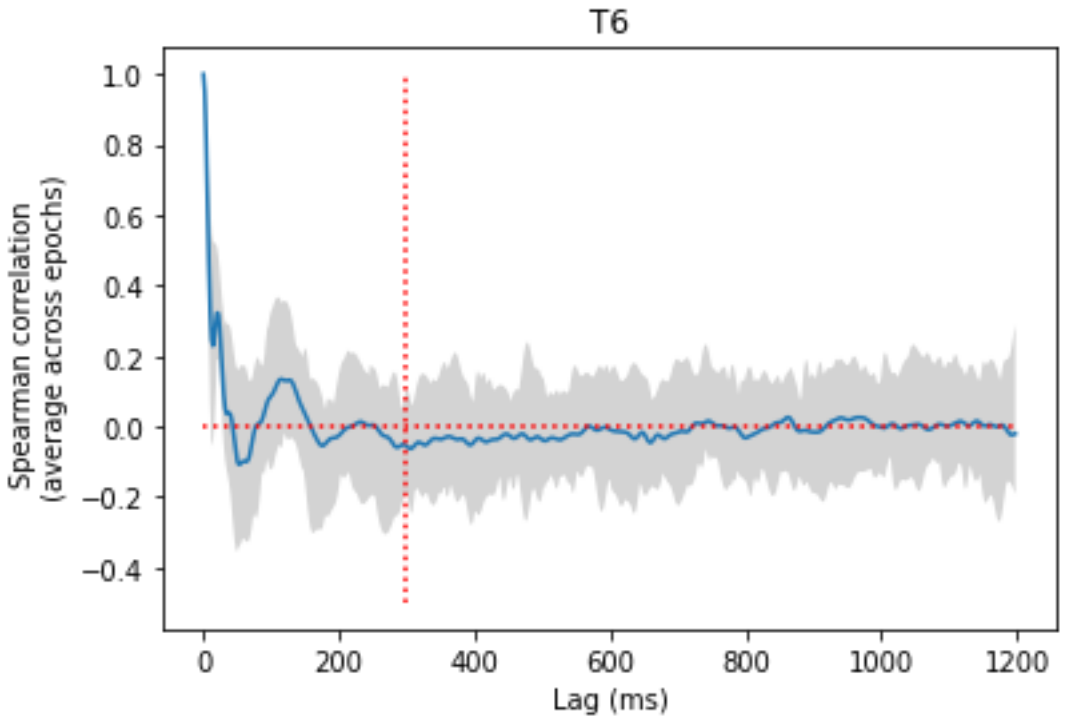

P4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

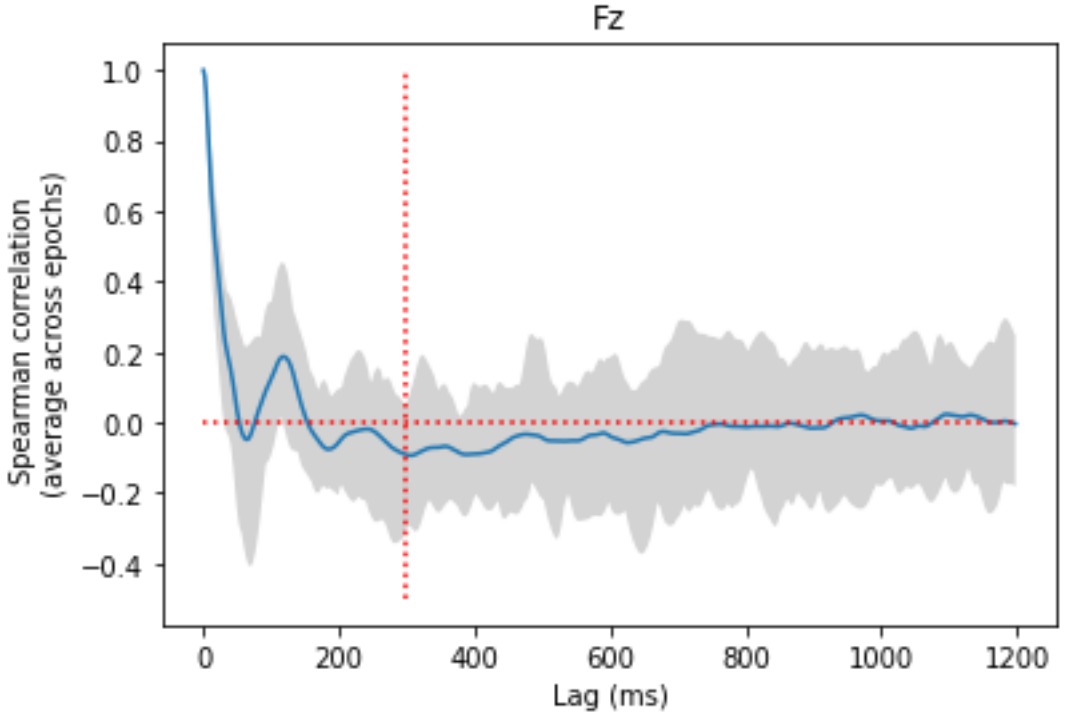

O1
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

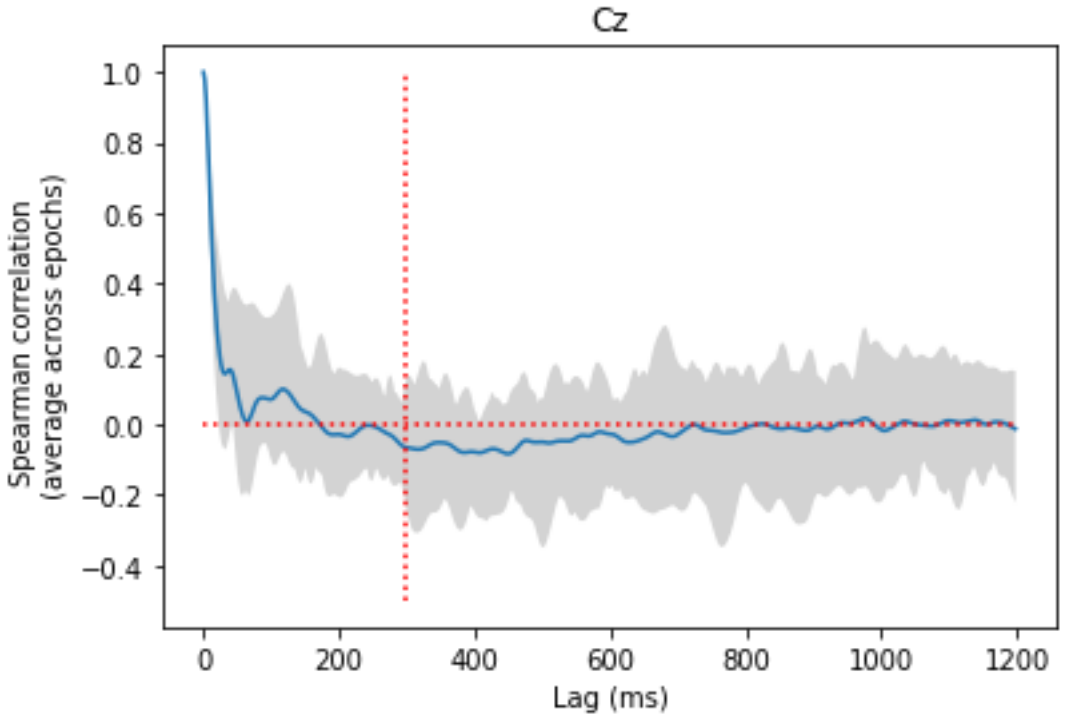

F7
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

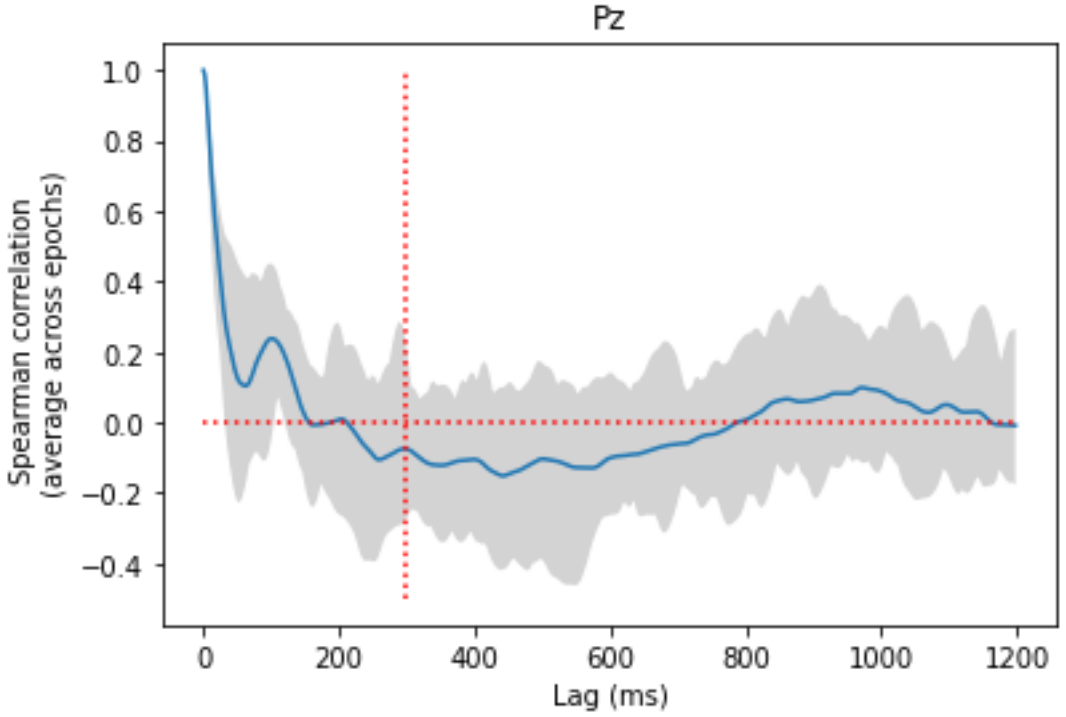

T4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


T5
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

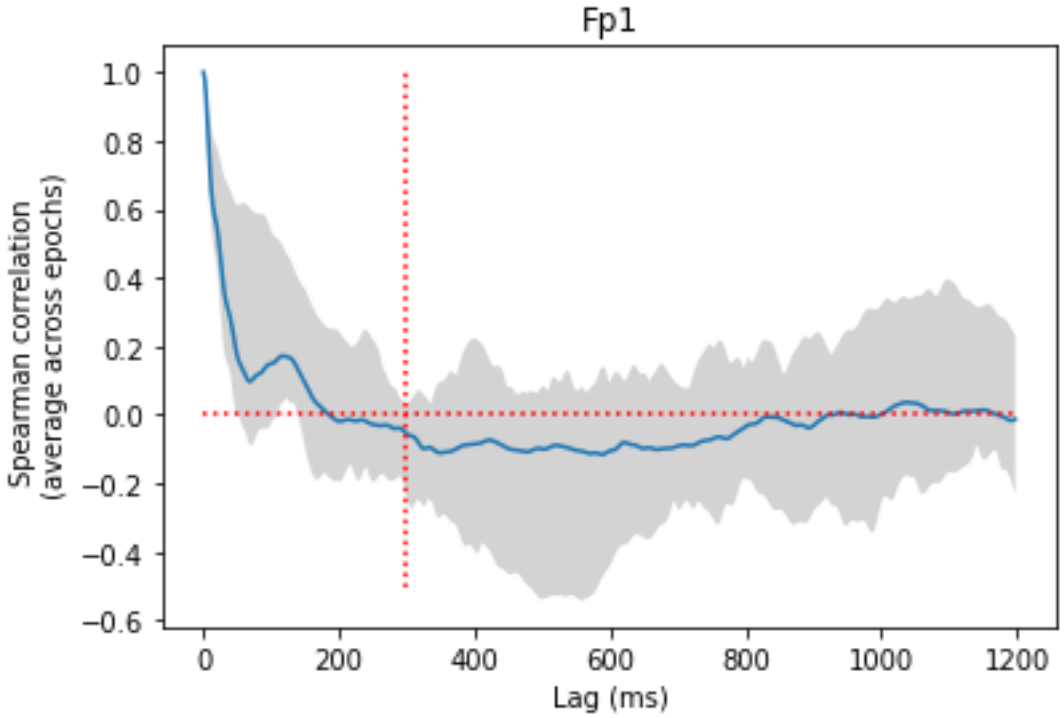

T6
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

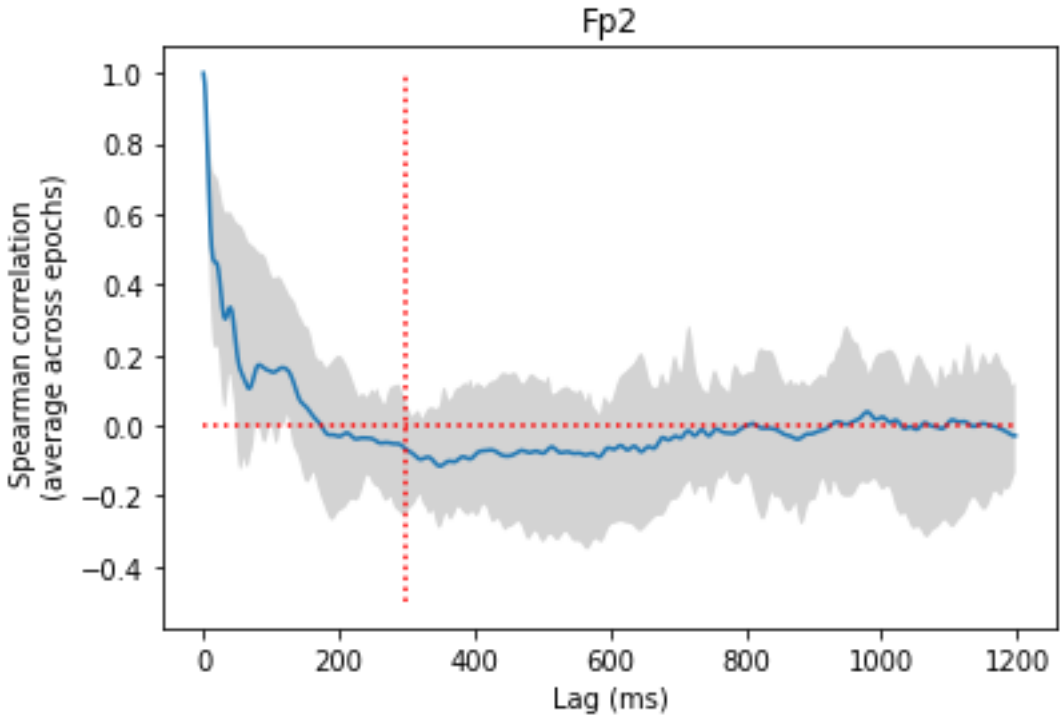

Fz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

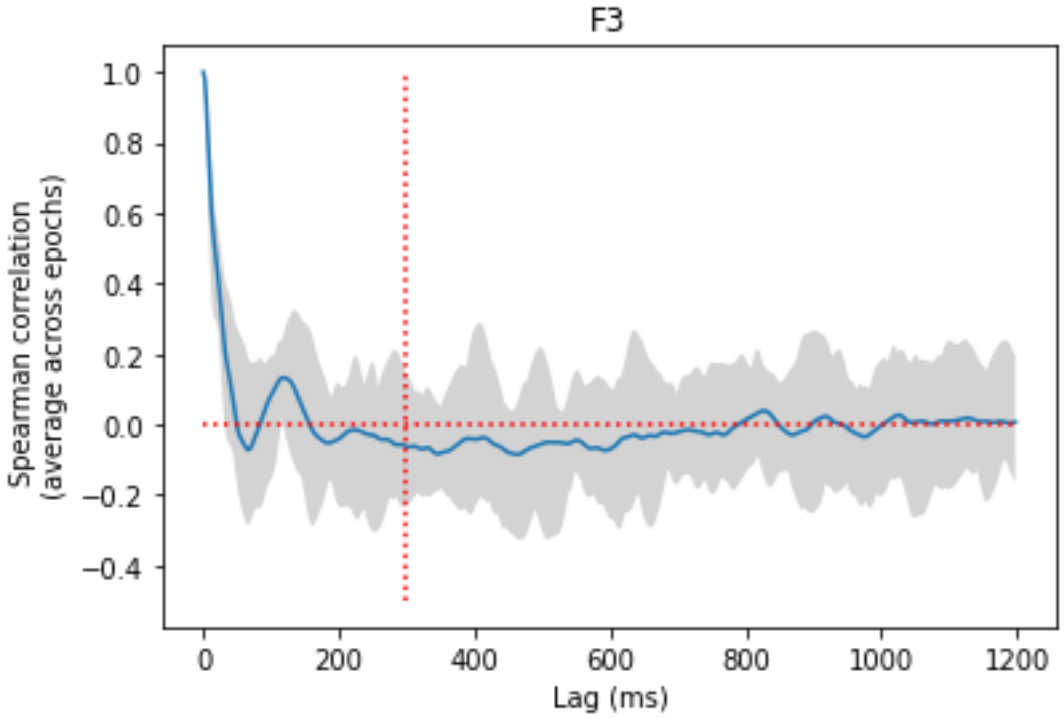

Cz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

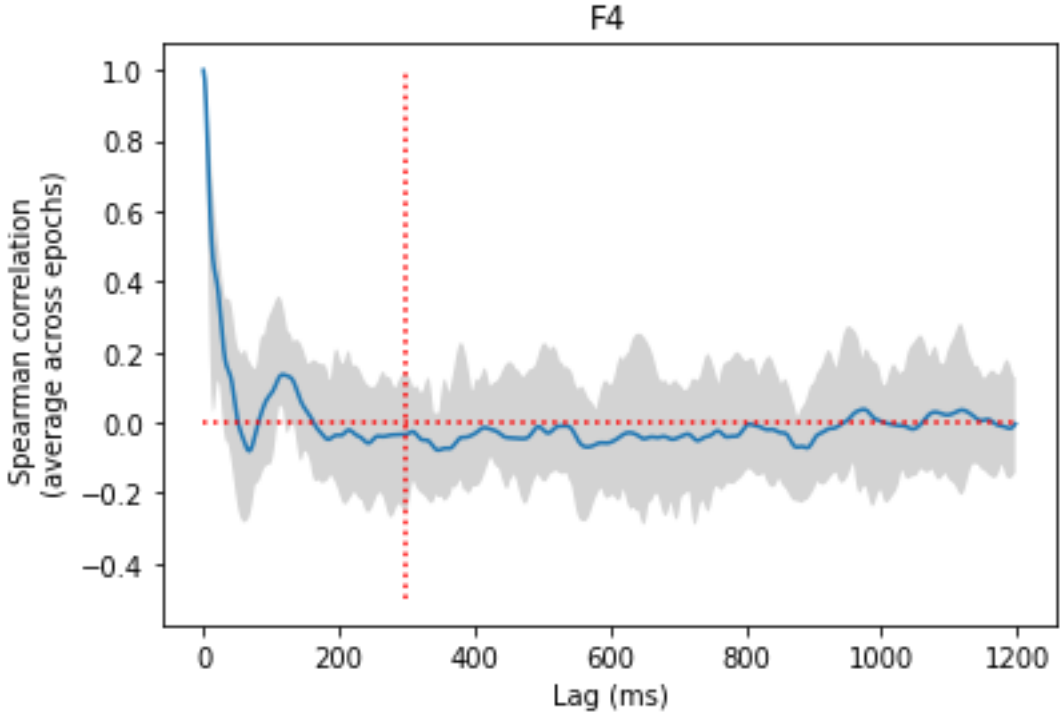

Pz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

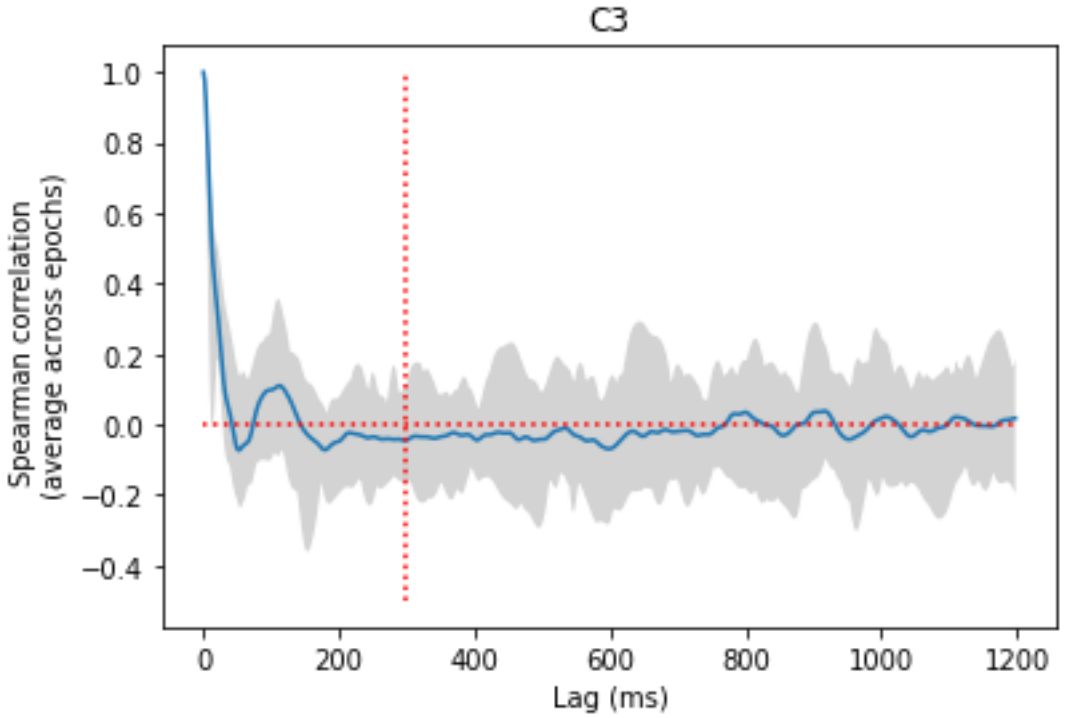
DBS ON: quiet

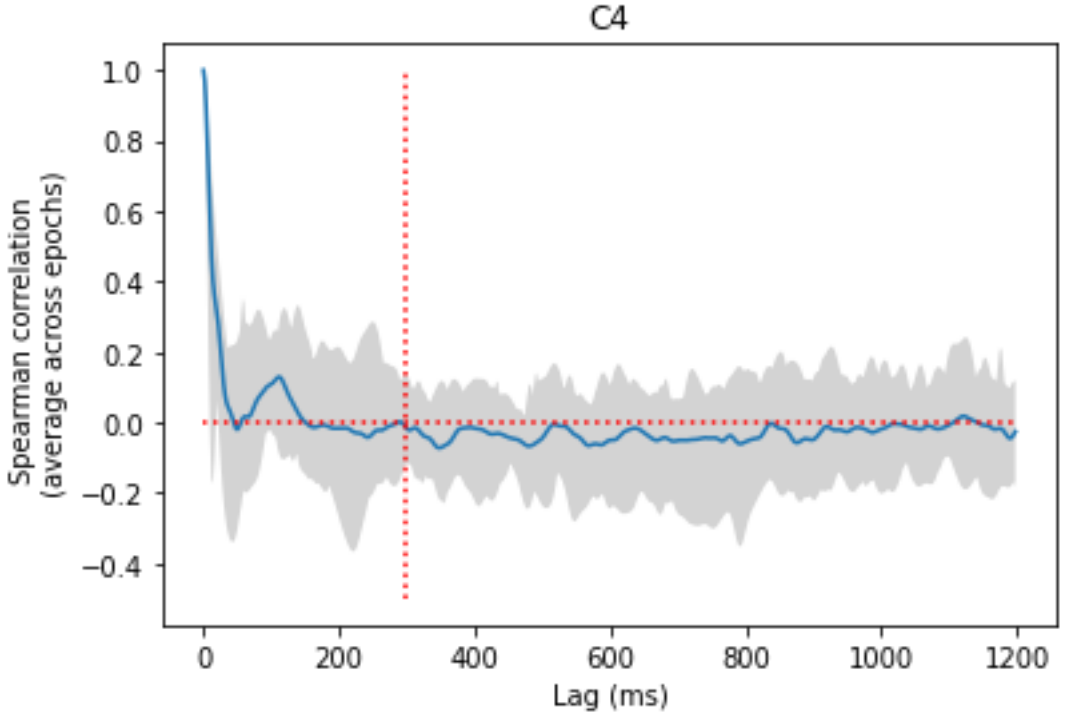

Fp1
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800
1000
1200
Lag (ms)

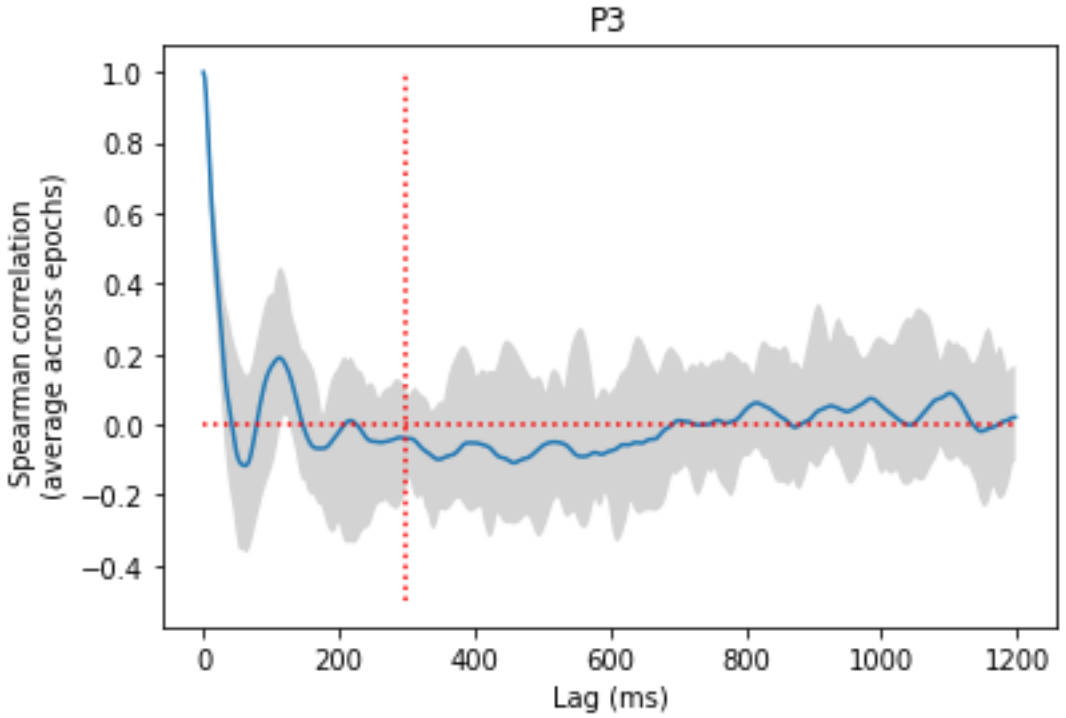

Fp2
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

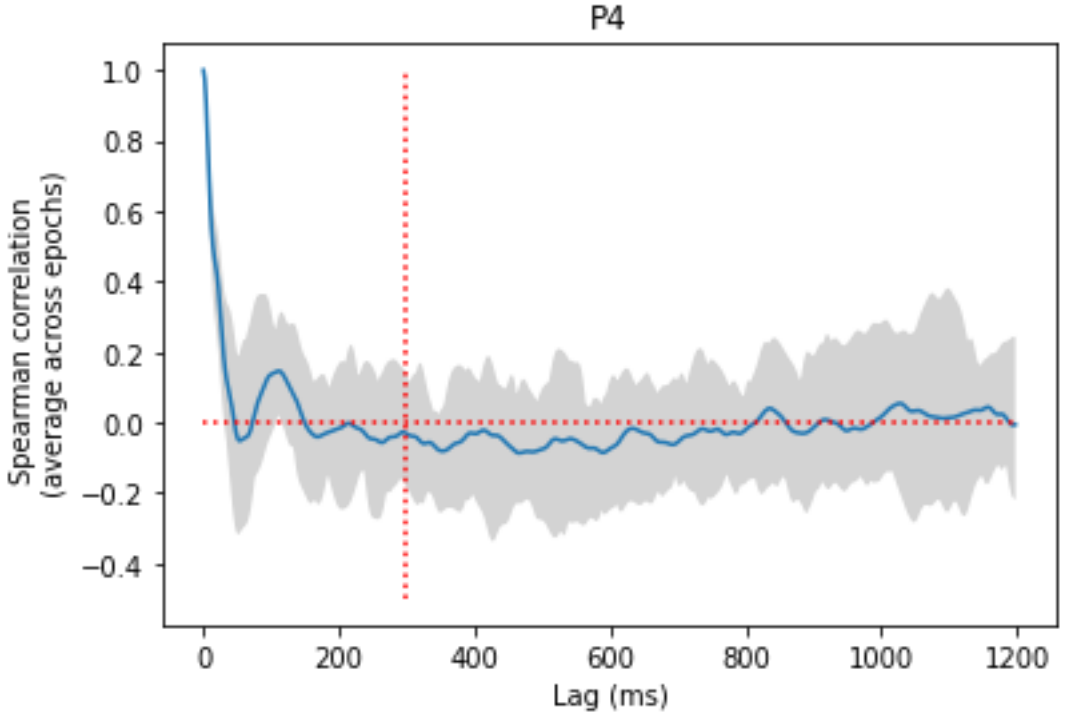

F3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


F4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


C3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


C4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


P3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


P4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
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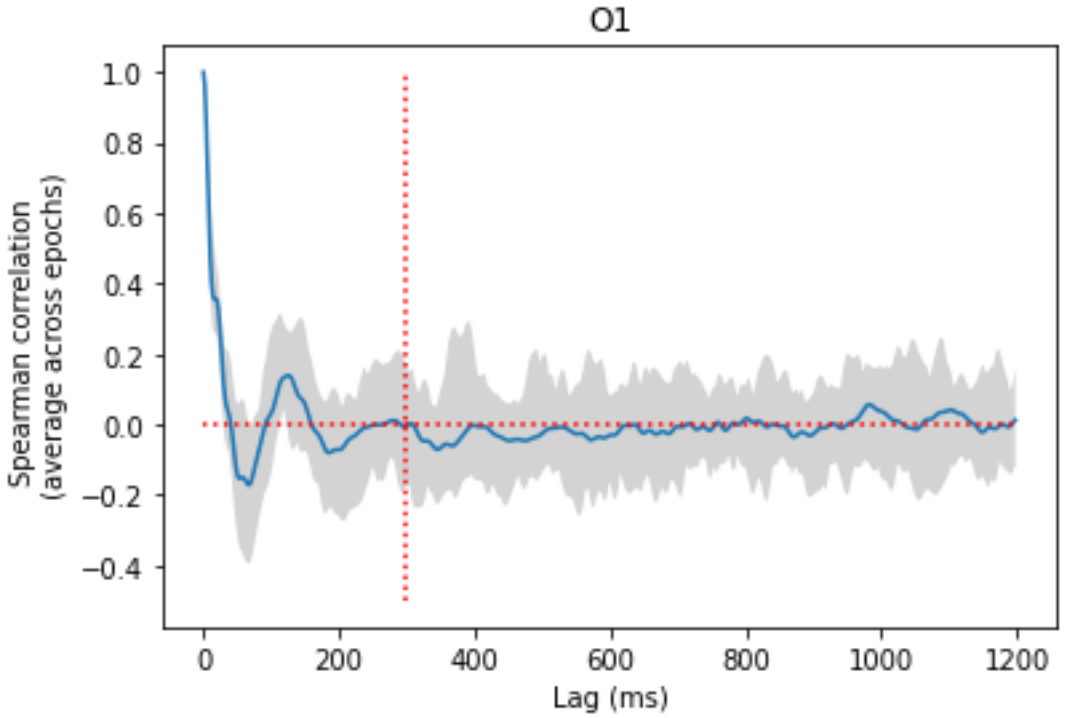
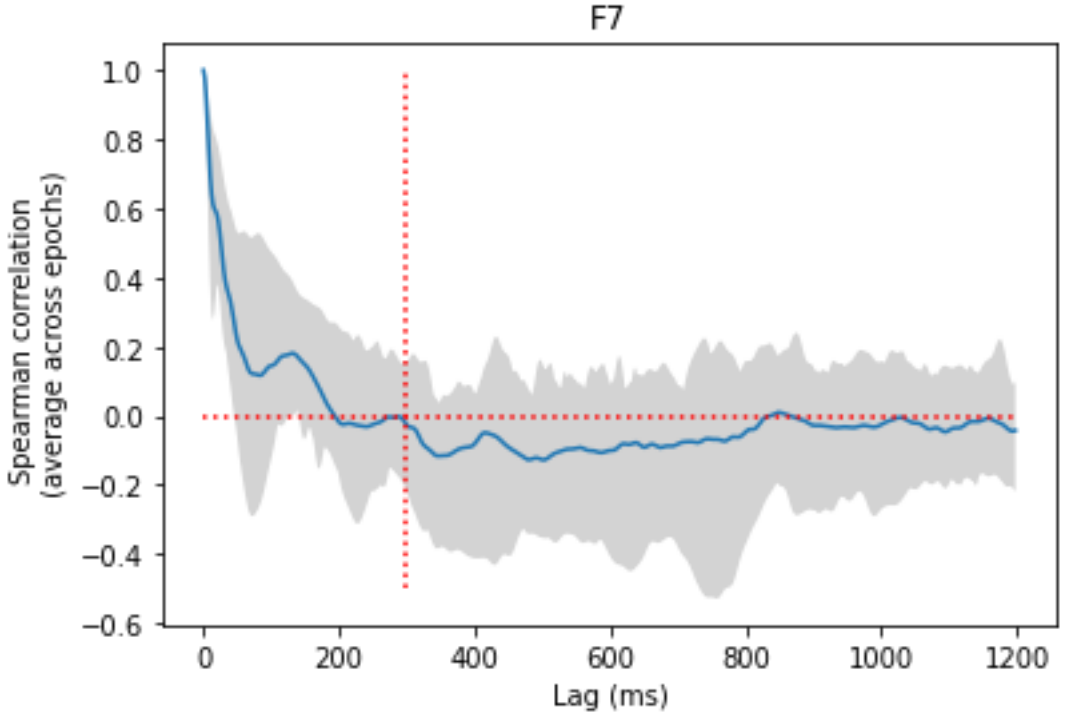
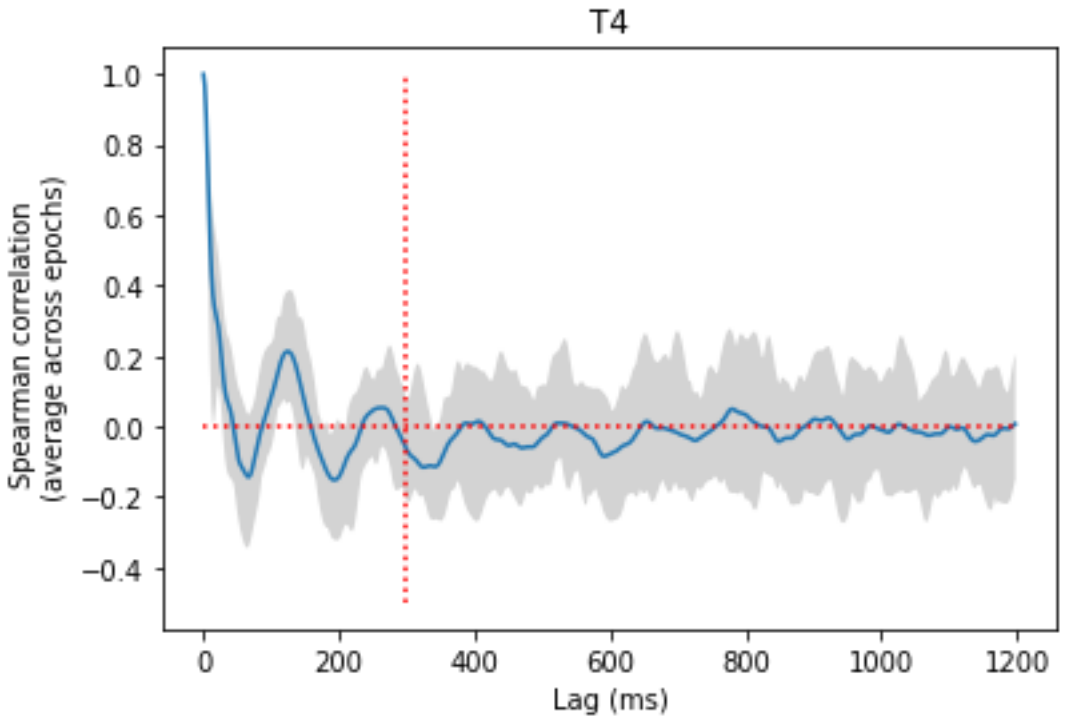
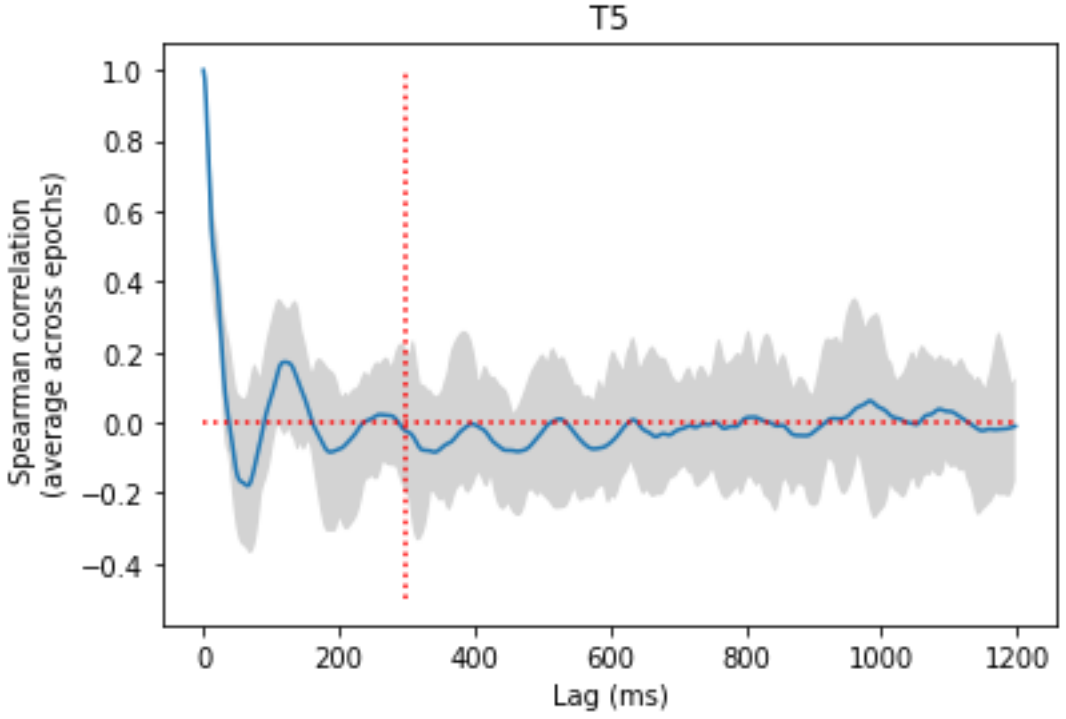
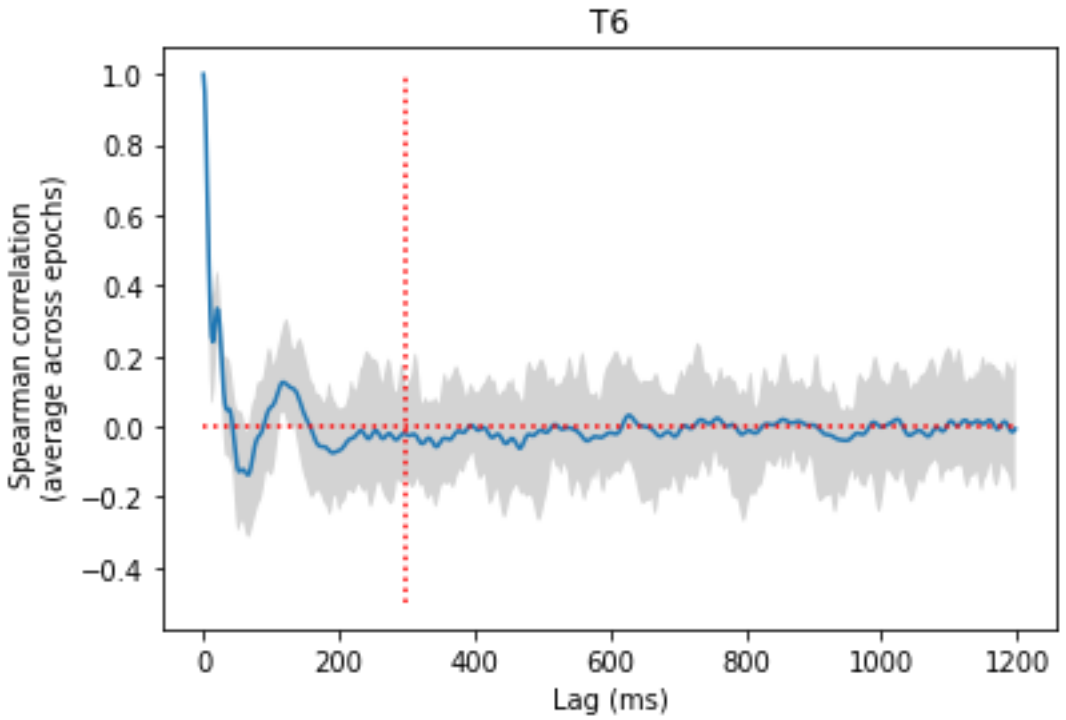
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

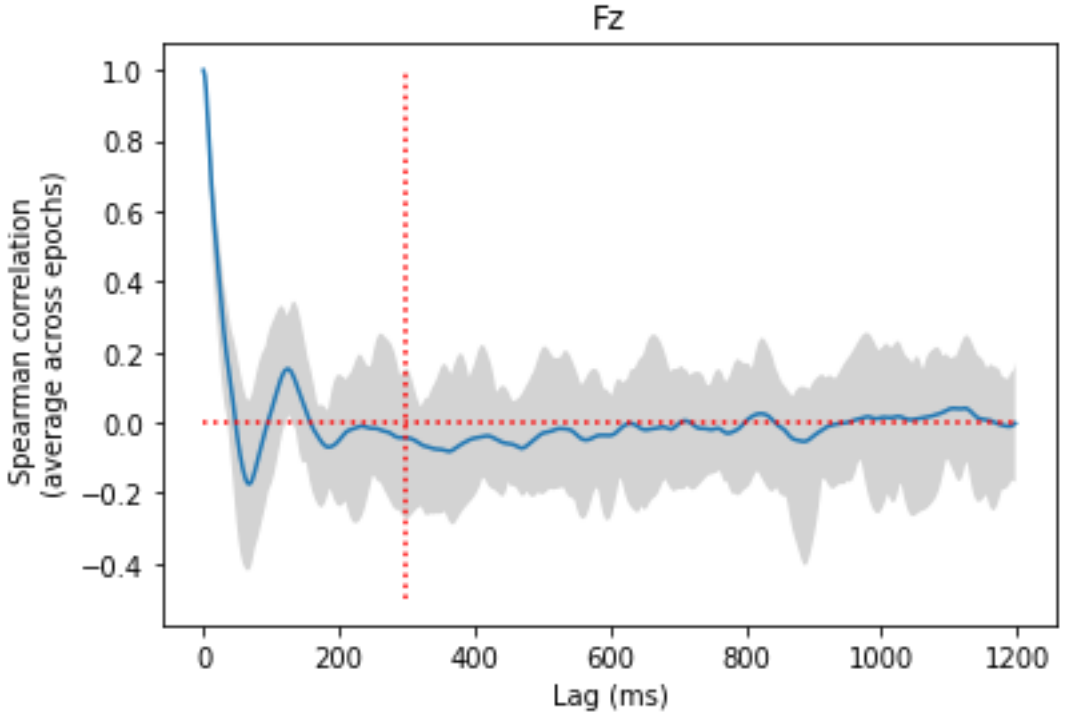

O1
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

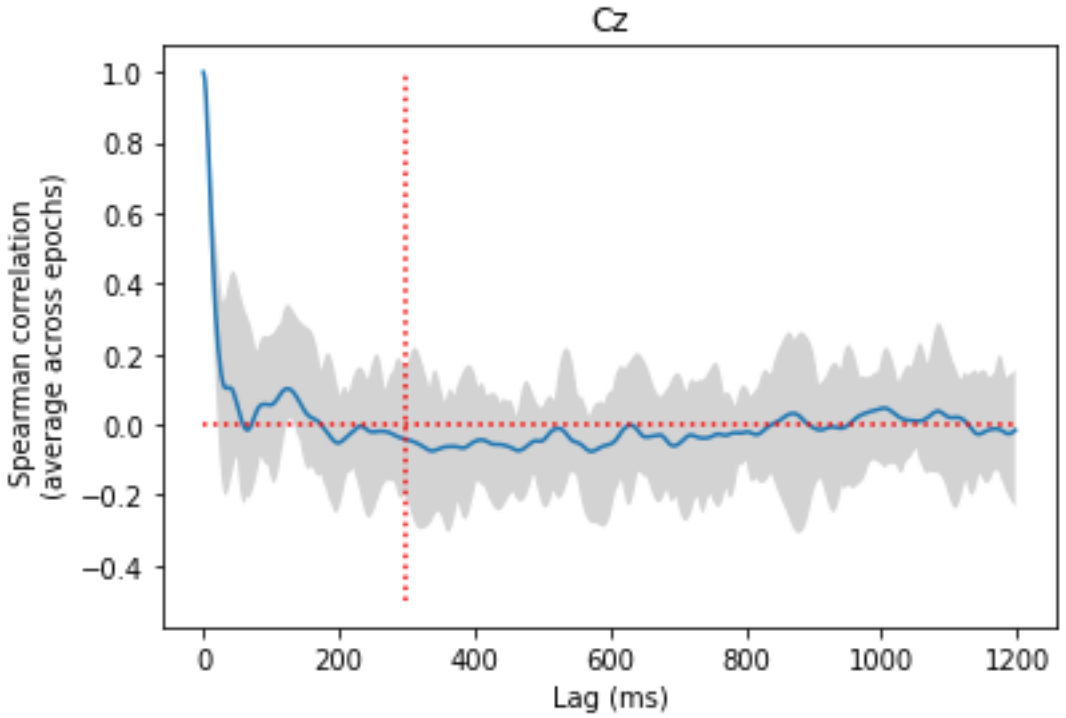

F7
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800
1000
1200
Lag (ms)

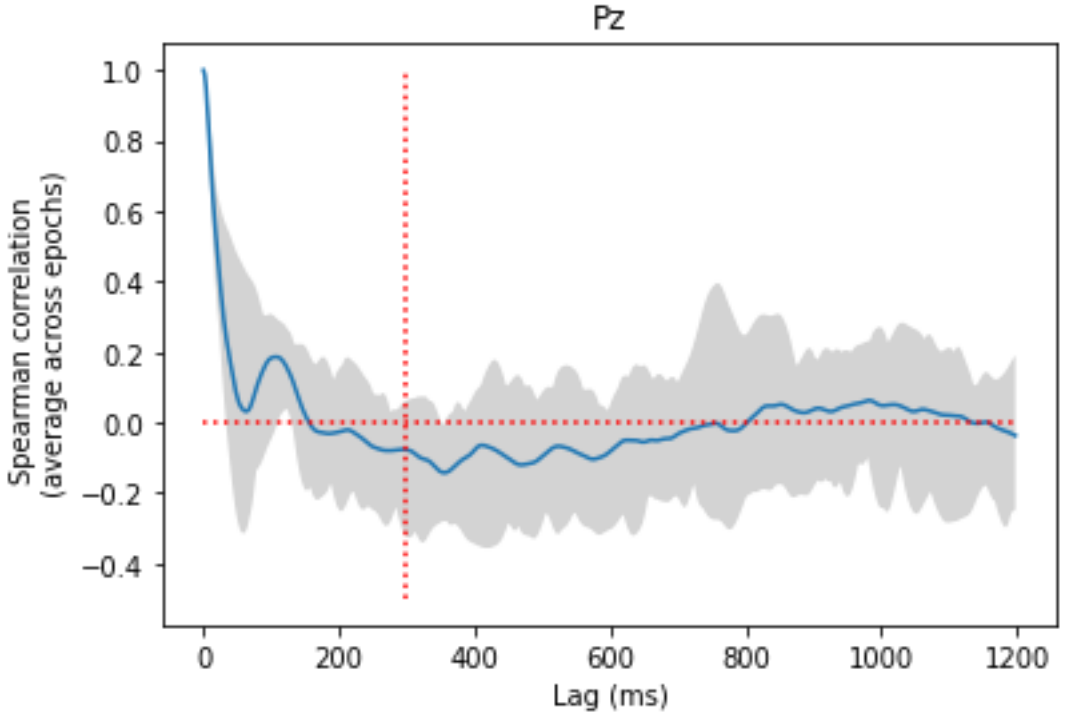

T4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


T5
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

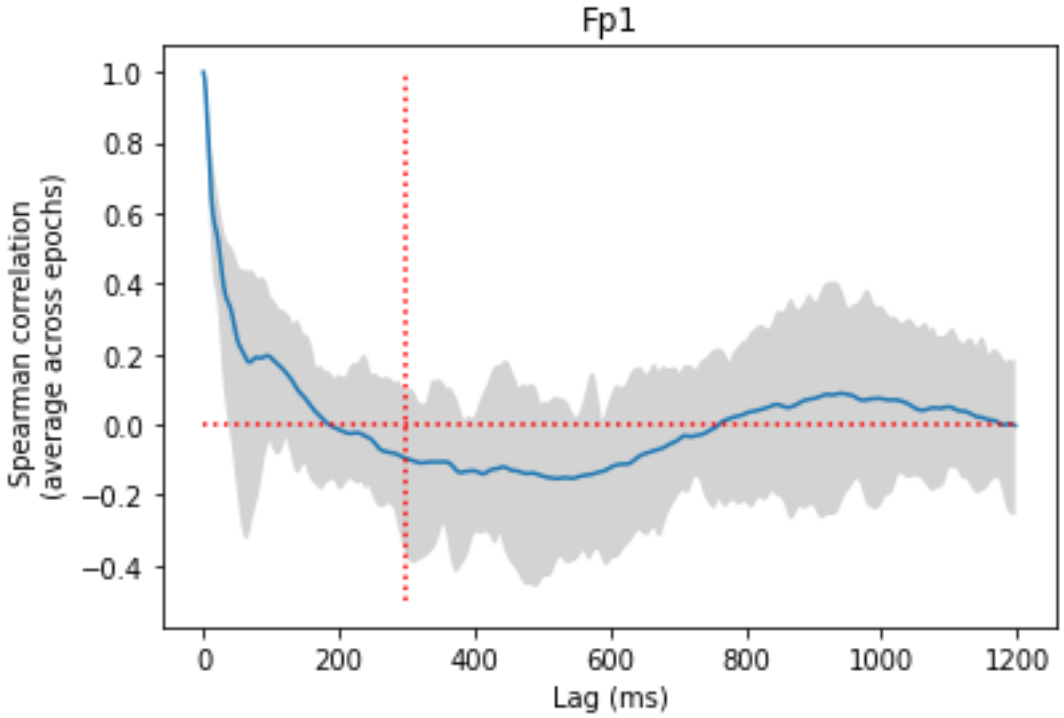

T6
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

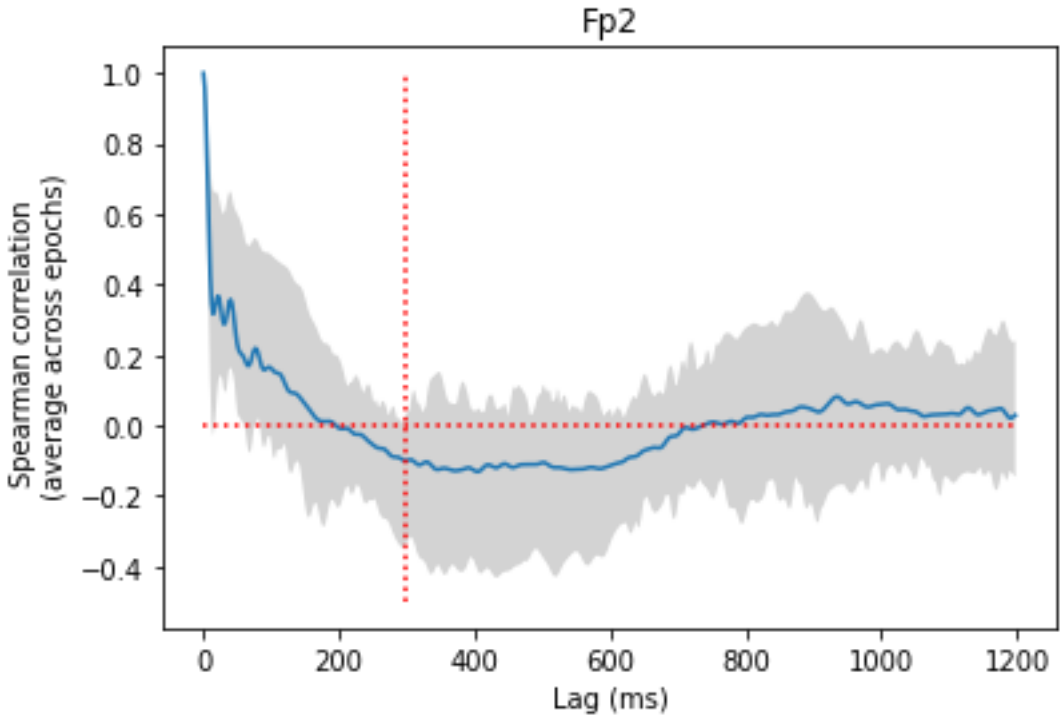

Fz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

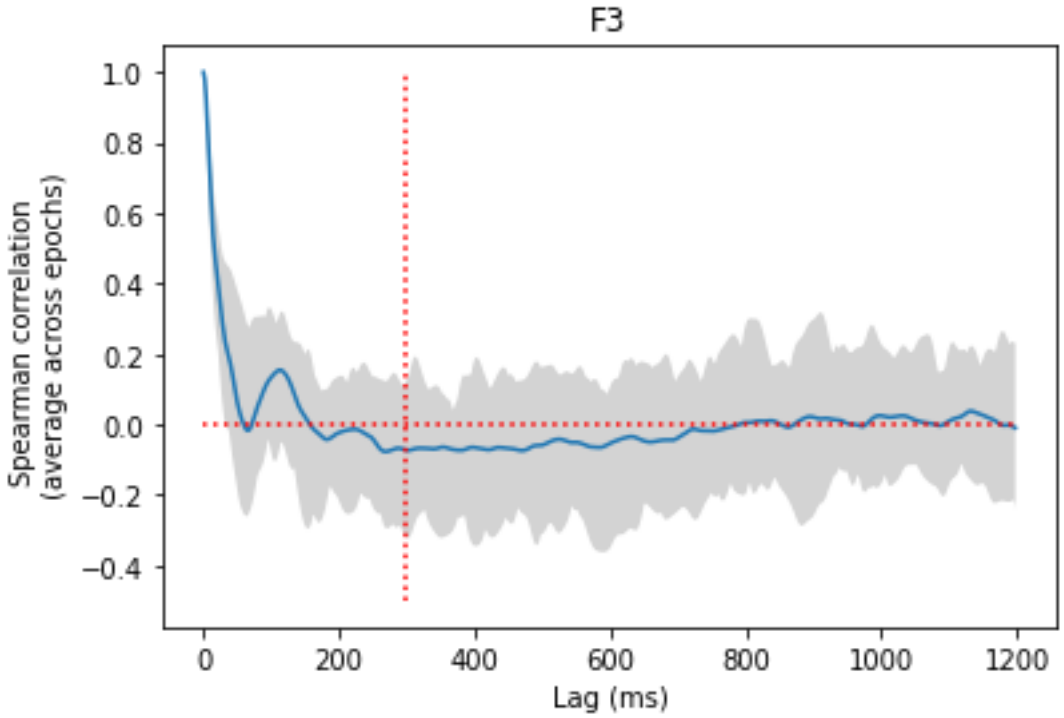

Cz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

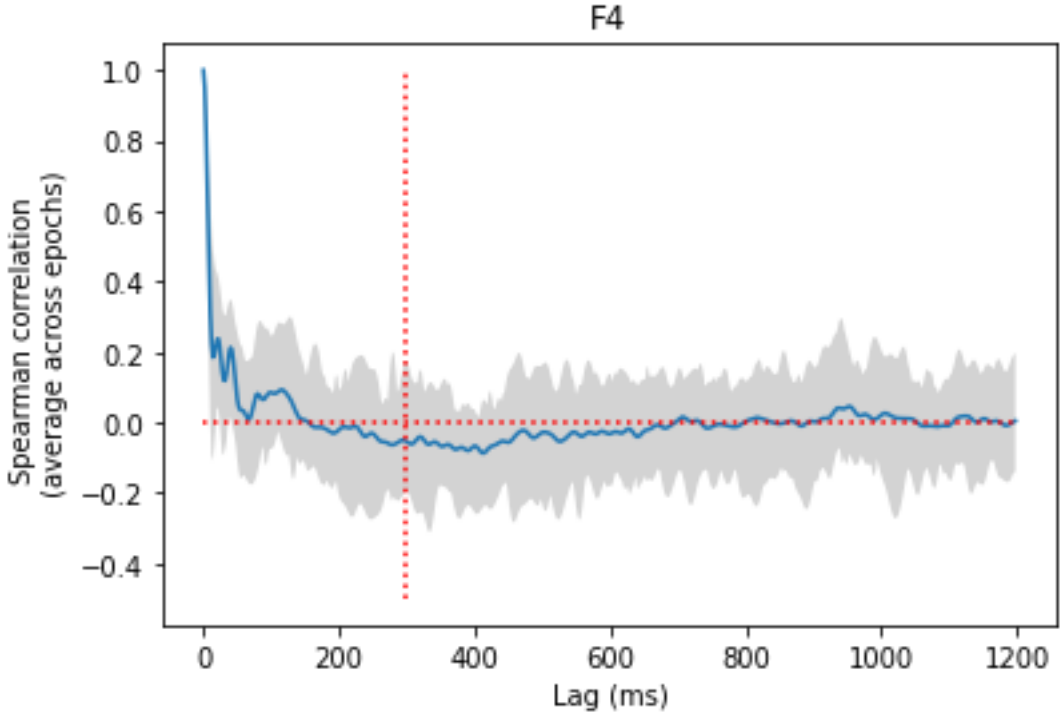

Pz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

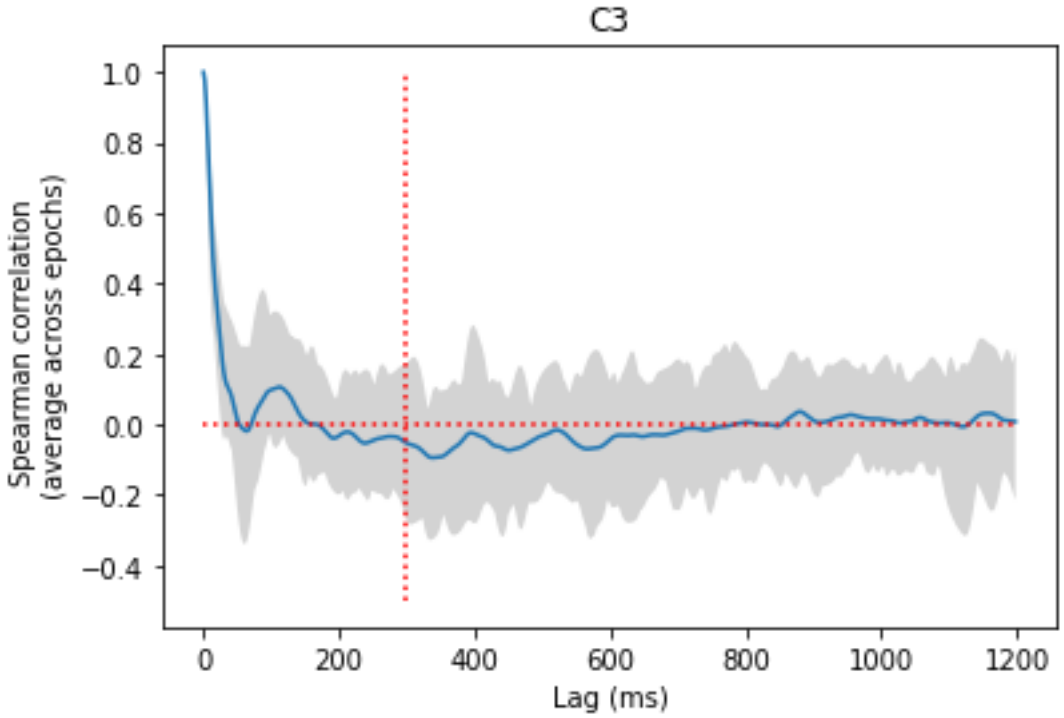
DBS OFF: Motion

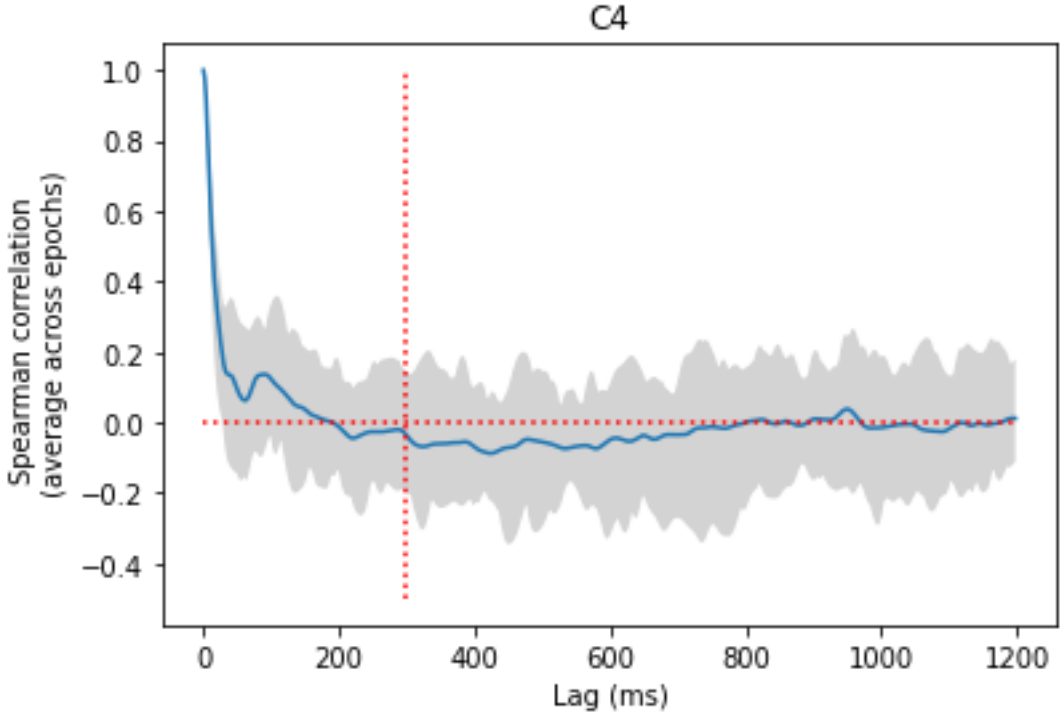


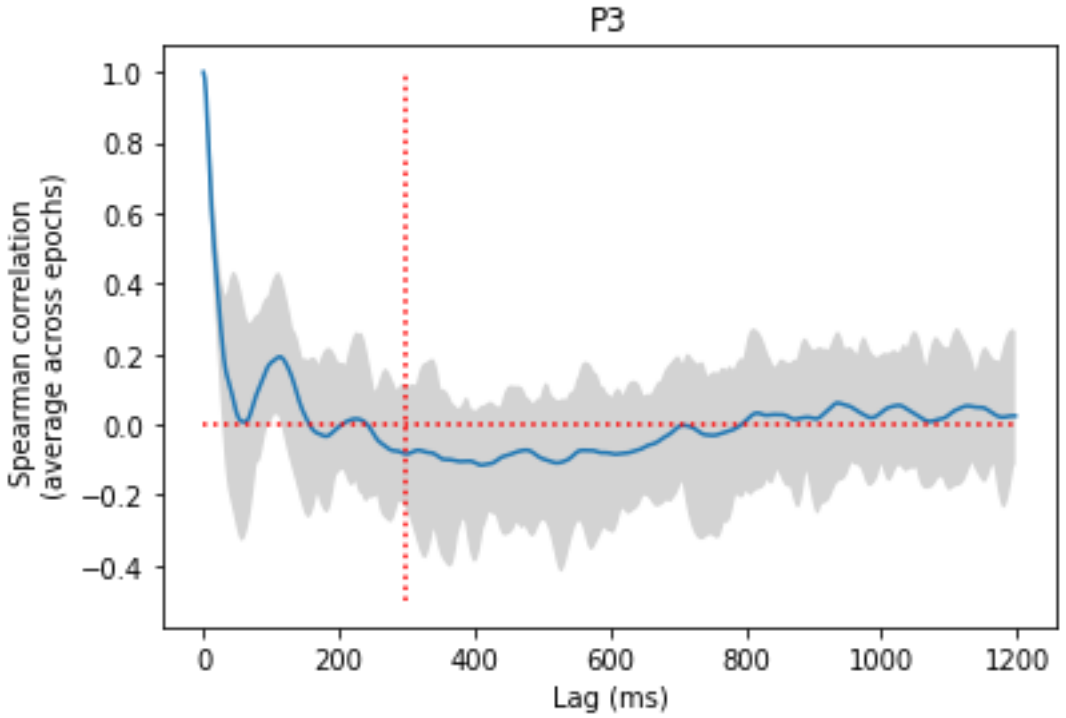


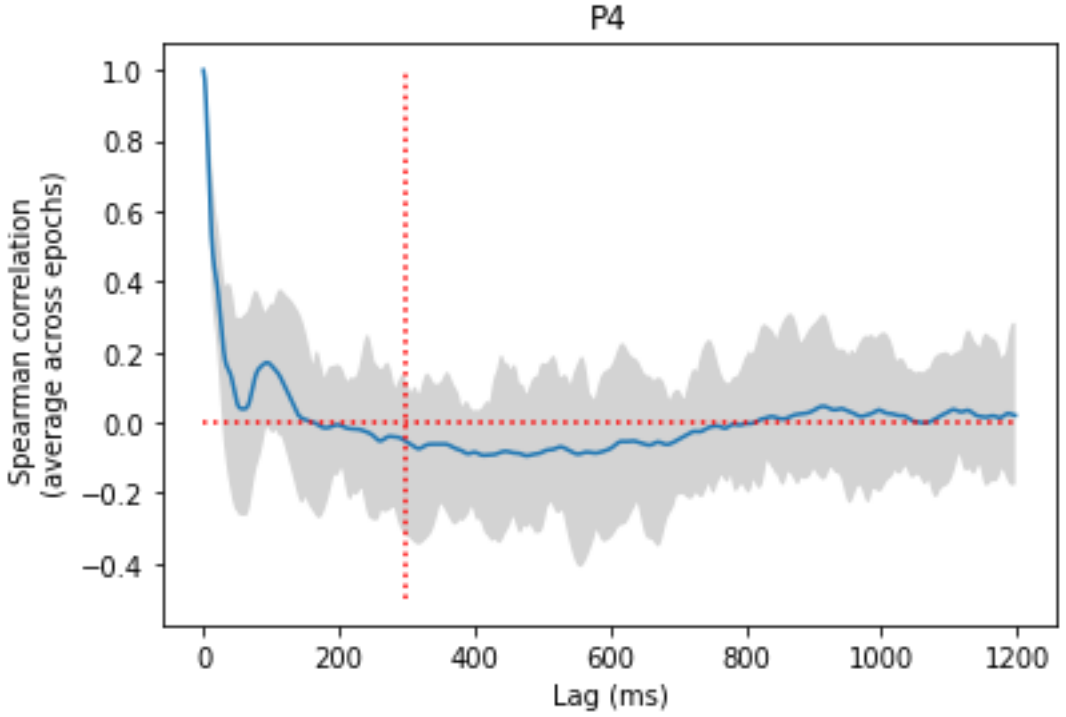

F3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

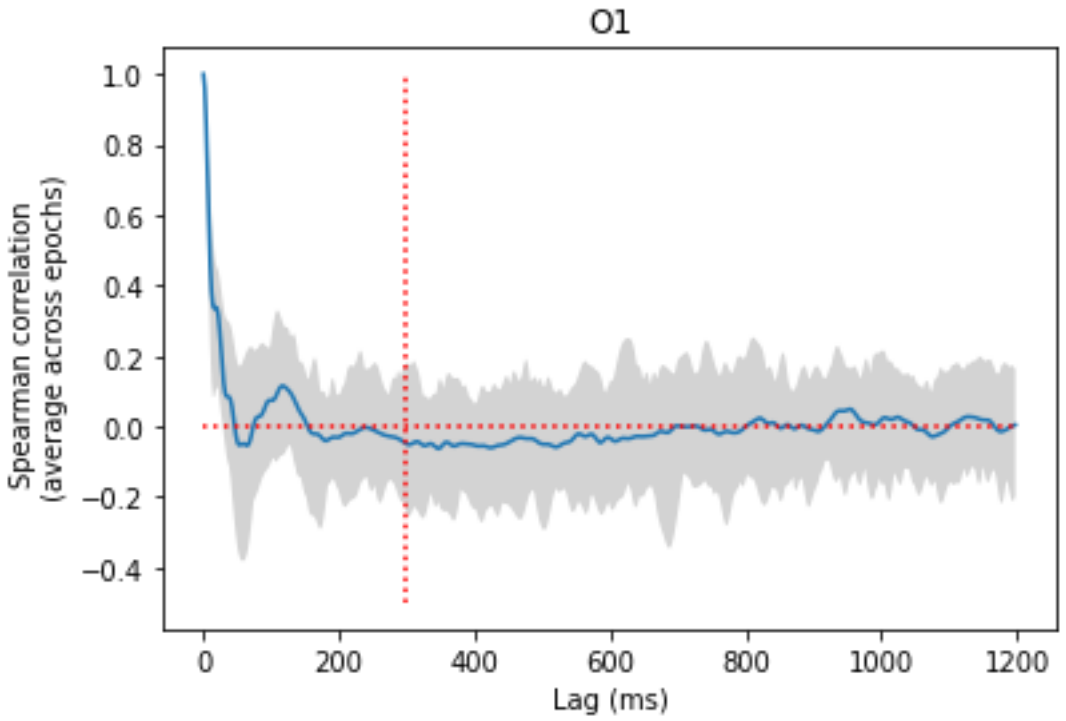

F4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

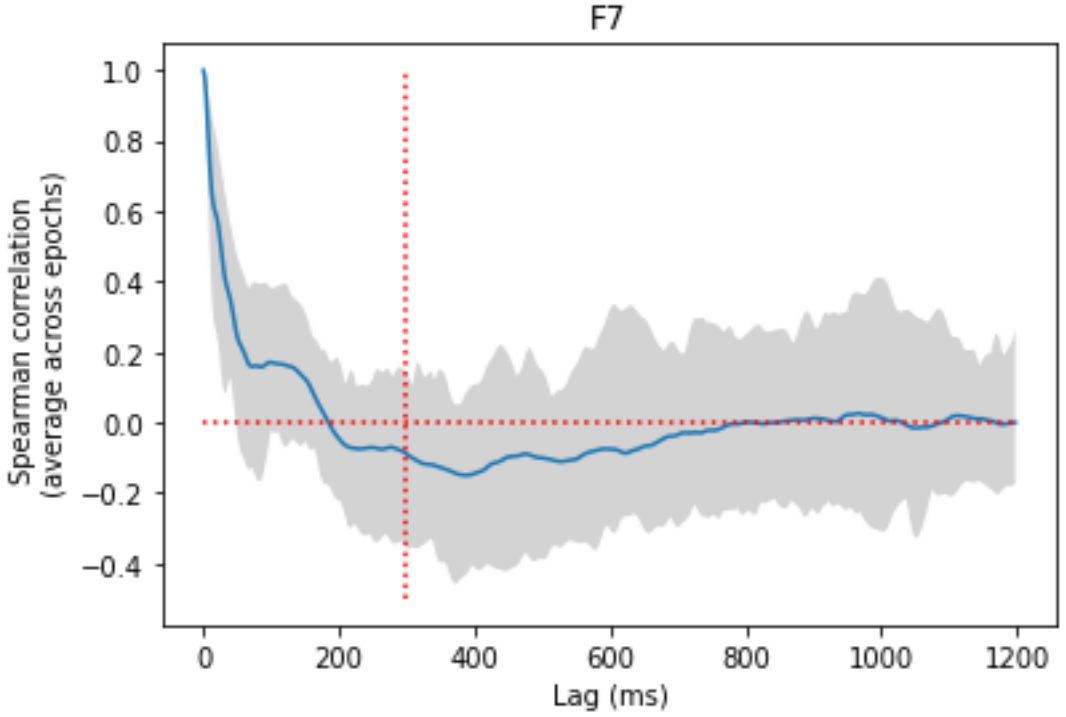

C3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

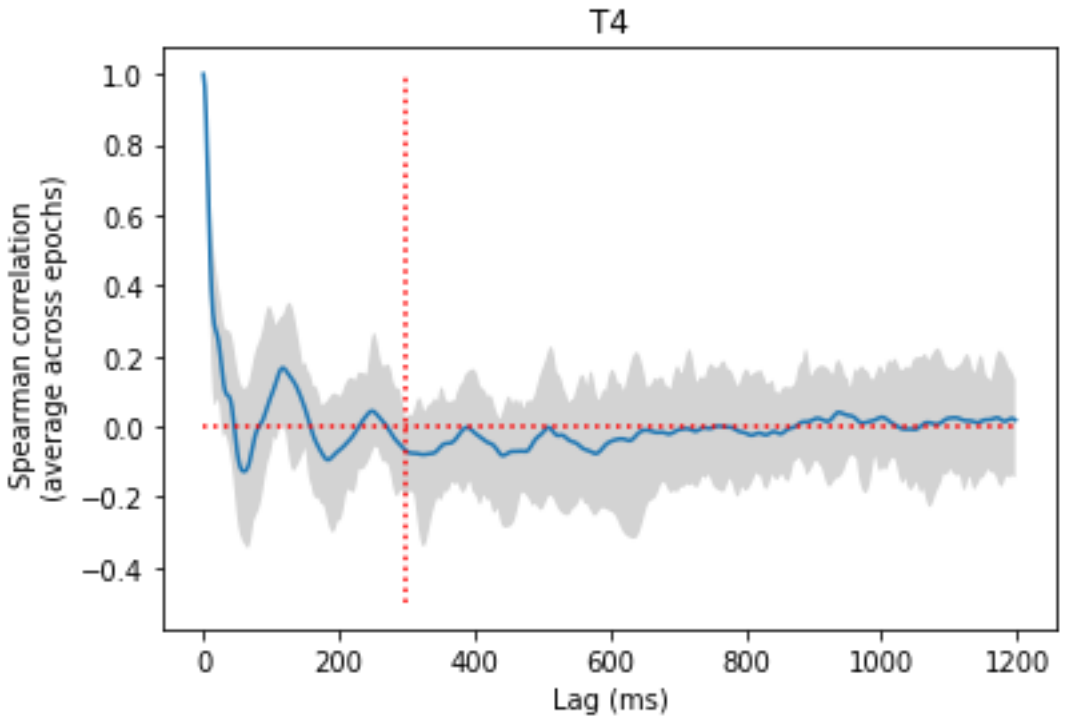

C4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

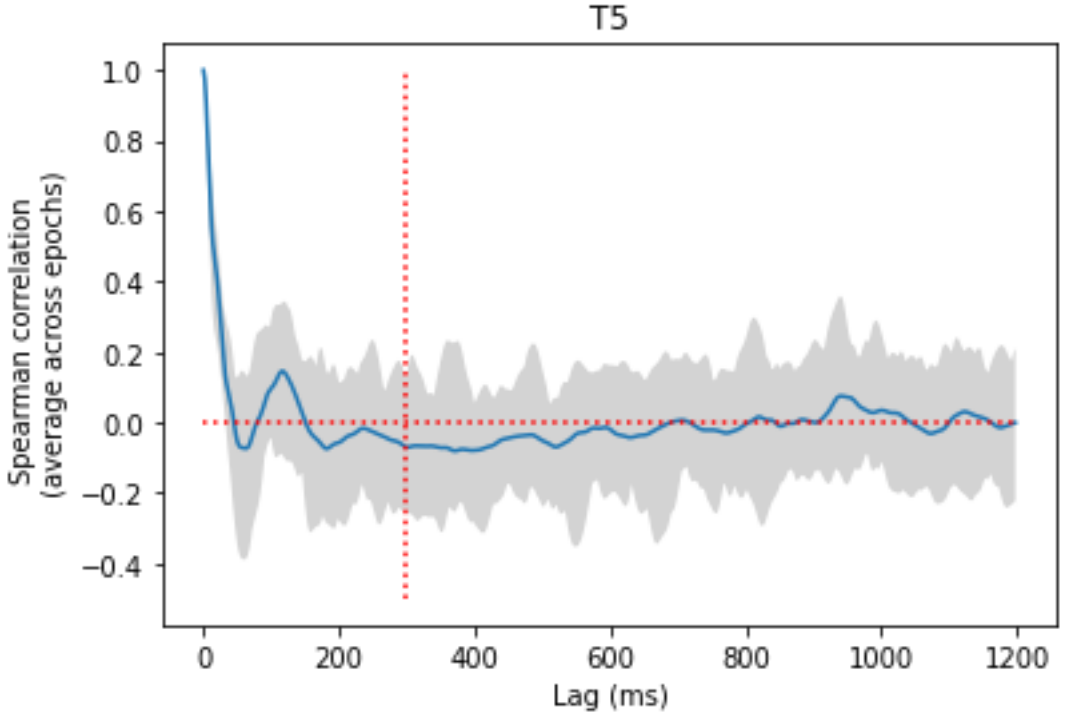

P3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

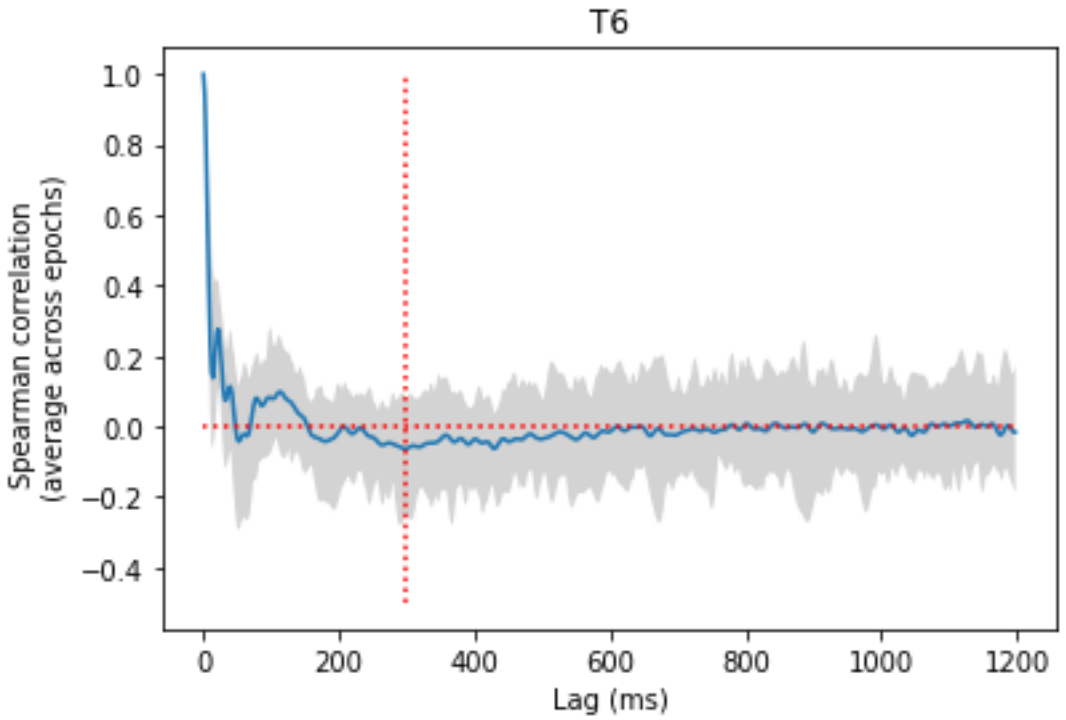

P4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

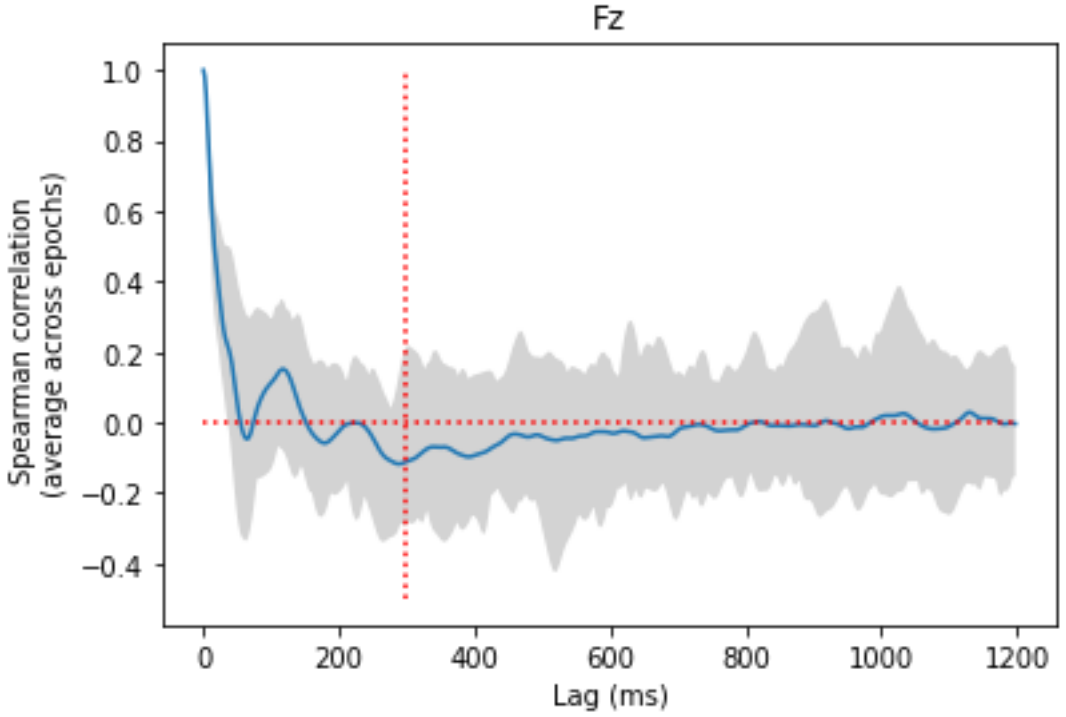

O1
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

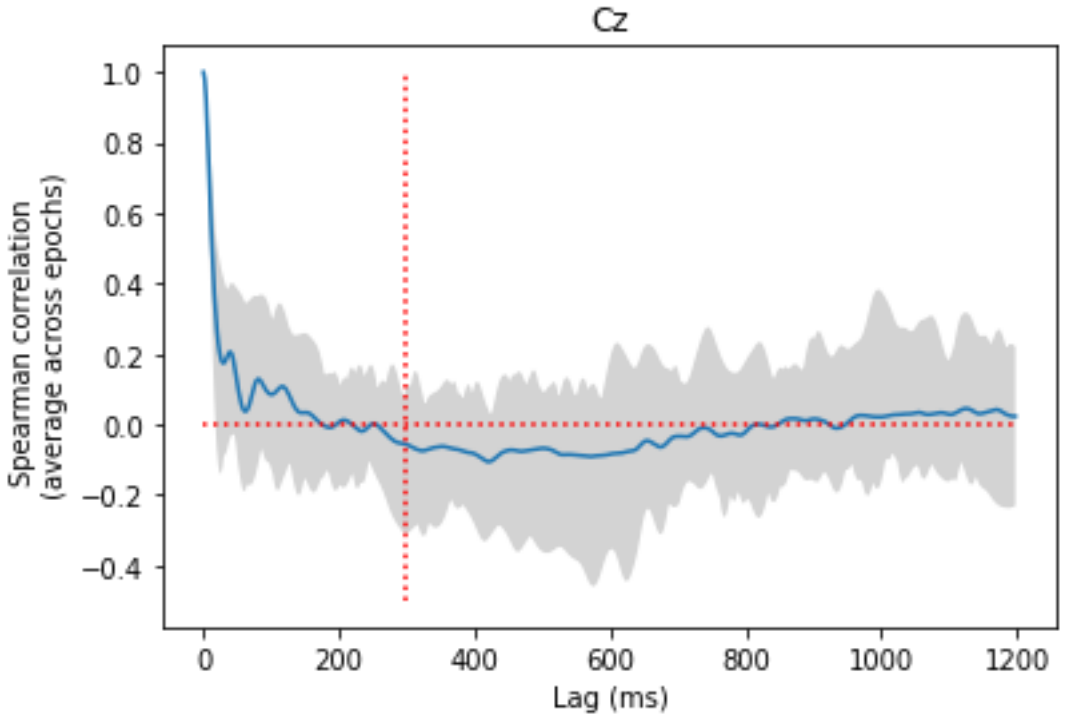

F7
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

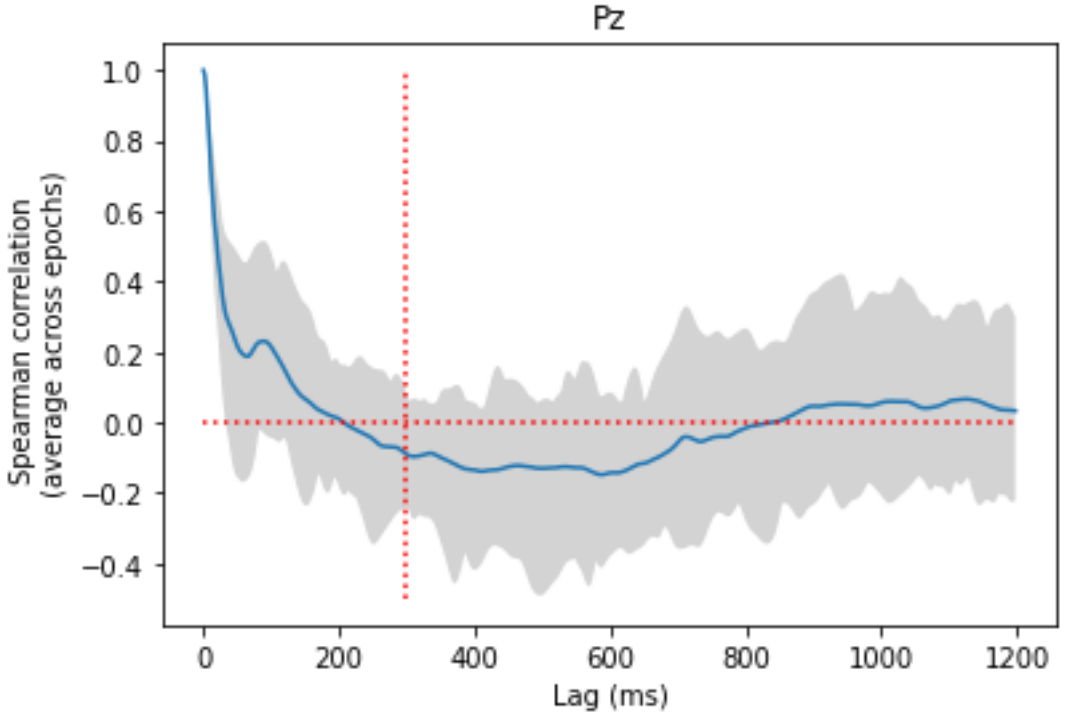

T4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


T5
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

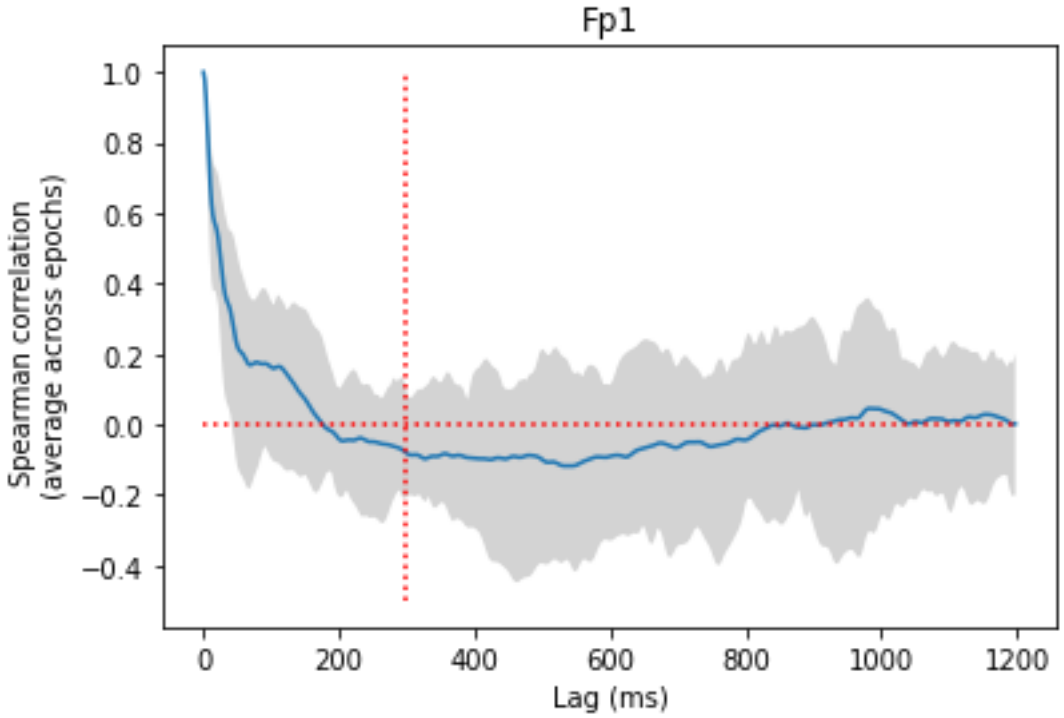

T6
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

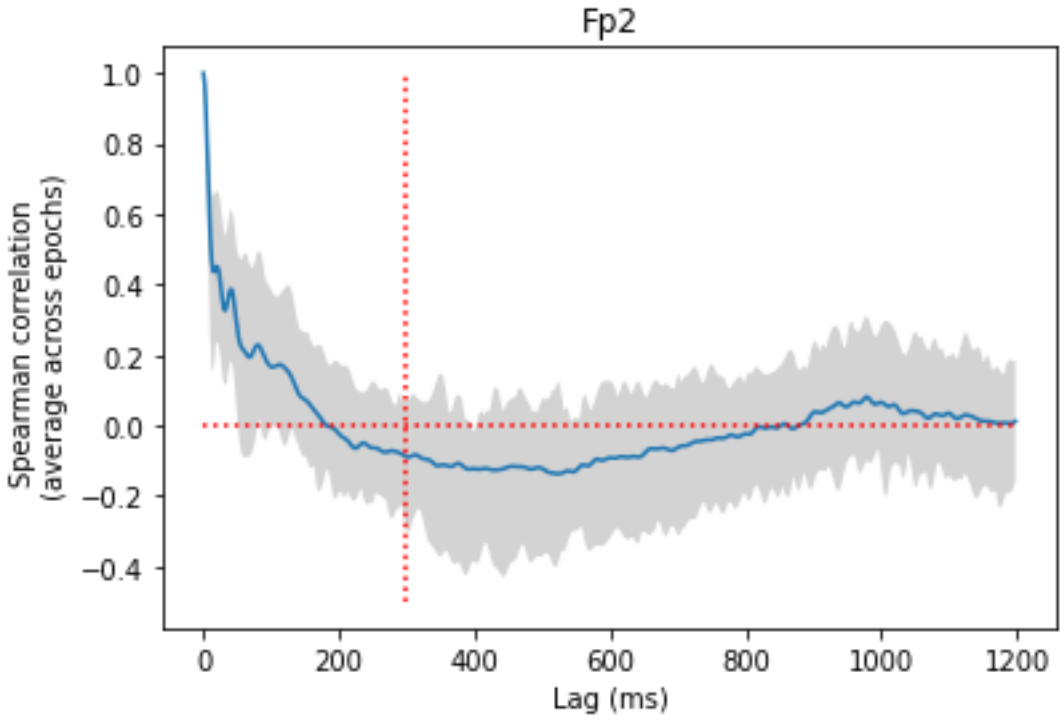

Fz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

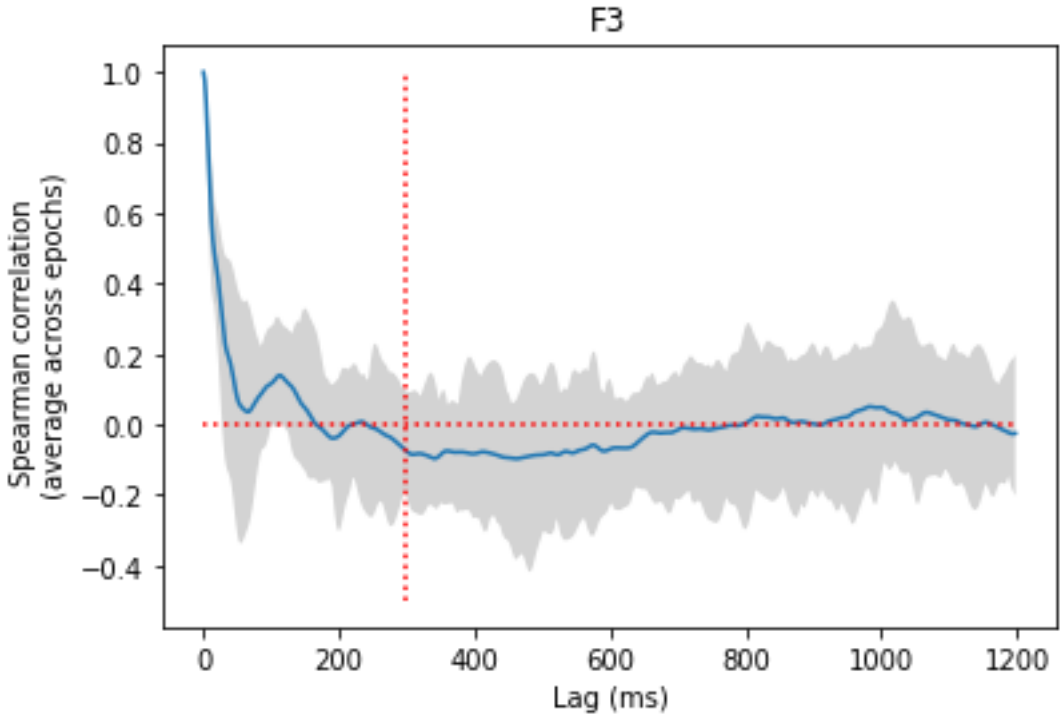

Cz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

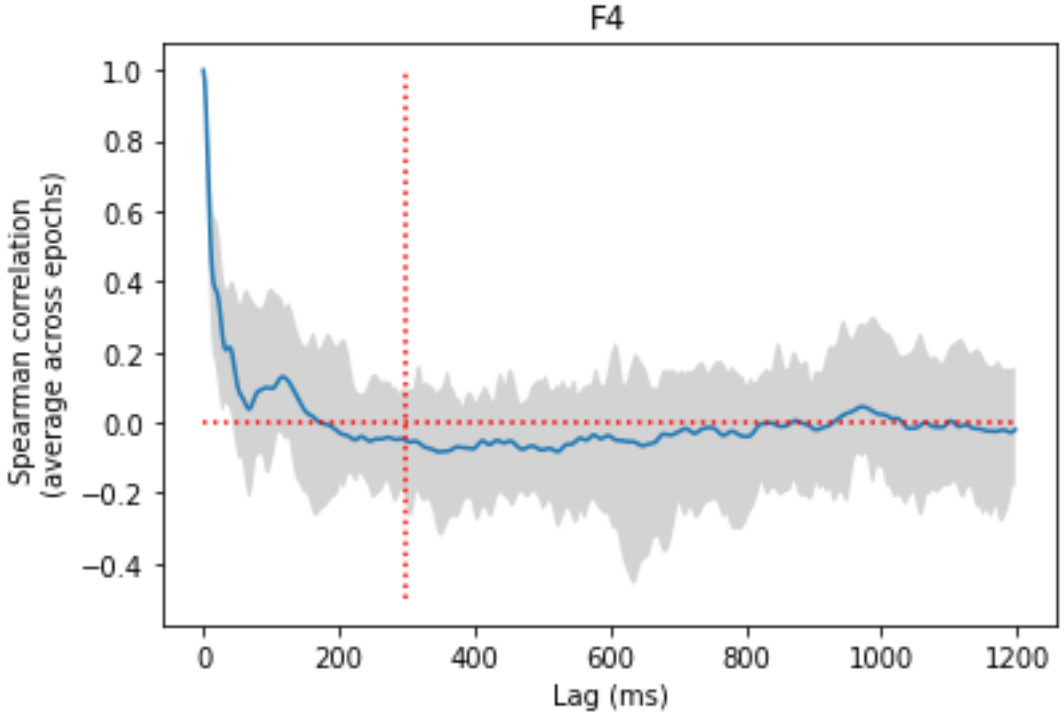

Pz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

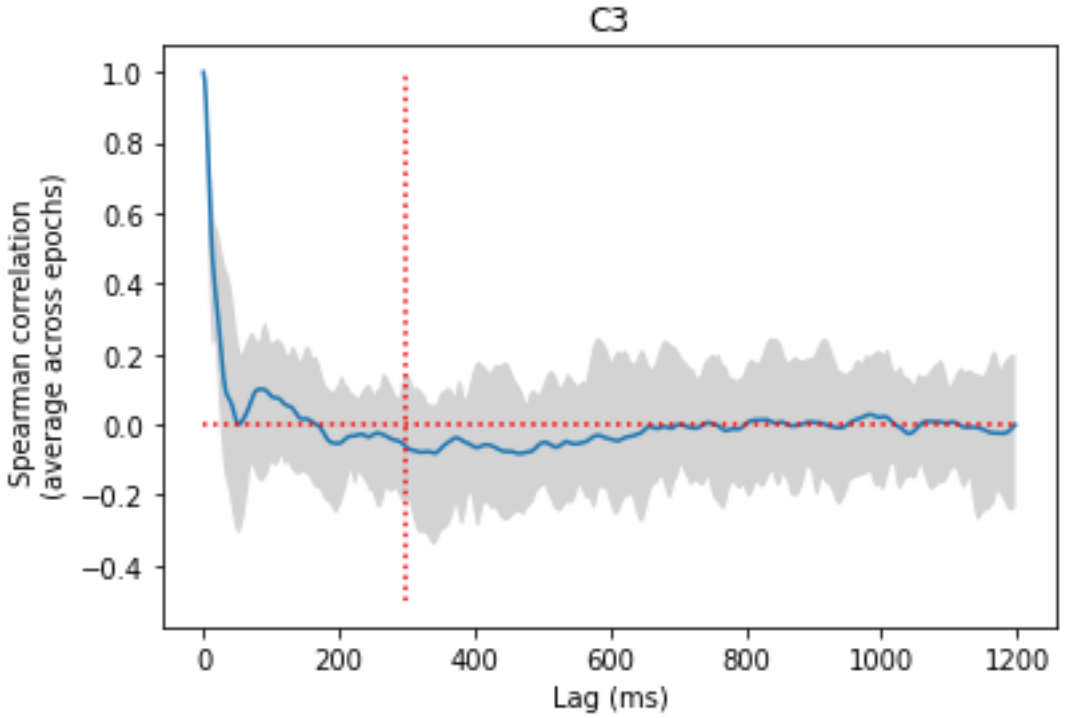
DBS ON: Motion

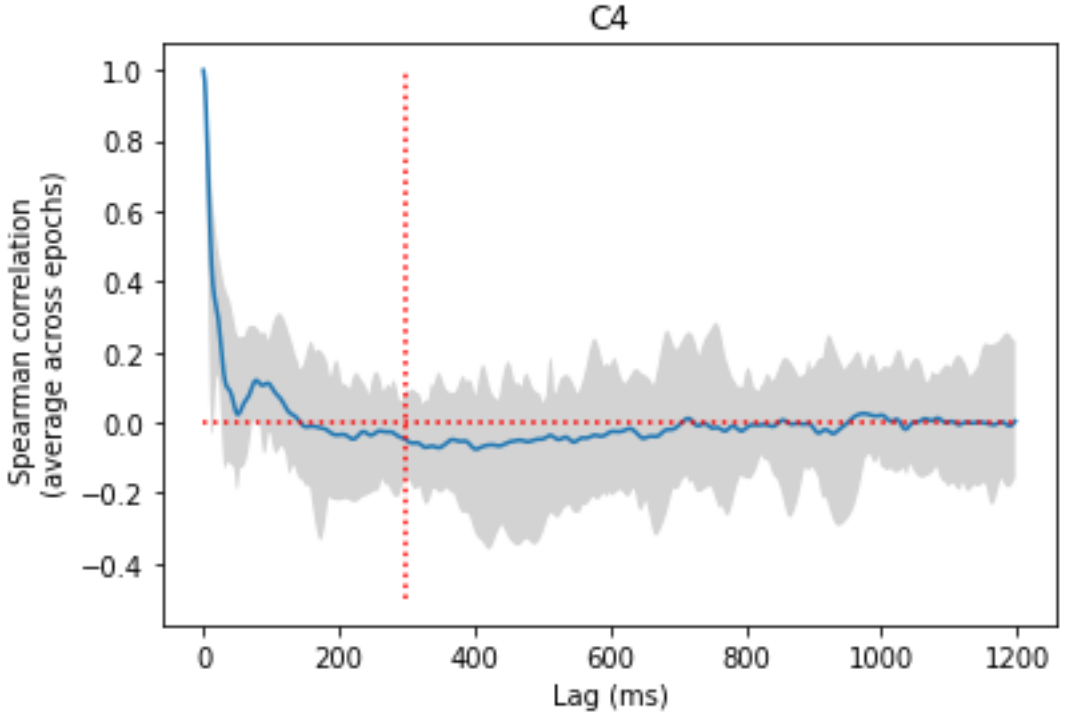


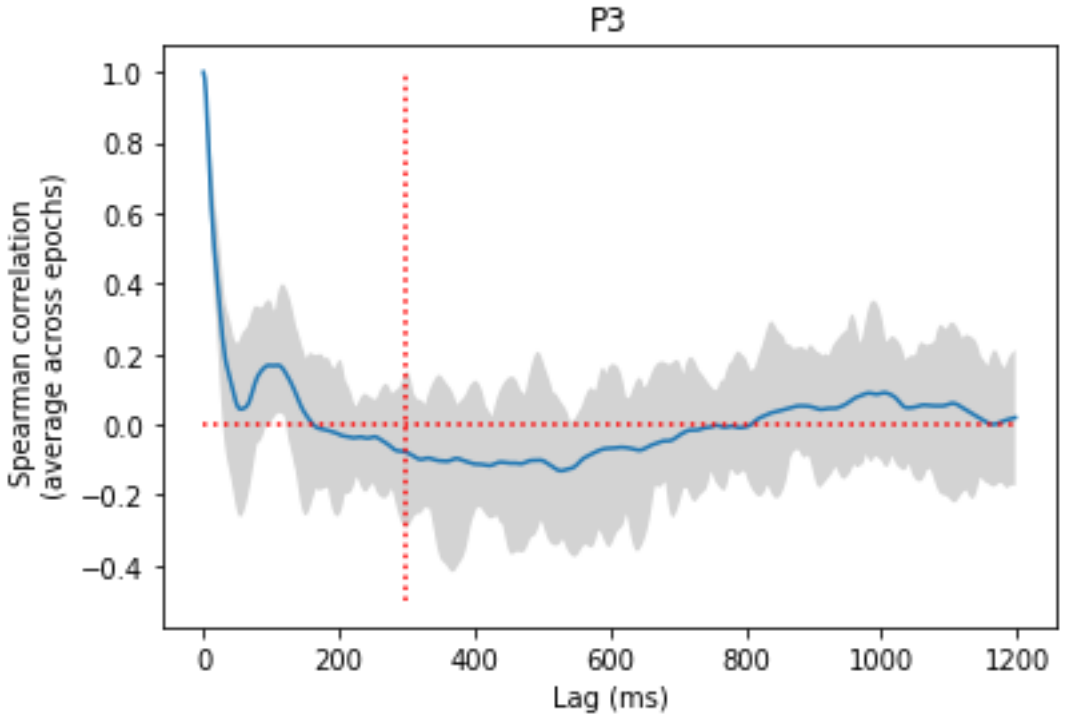


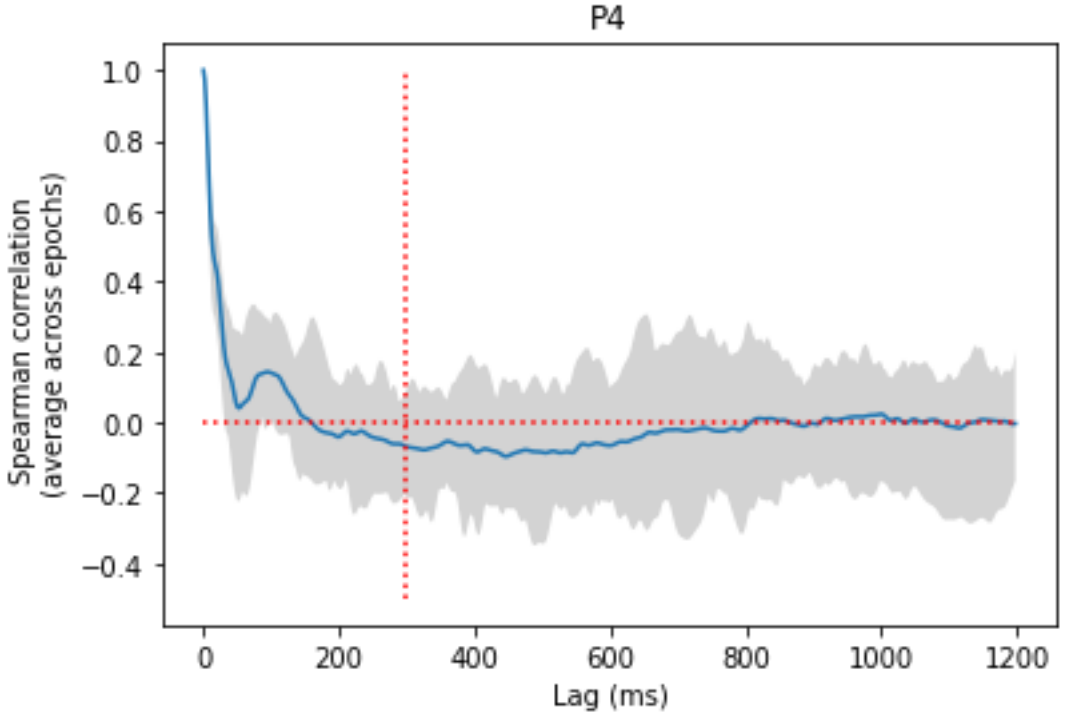

F3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

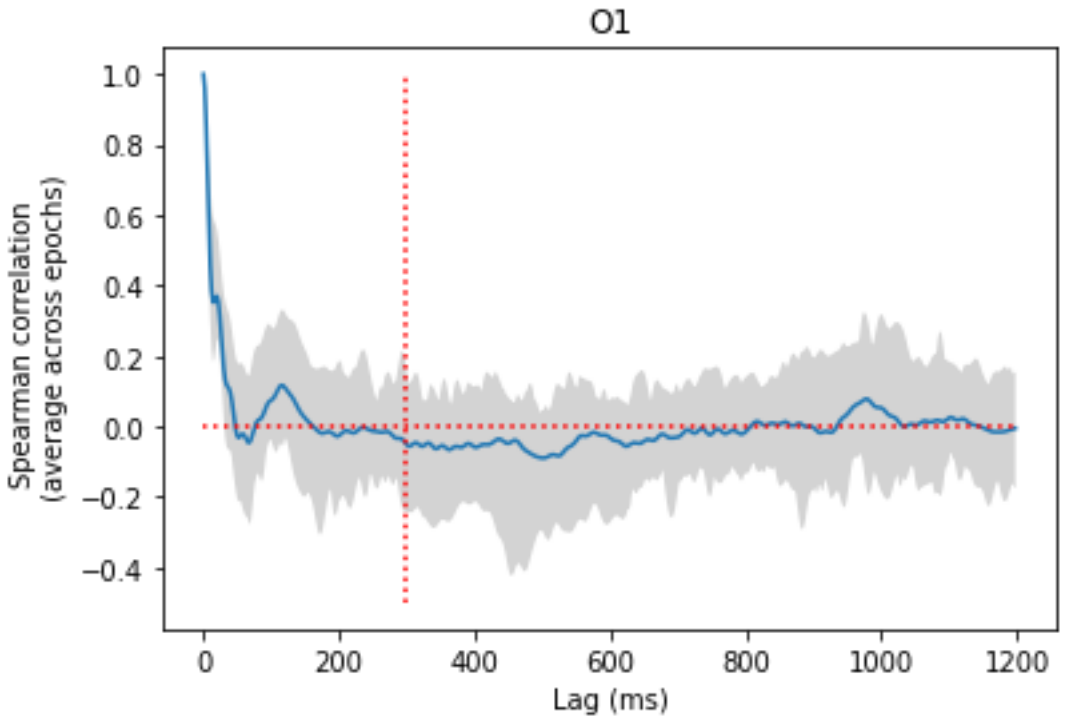

F4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

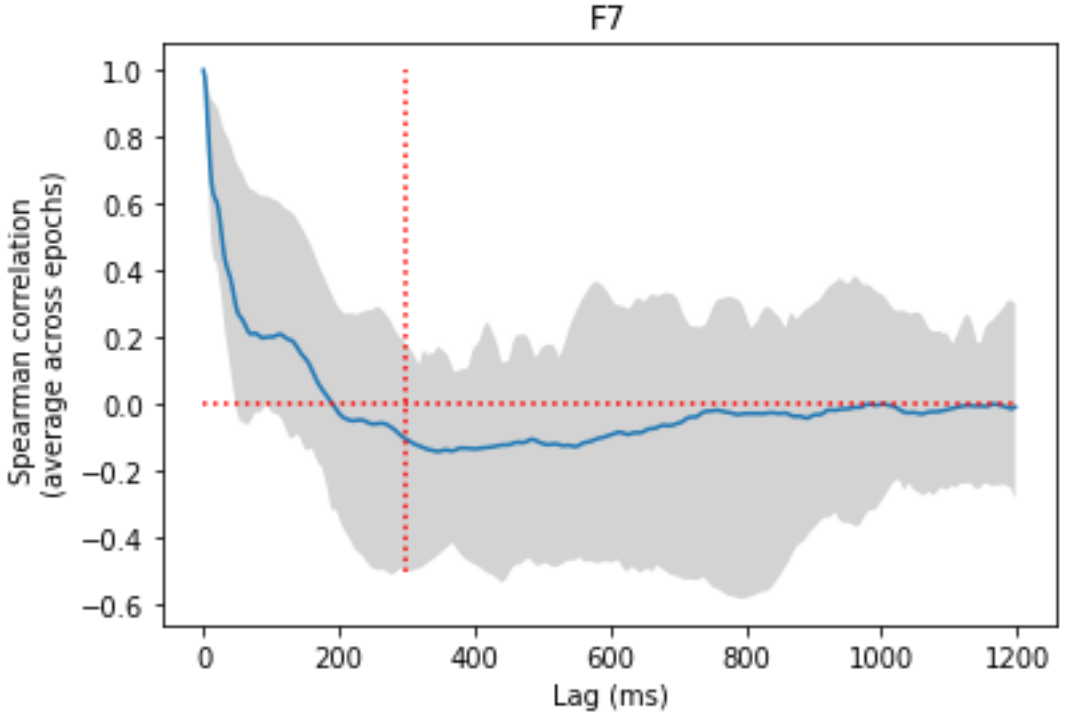

C3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

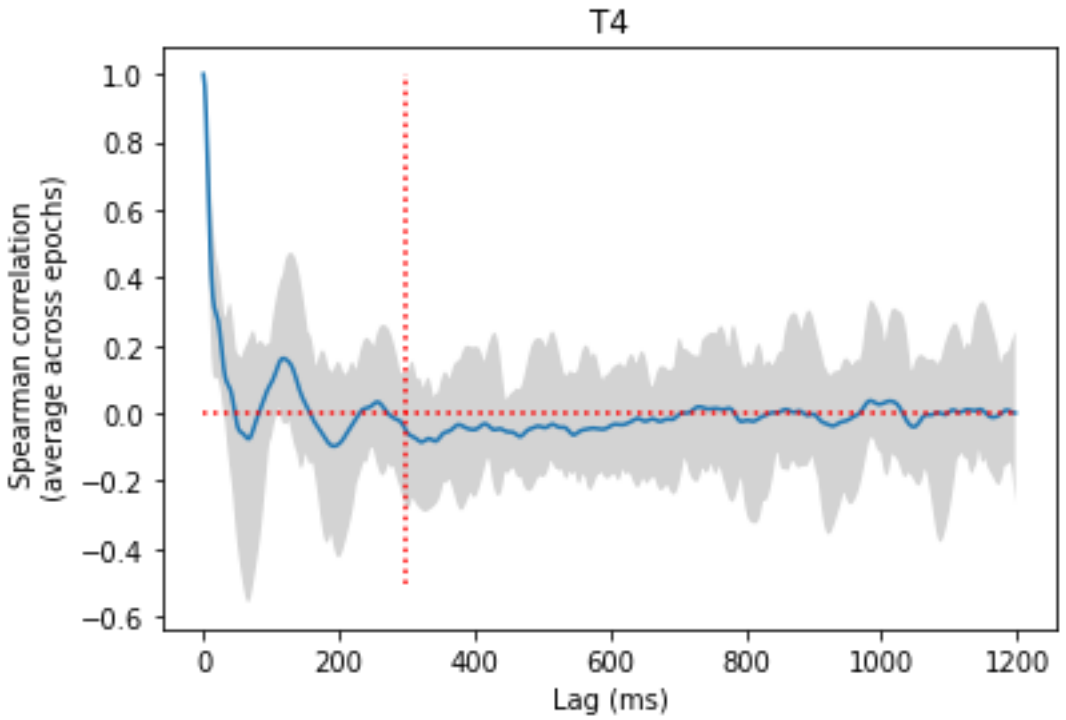

C4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

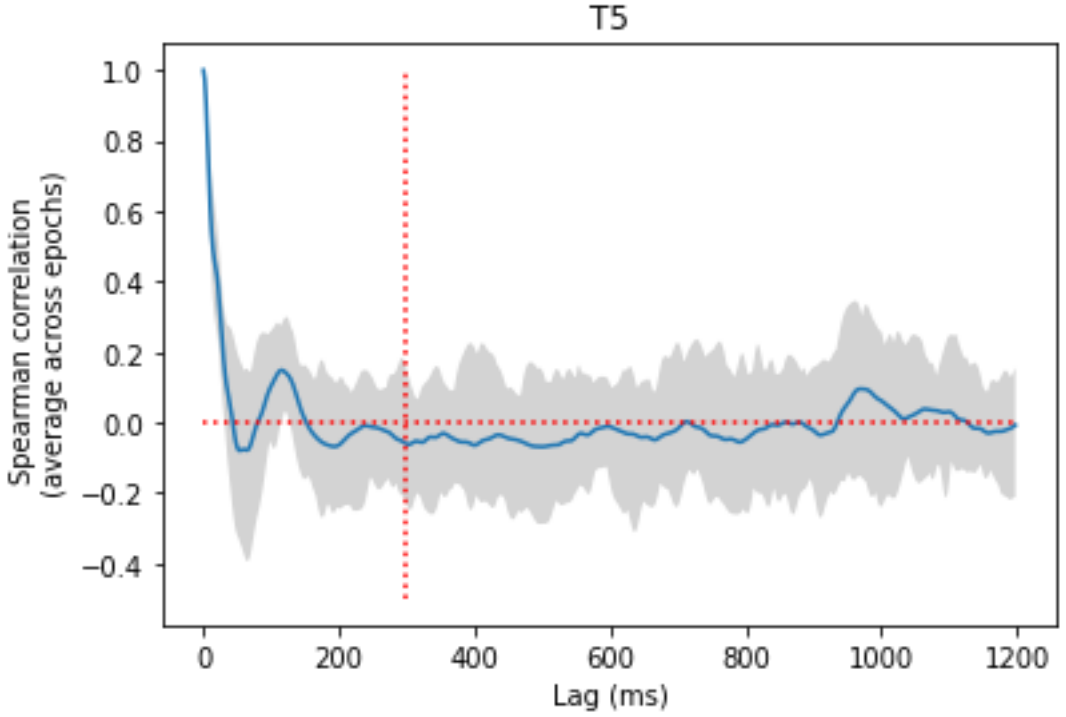

P3
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

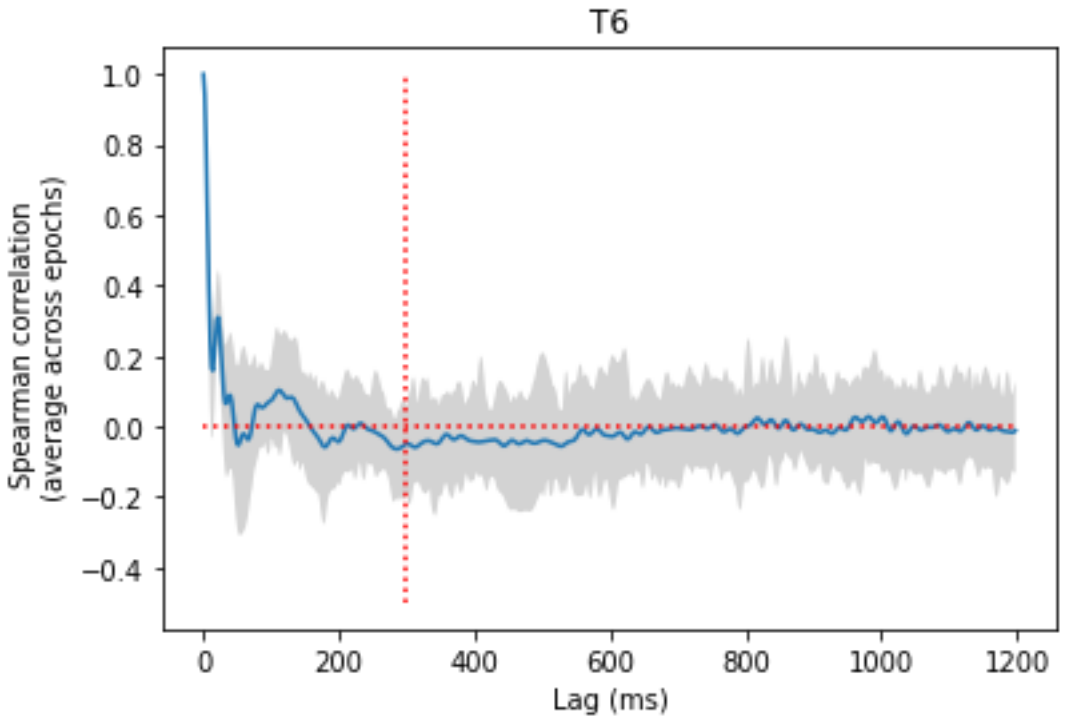

P4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

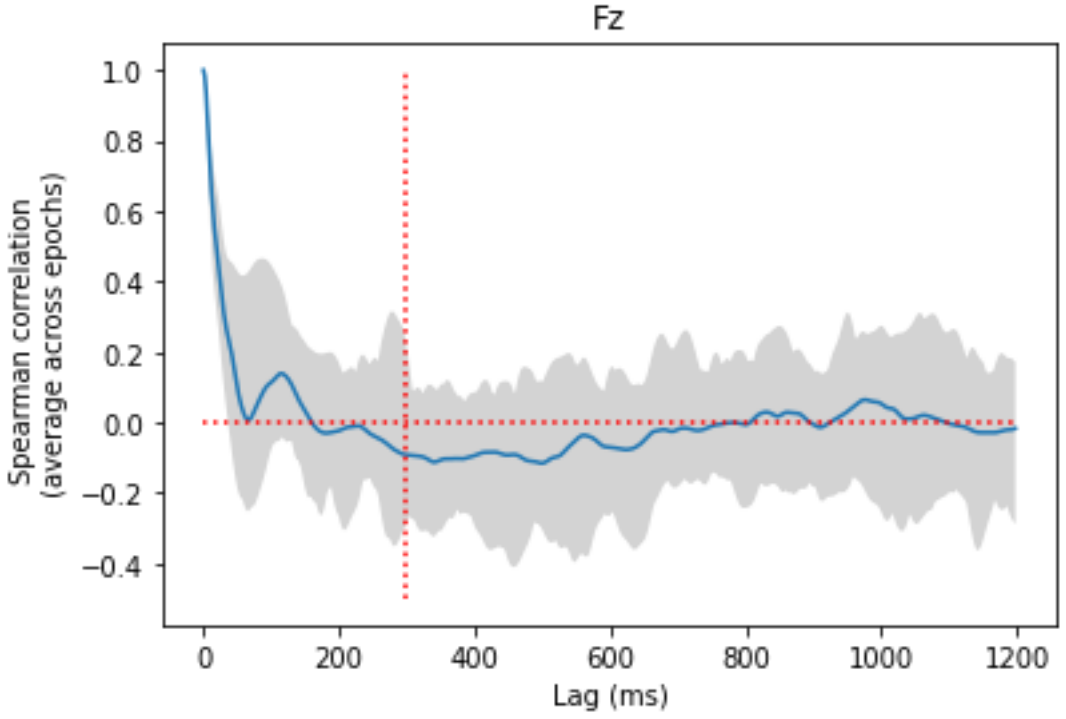

O1
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)

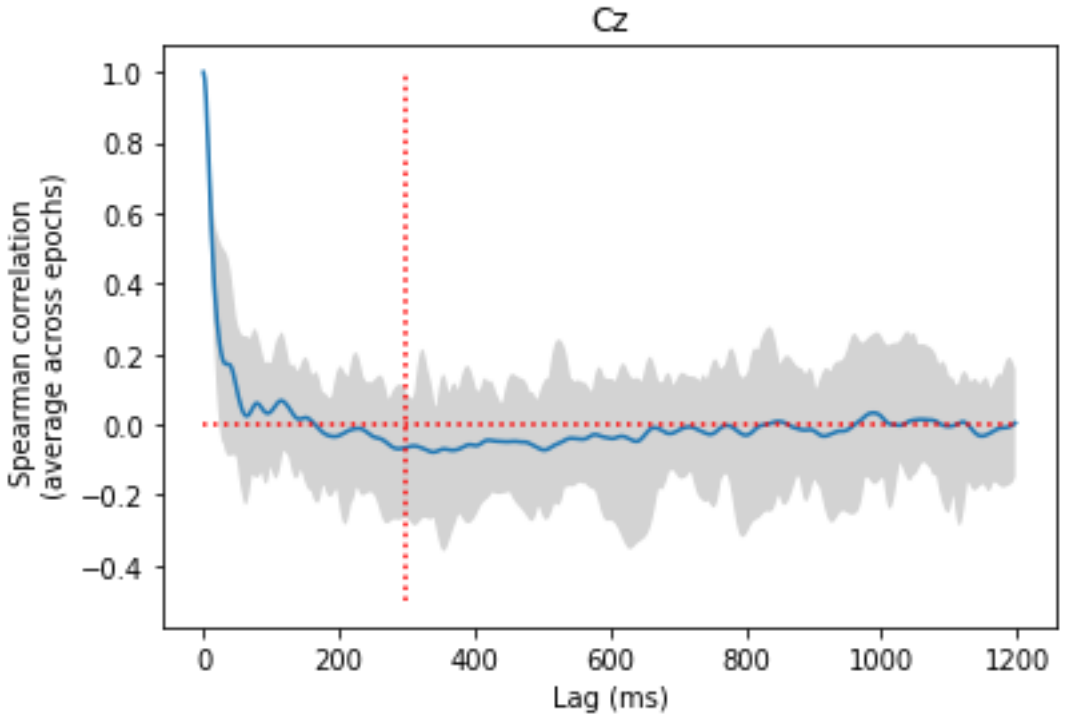

F7
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800
1000
1200
Lag (ms)

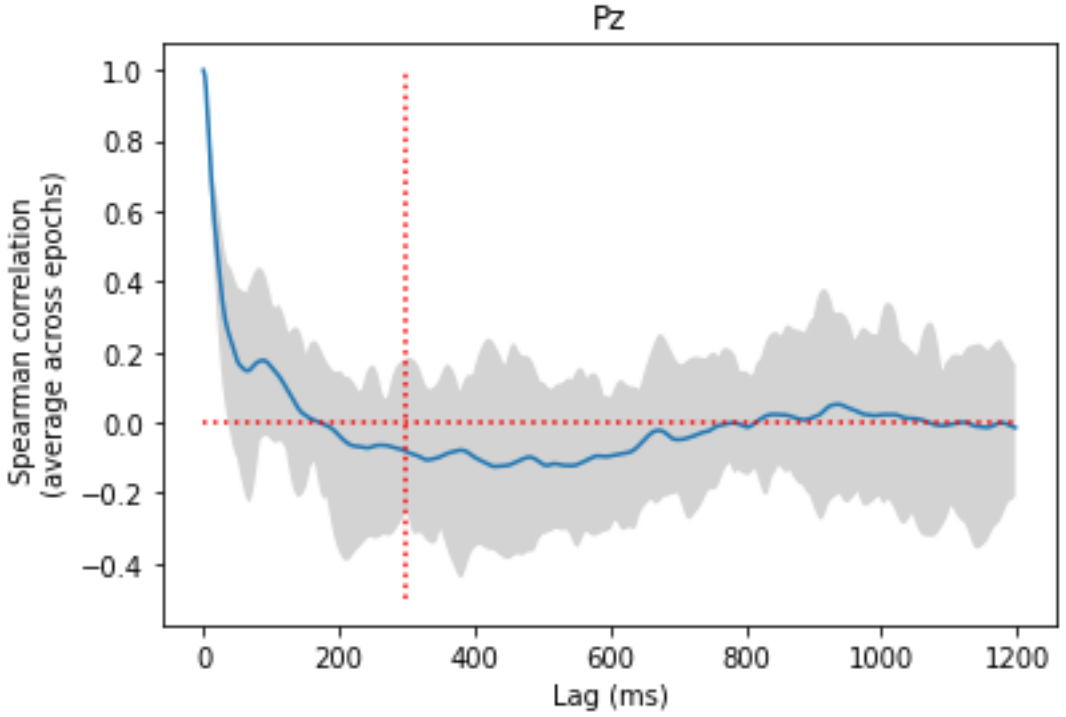

T4
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800
1000
1200
Lag (ms)


T5
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


T6
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


Fz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


Cz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)


Pz
Spearman correlation
(average across epochs)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
1000
1200
Lag (ms)