

# Kalman Filter Analysis for Experiment 06 and Condition Vestibular

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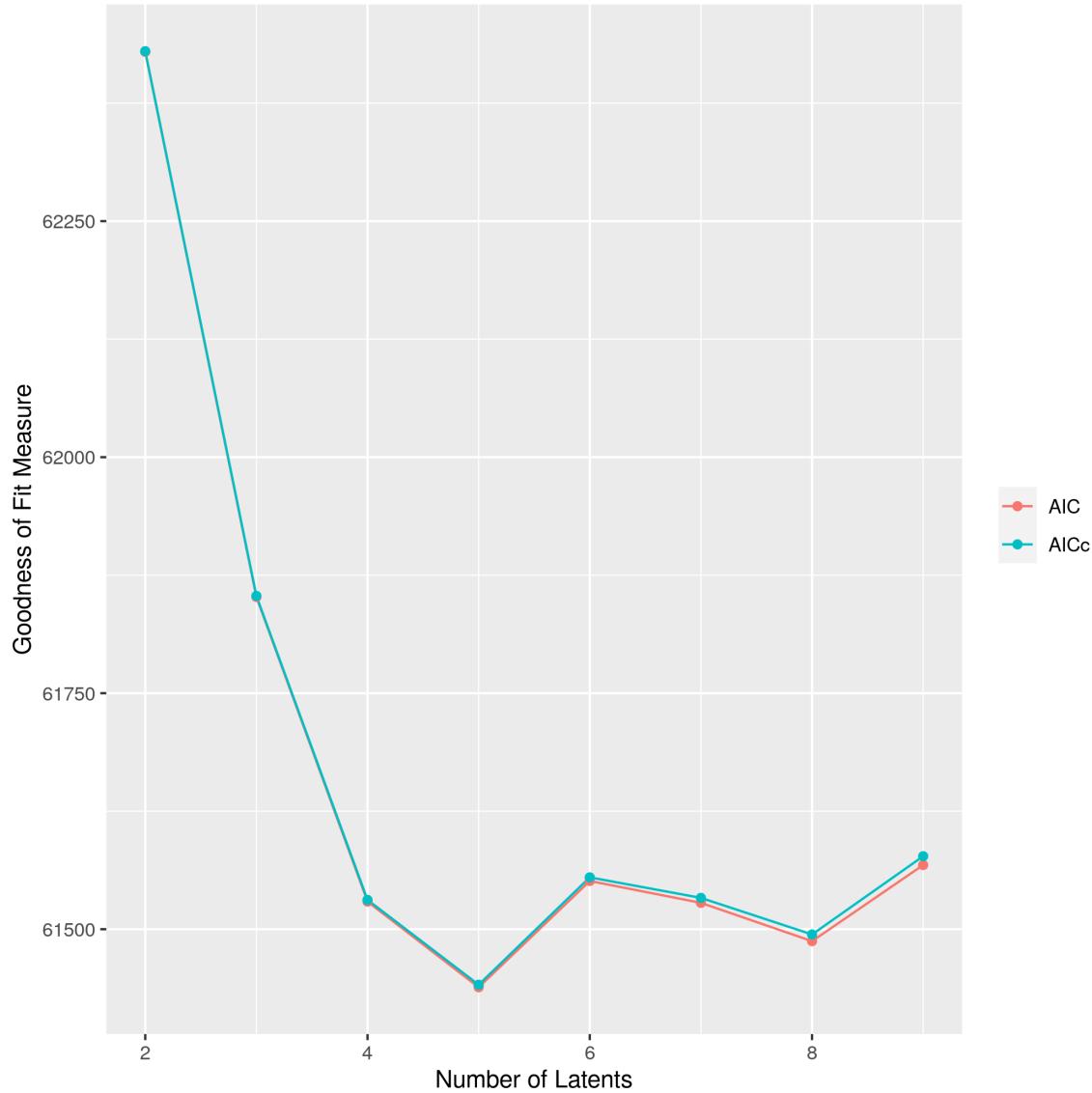


Figure 1: AIC curves used to select the number of latents. Click on the figure to open the interactive version.

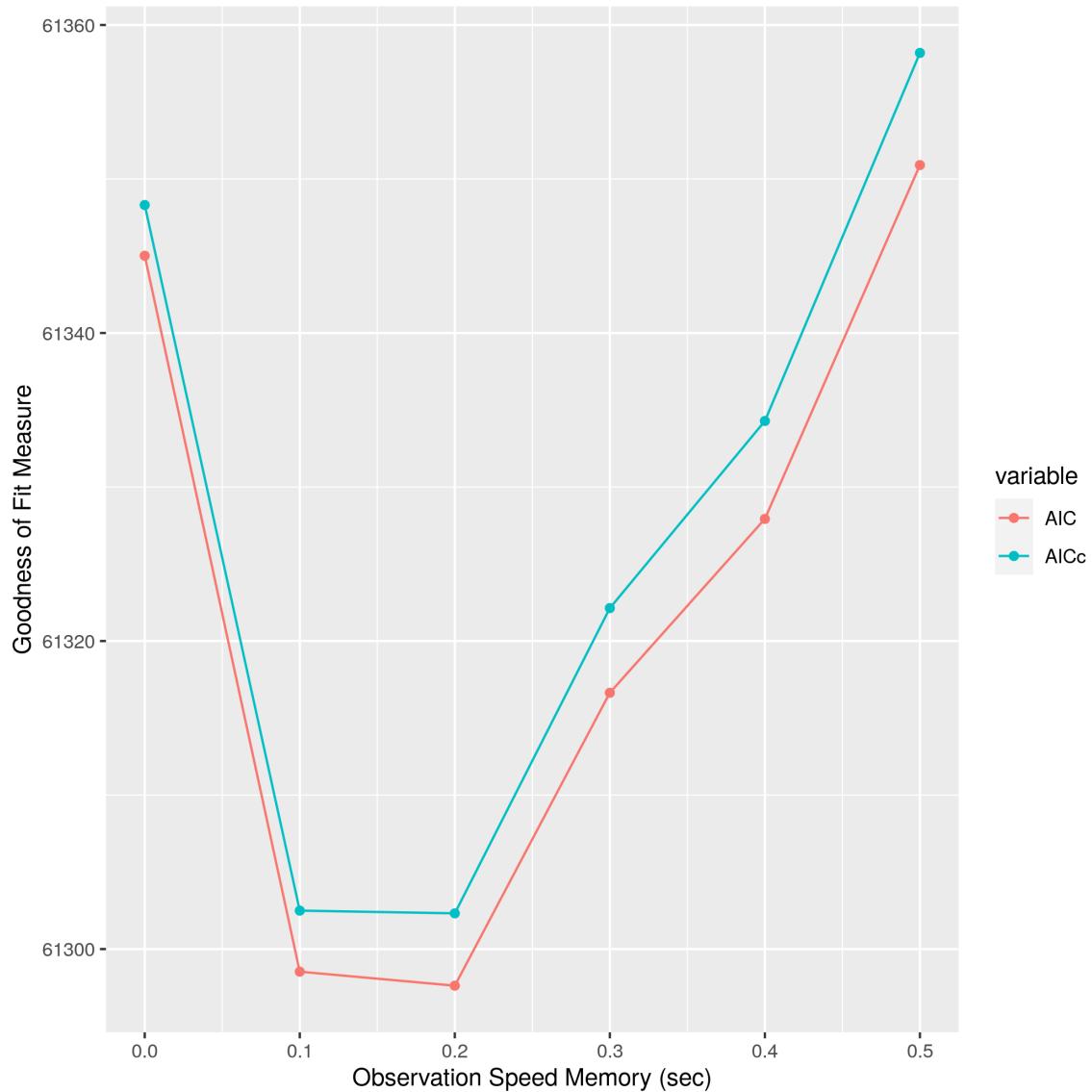


Figure 2: AIC curves used to select the length of the observations speed memory. Click on the figure to open the interactive version.

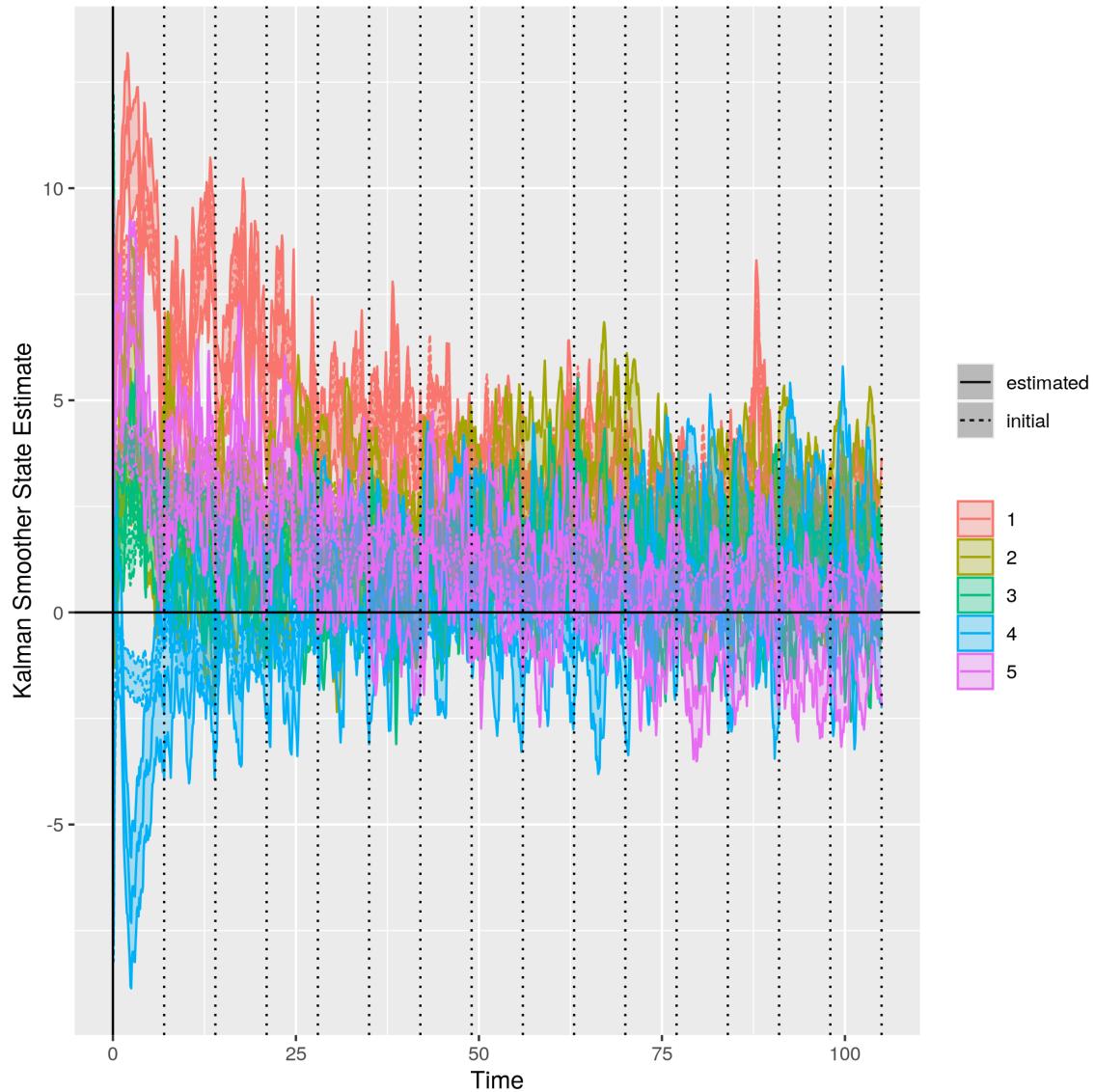


Figure 3: Estimated latents using the Kalman smoother (i.e.,  $P(x_n|y_1, \dots, y_N)$ ). Click on the figure to open the interactive version.

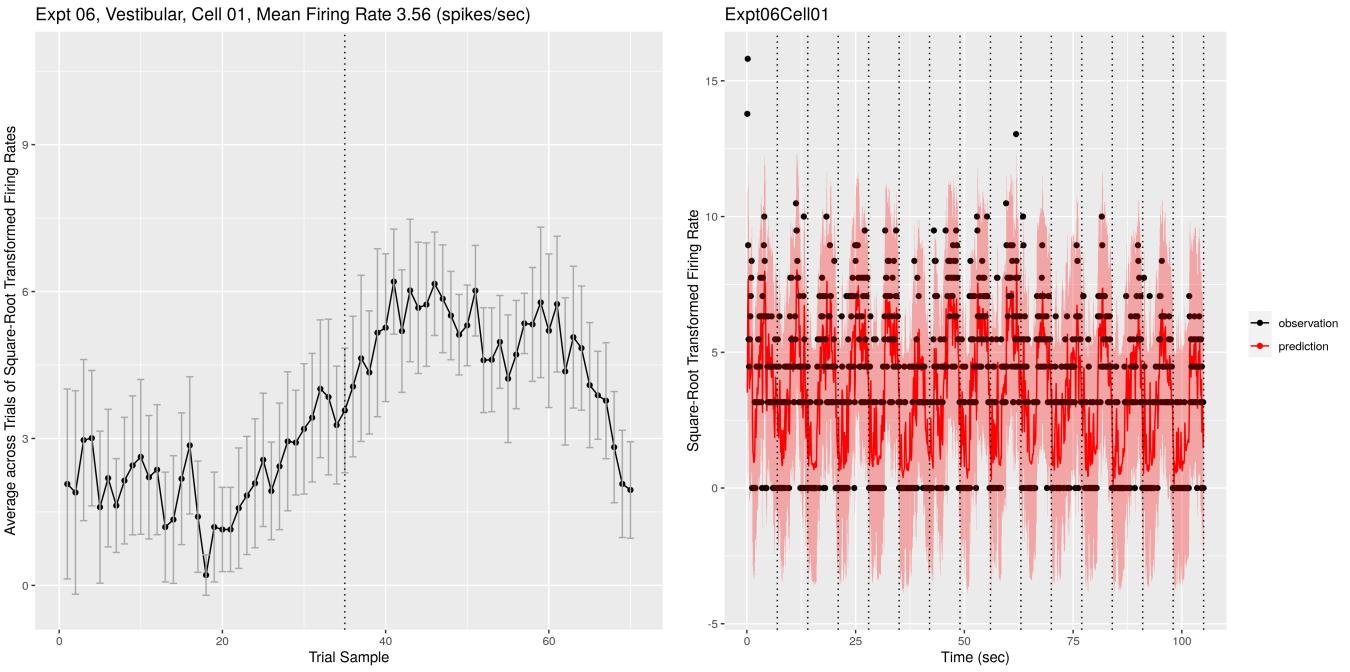


Figure 4: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 01 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

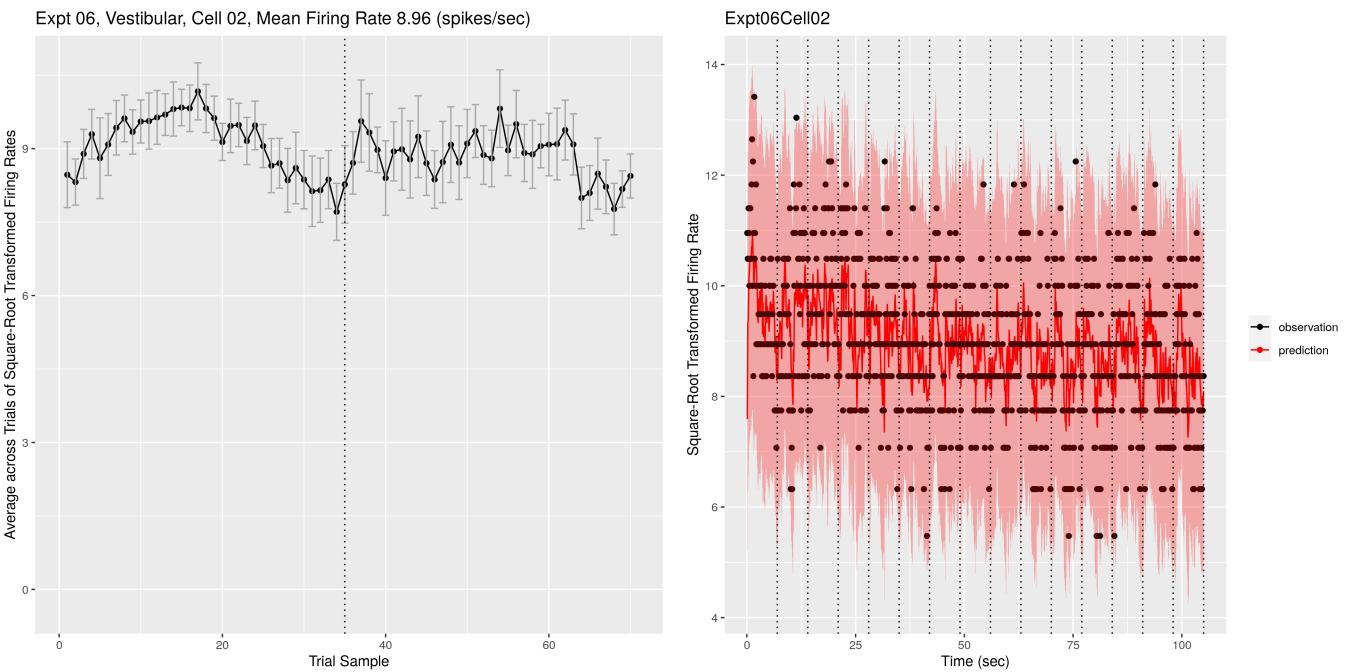


Figure 5: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 02 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

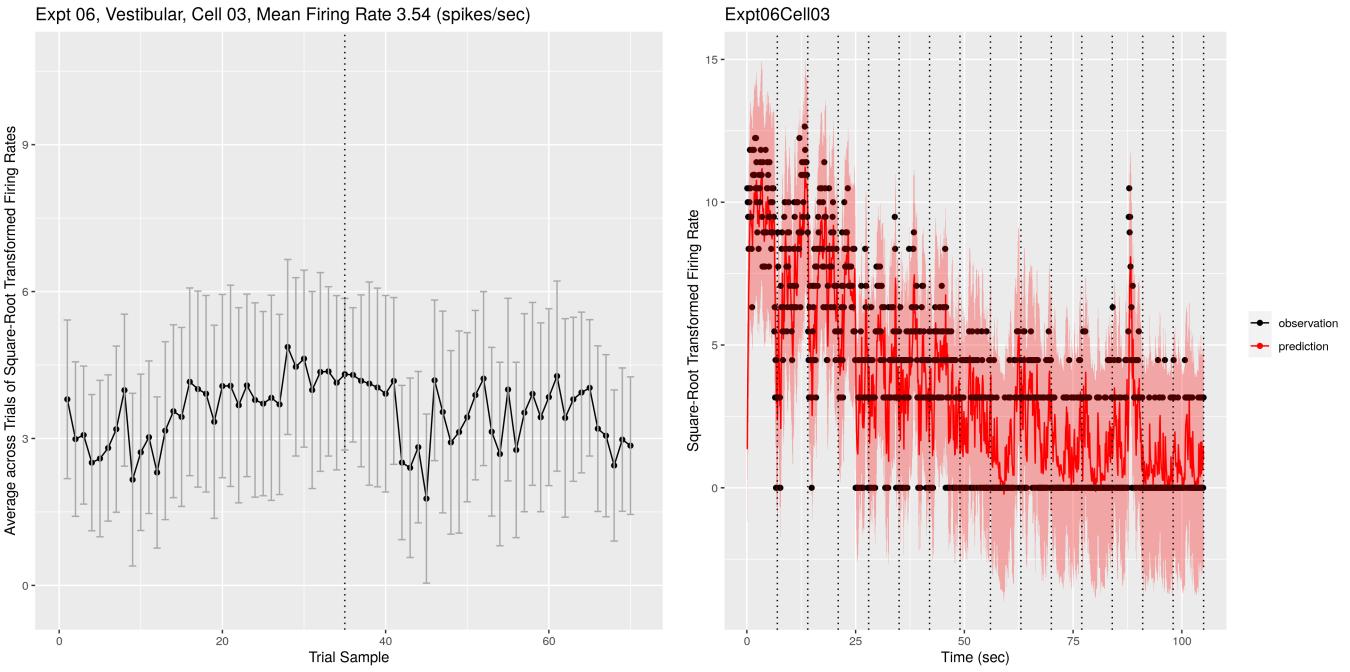


Figure 6: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 03 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

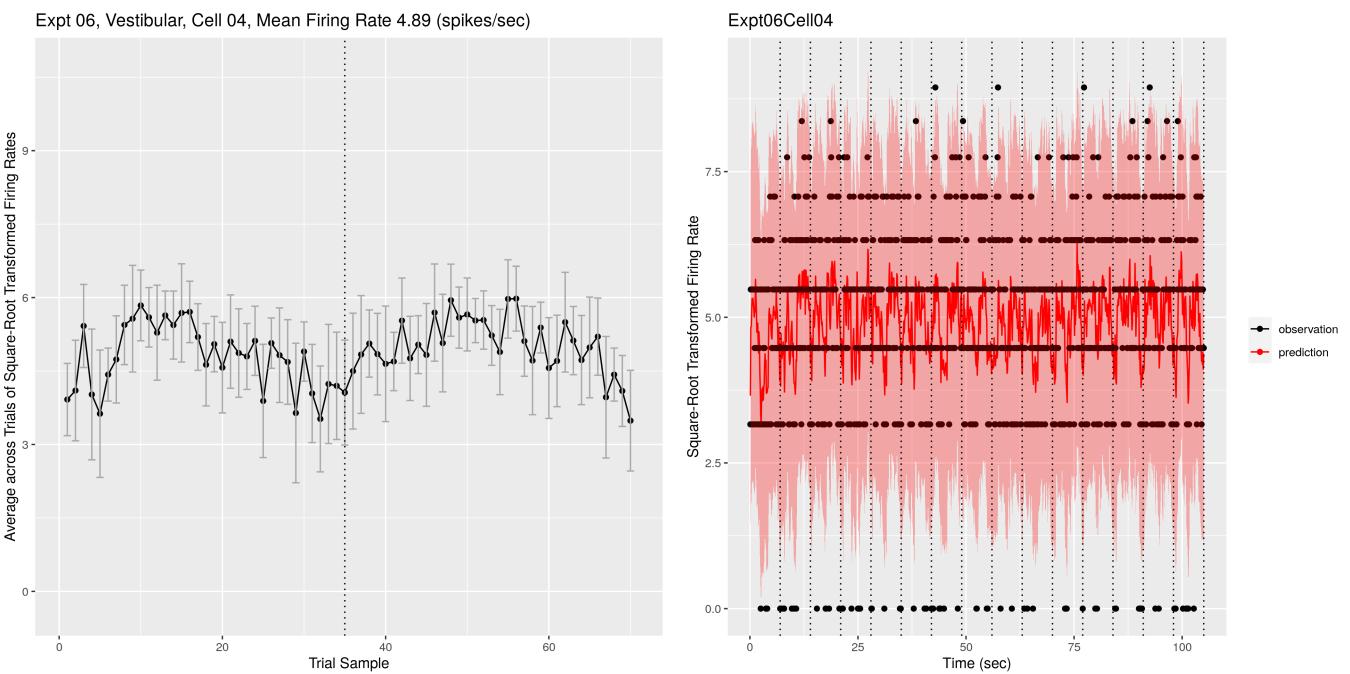


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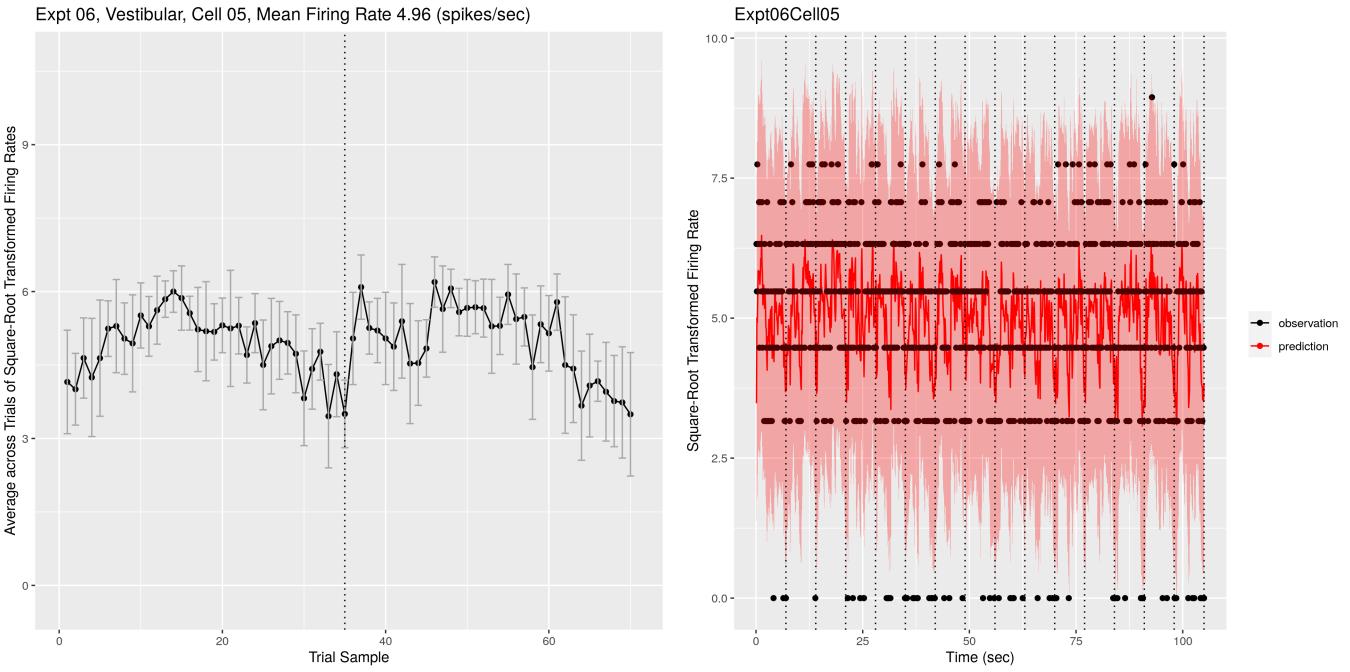


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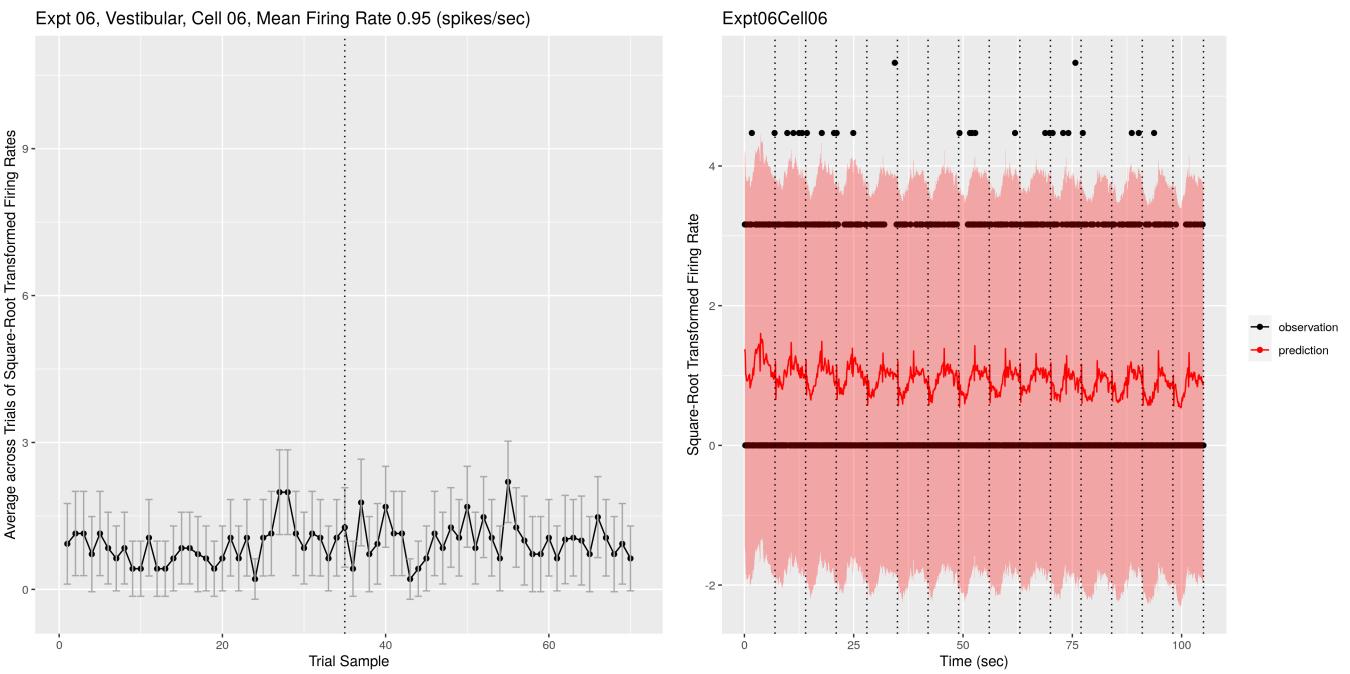


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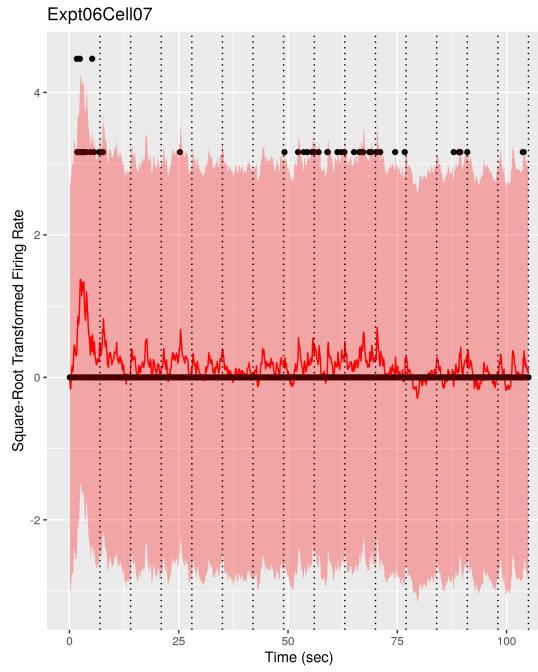
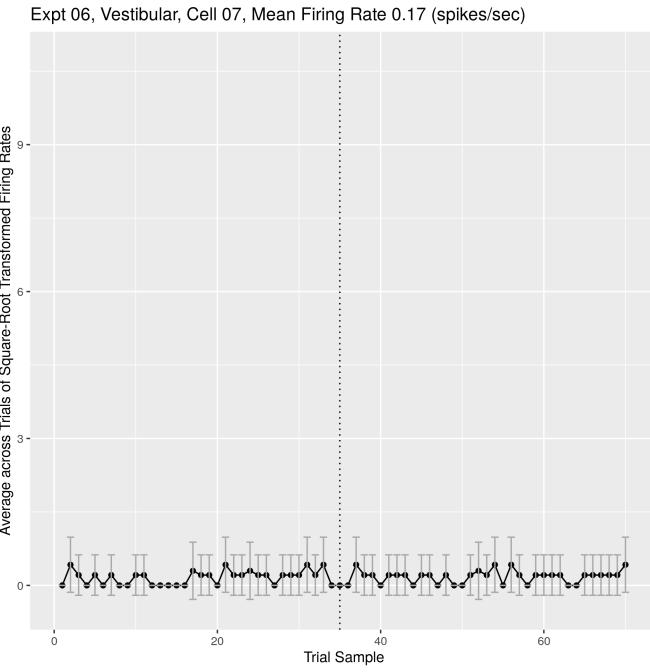


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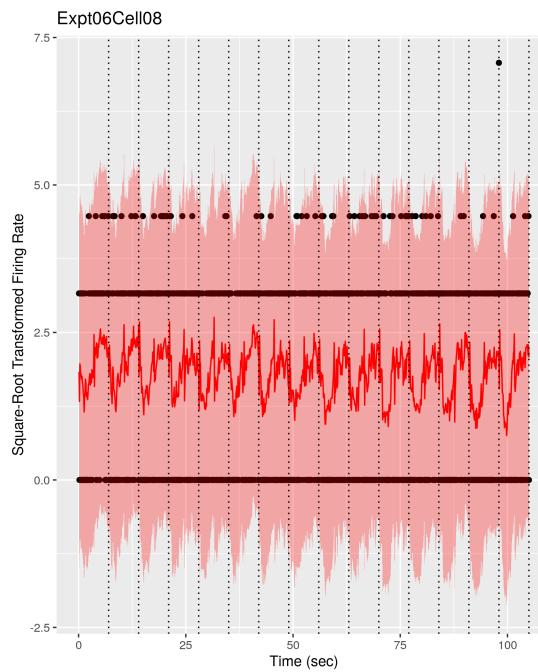
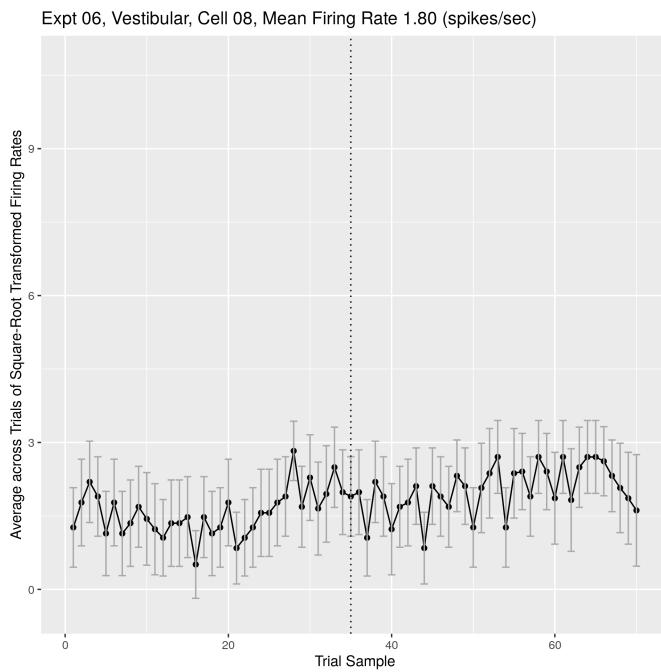


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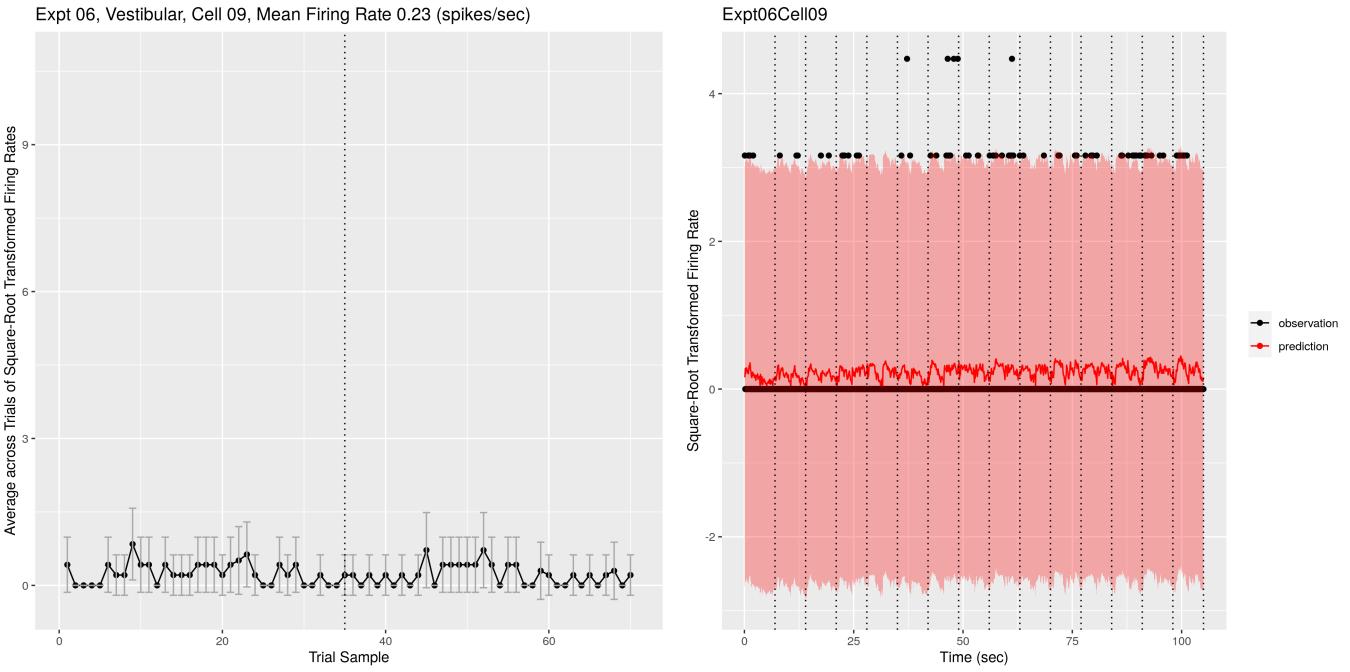


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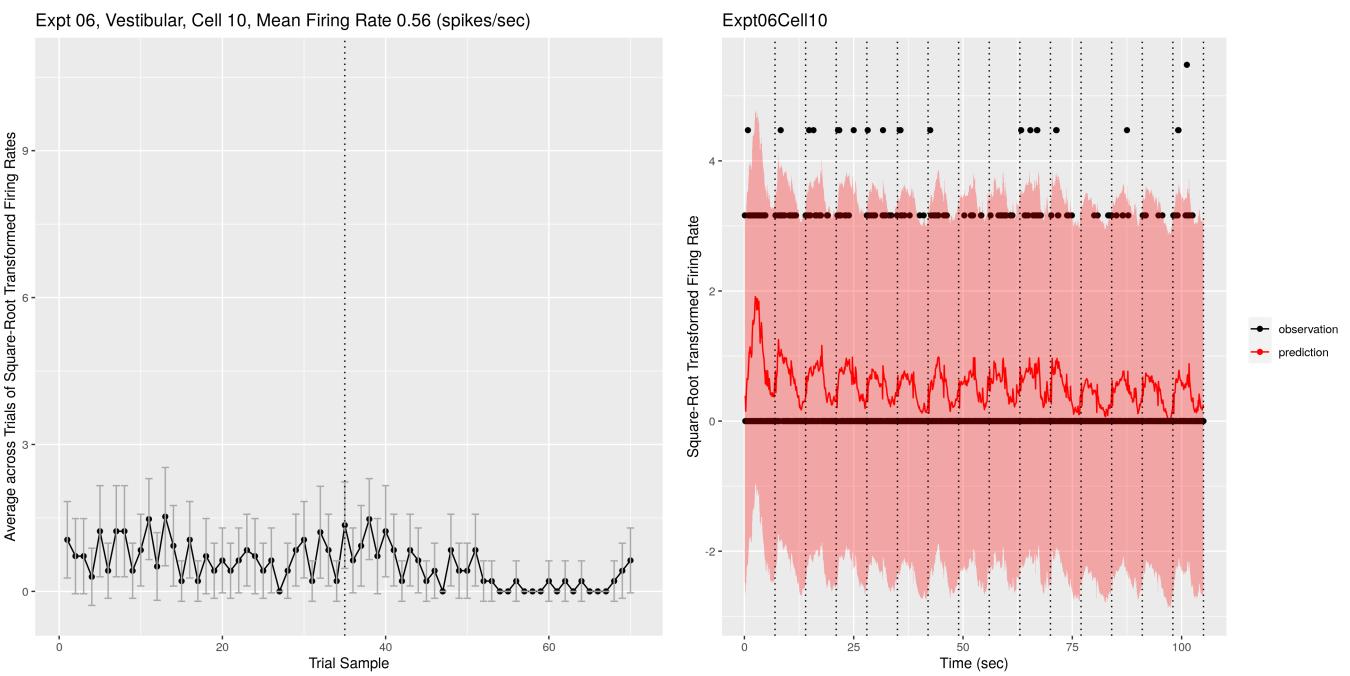


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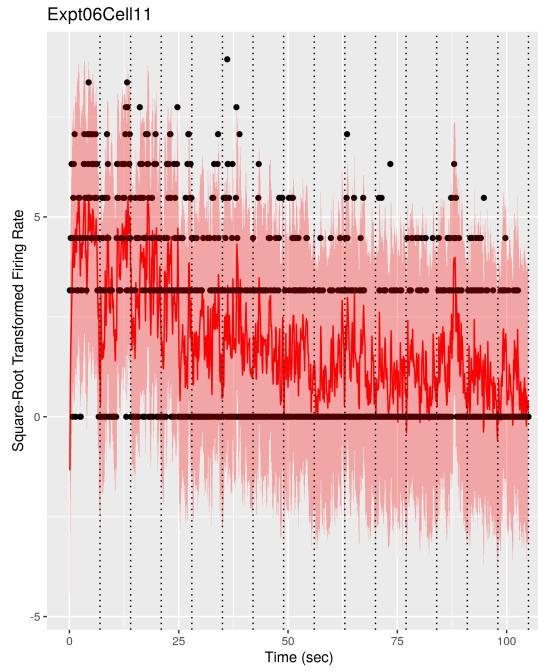
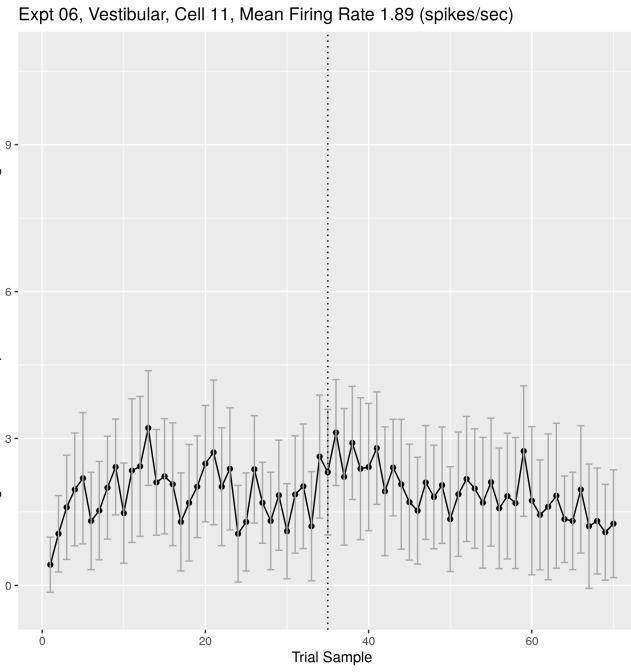


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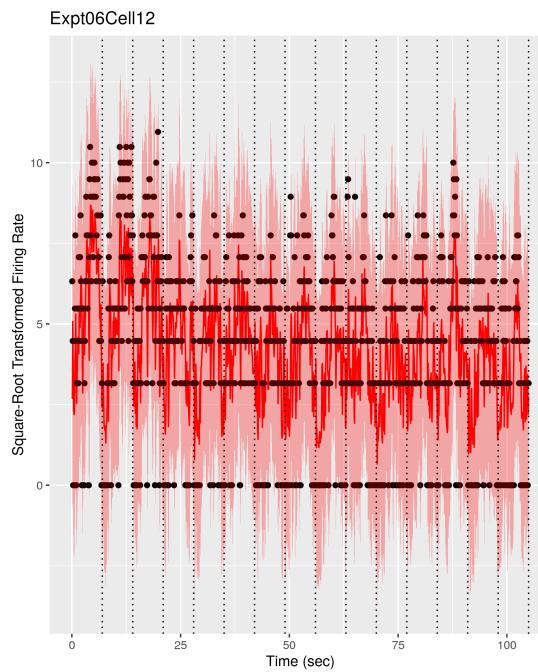
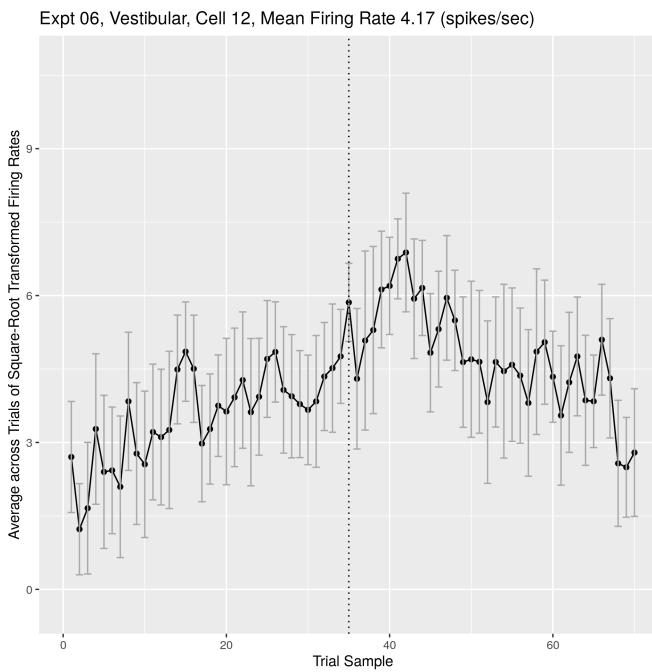


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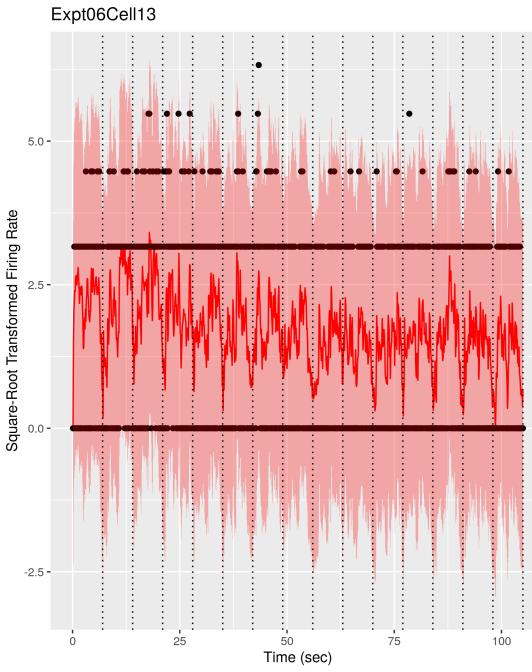
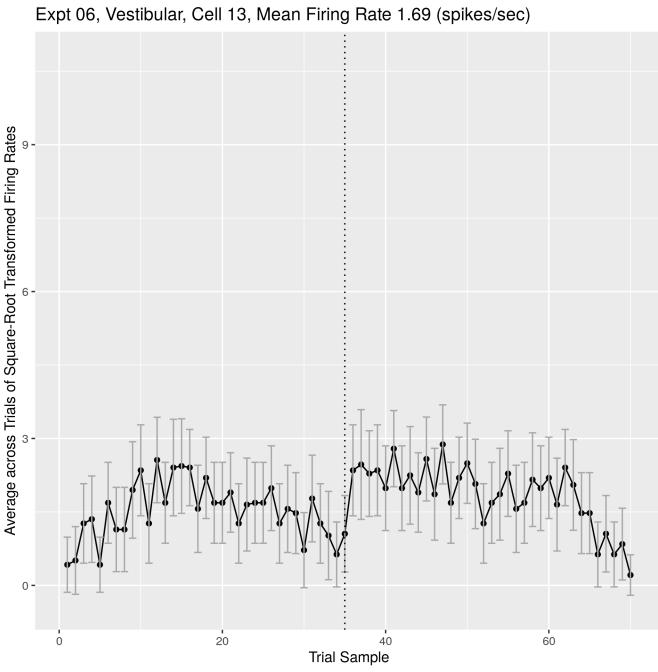


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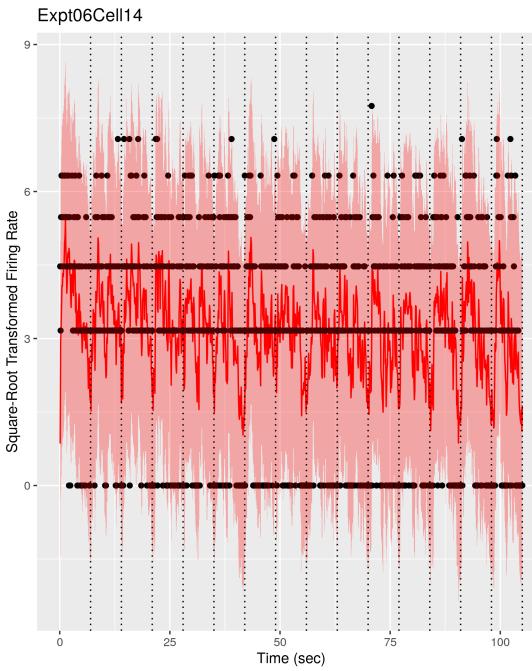
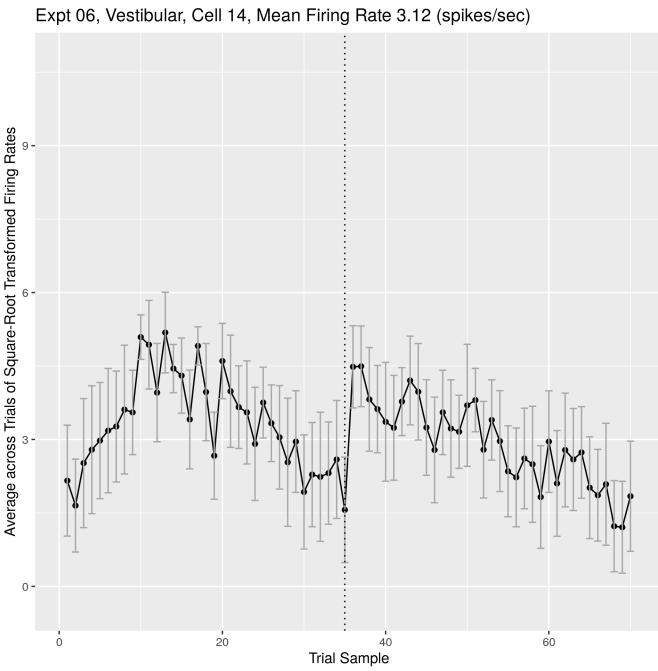


Figure 17: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 14 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

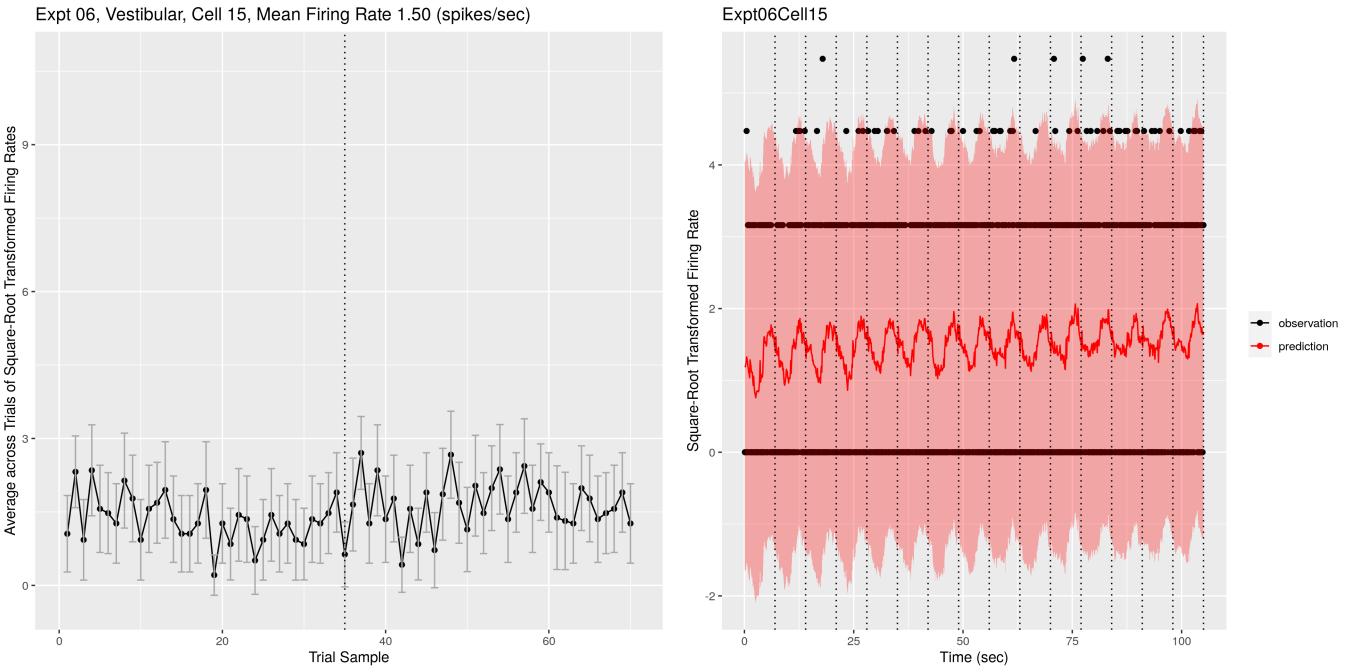


Figure 18: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 15 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

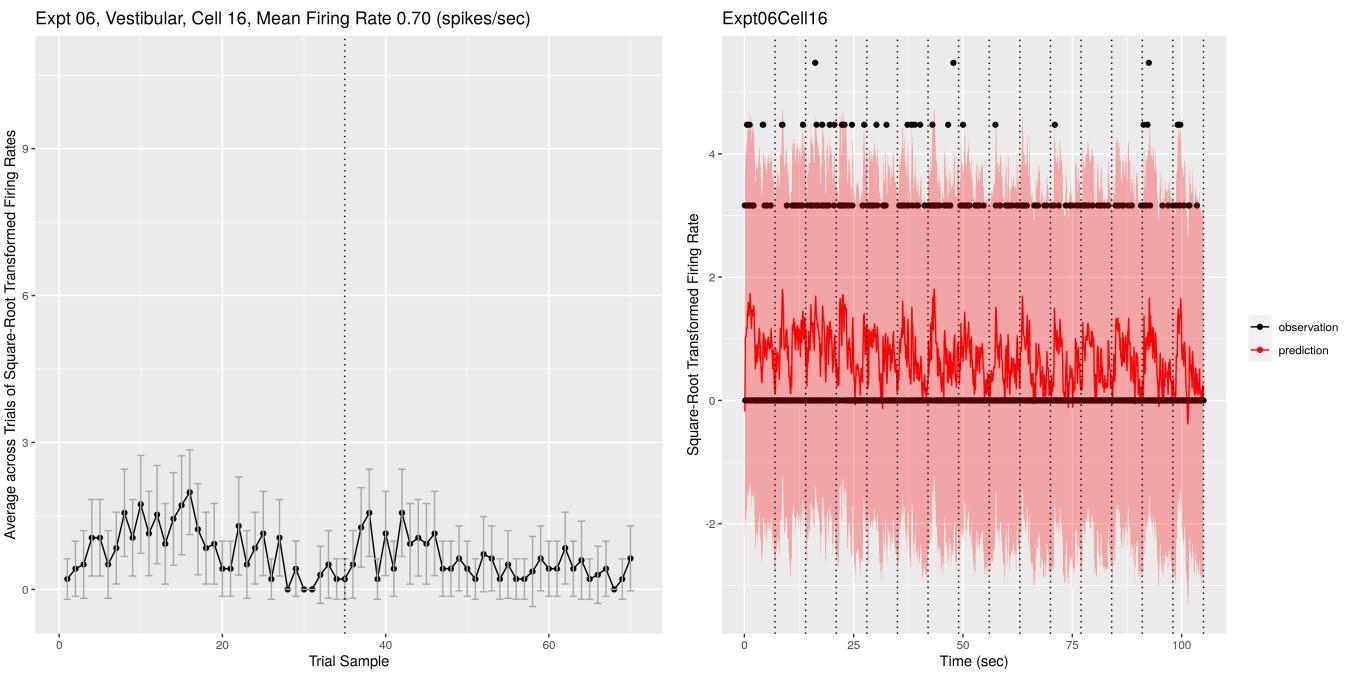


Figure 19: Left: trial-averaged squared-root transformed firing rates. Right: one-step-ahead prediction of cell 16 response (i.e.,  $P(y_n|y_1, \dots, y_{n-1}, s_n, \dots, s_{n-L})$ ). Click on the figures to open the interactive version.

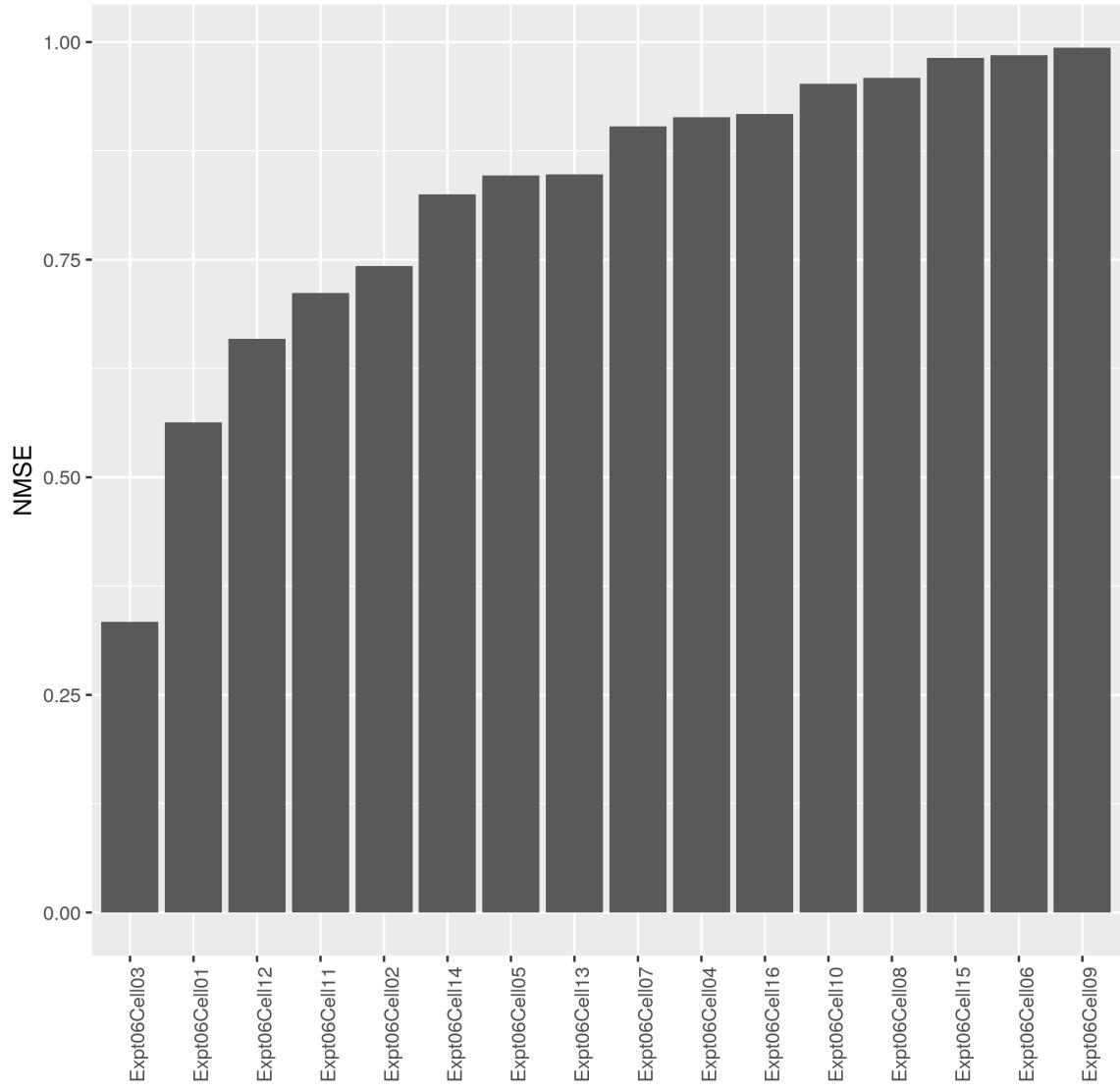


Figure 20: Normalized MSE of predictions. Click on the figure to open the interactive version.

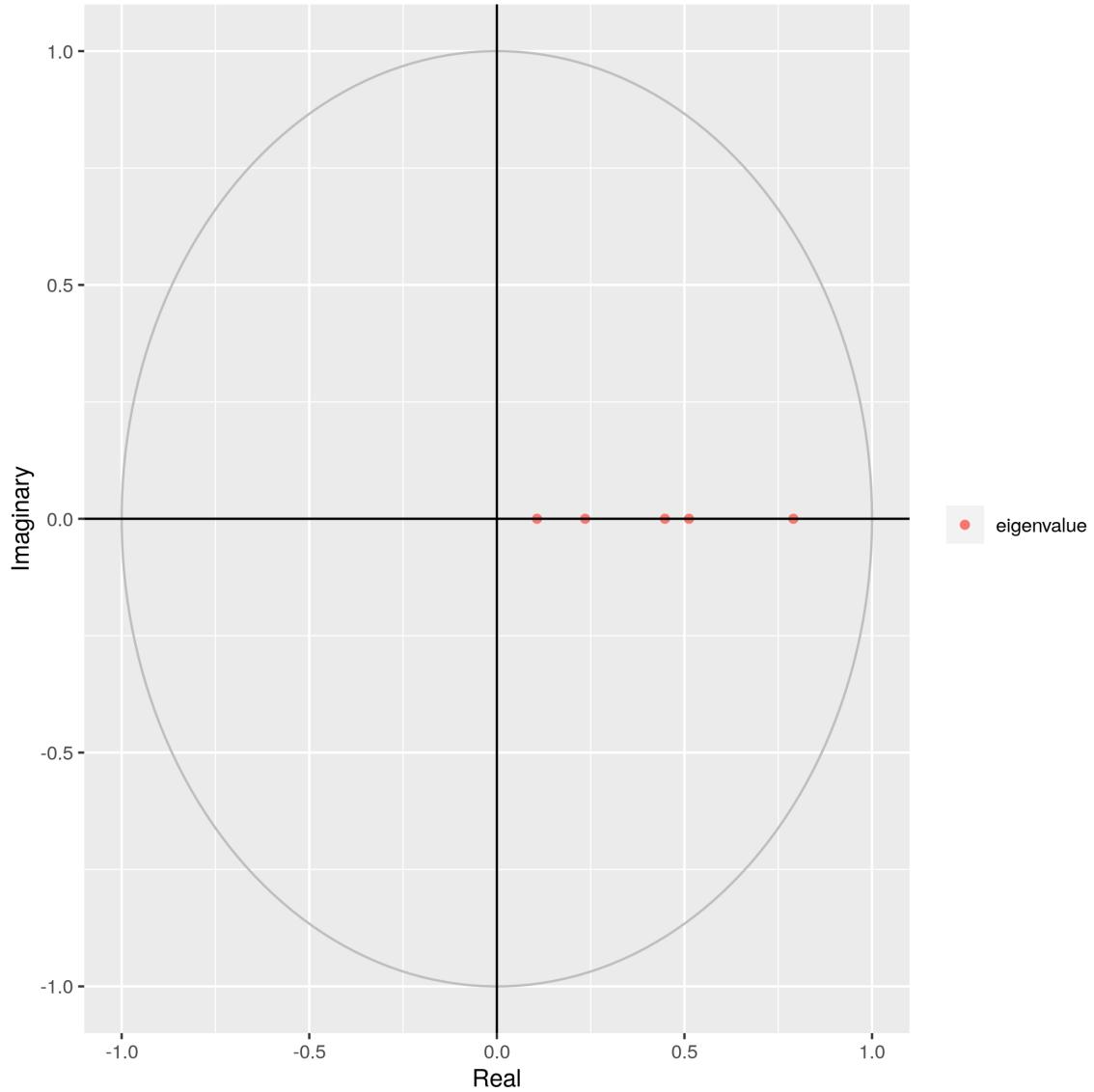


Figure 21: Eigenvalues of the state transition matrix  $B$ . Click on the figure to open the interactive version.

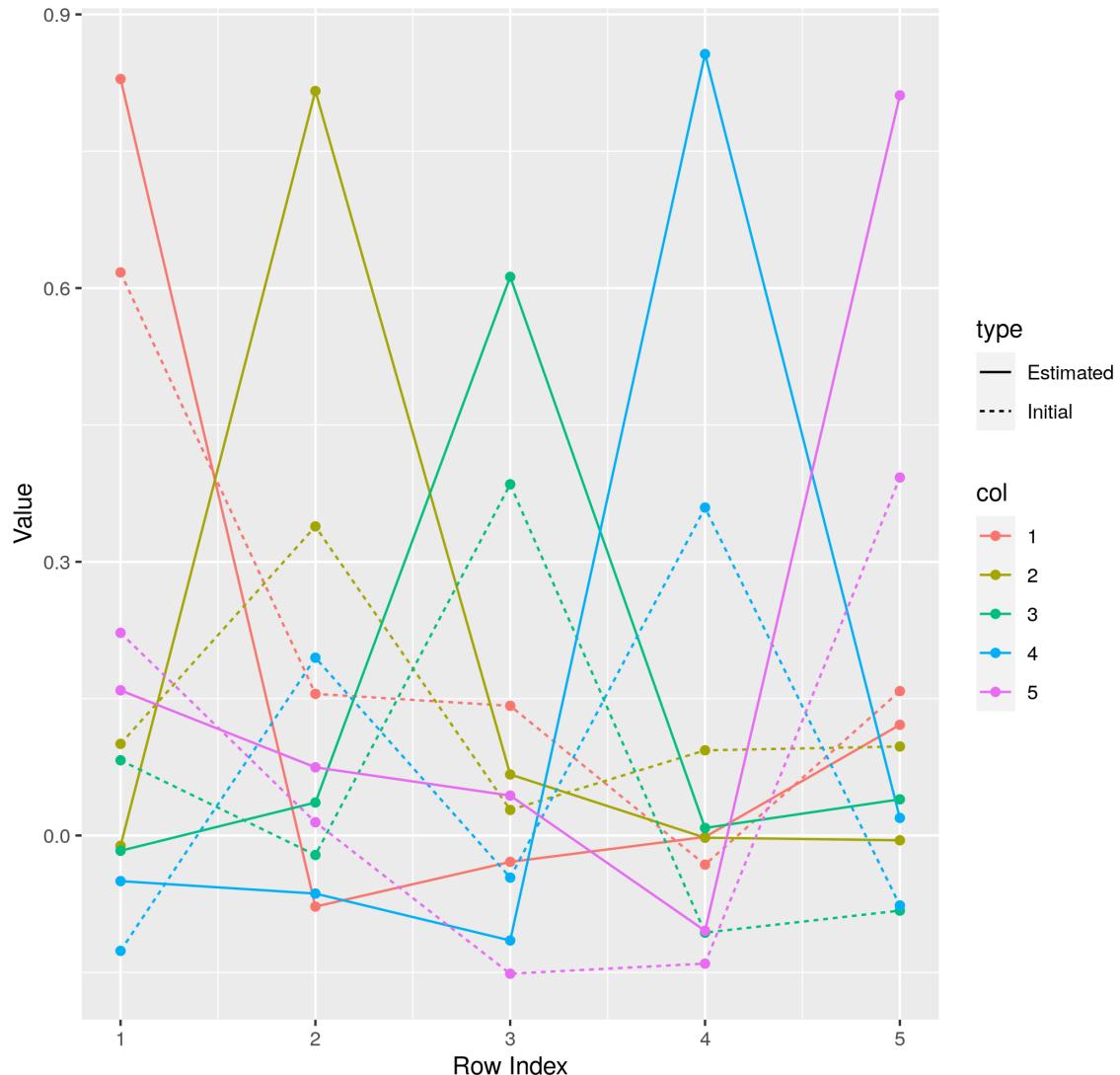


Figure 22: Columns of the state transition matrix B. Click on the figure to open the interactive version.

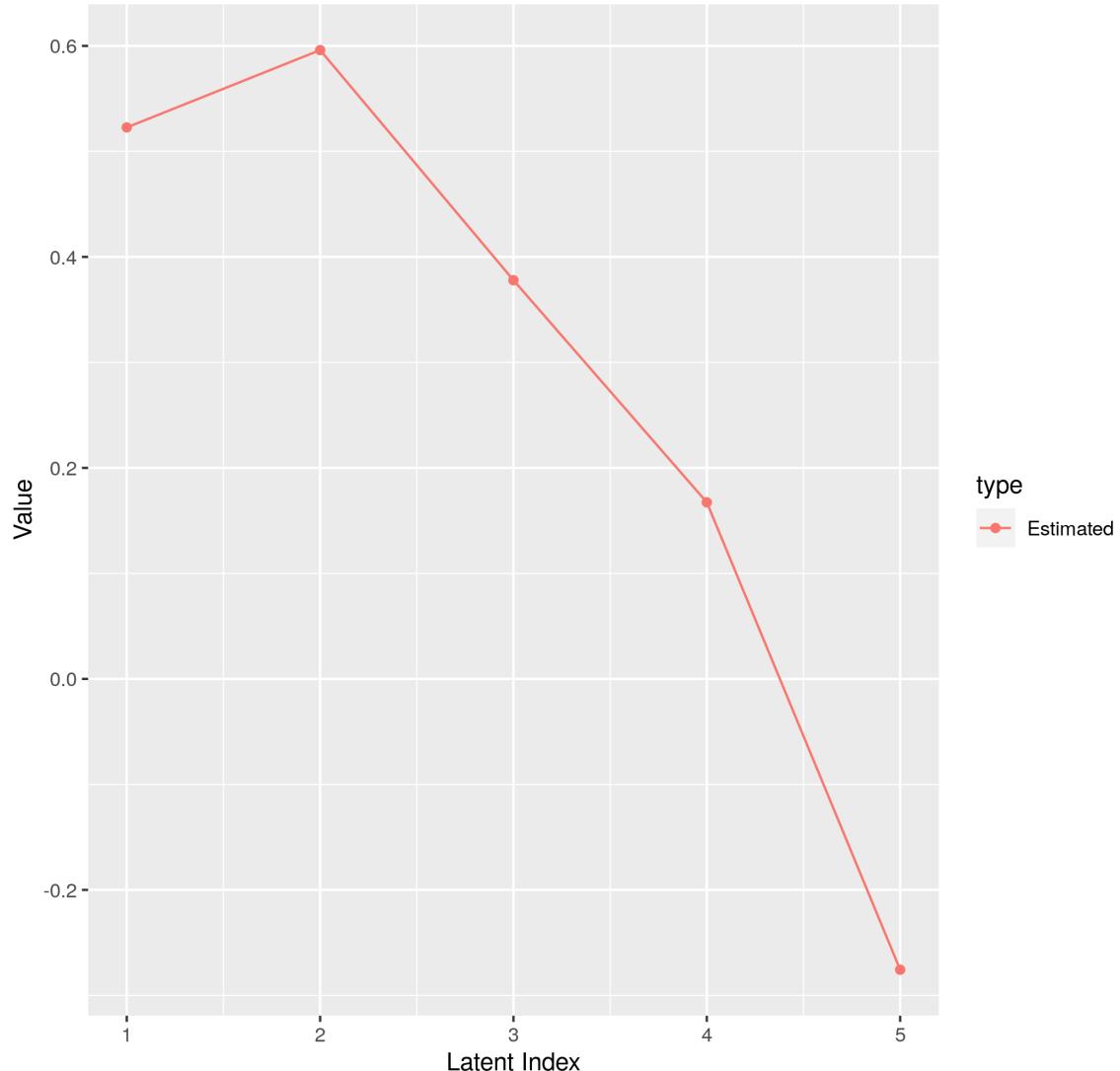


Figure 23: State drift vector  $u$ . Click on the figure to open the interactive version.

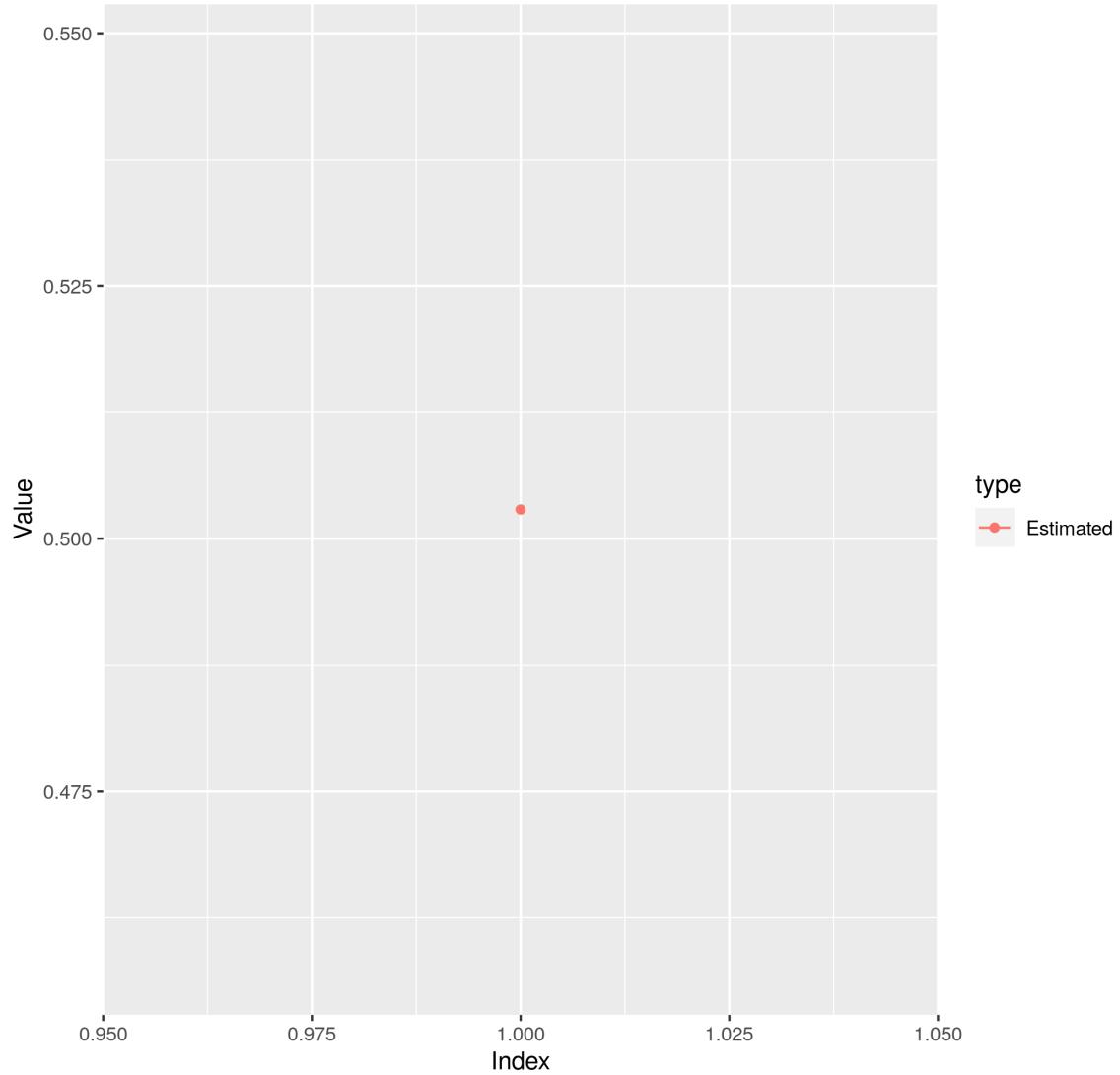


Figure 24: State noise variance. Click on the figure to open the interactive version.

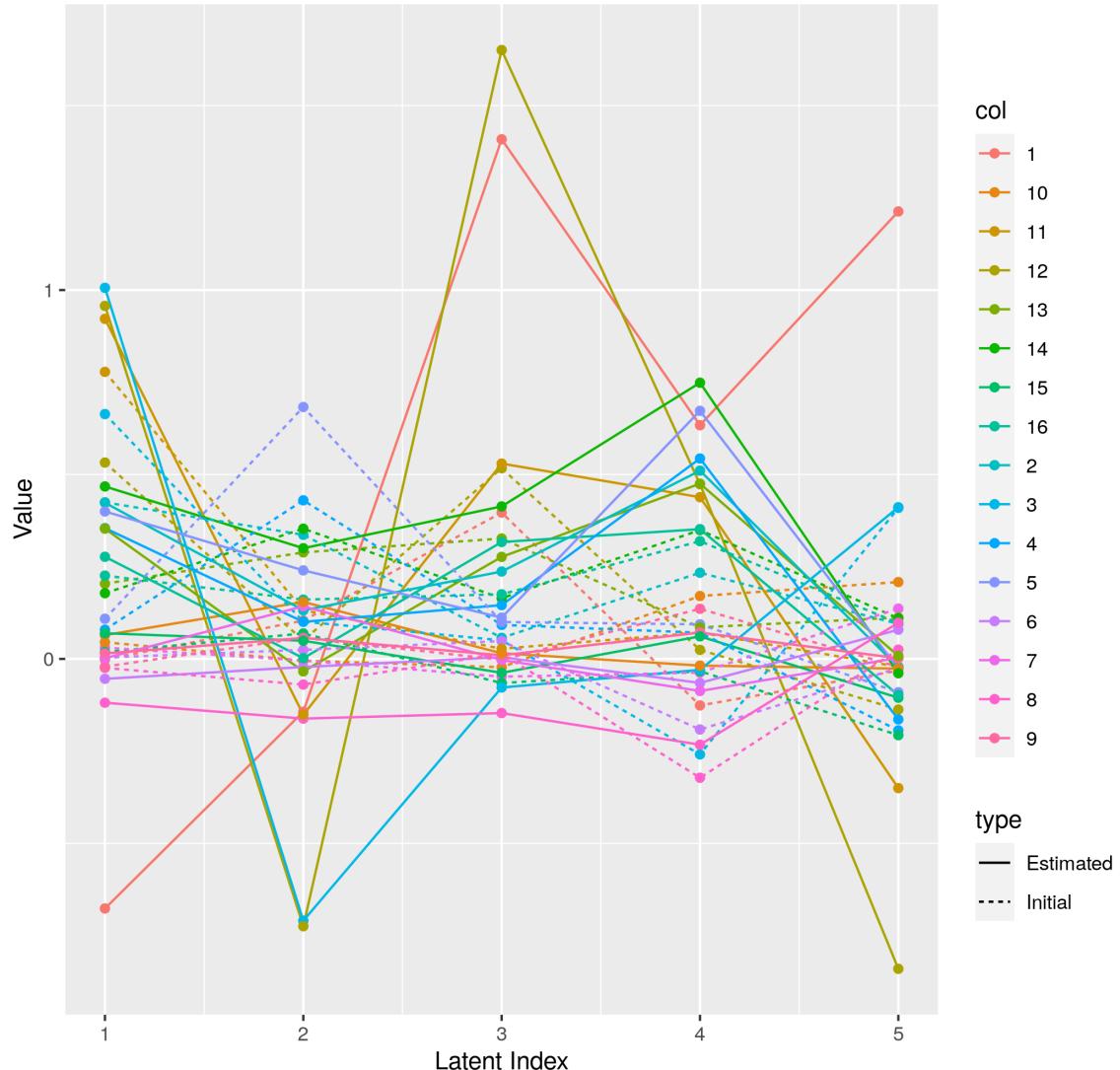


Figure 25: Columns of the observation matrix  $Z$ . Click on the figure to open the interactive version.

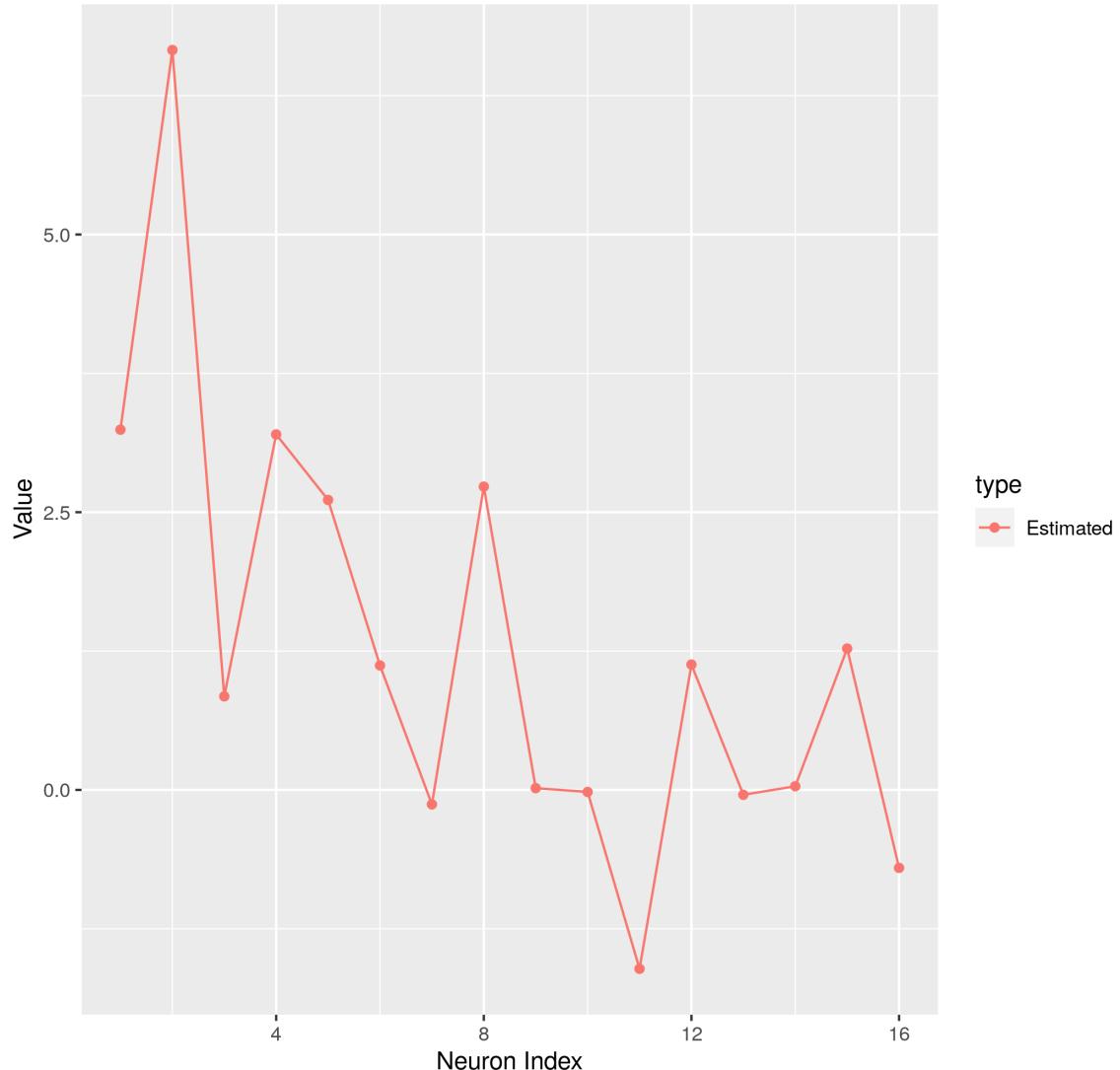


Figure 26: Observation constant term a. Click on the figure to open the interactive version.

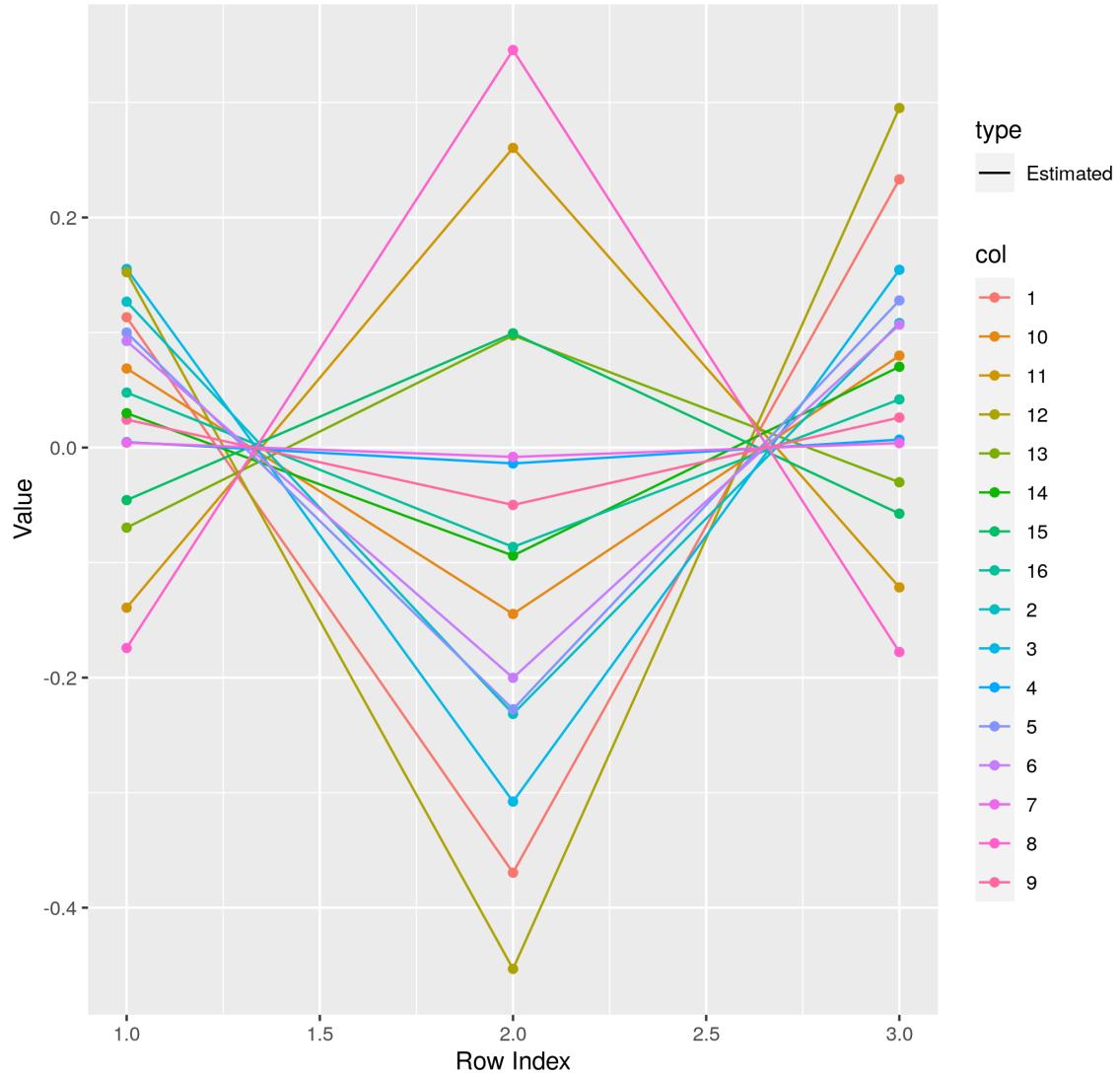


Figure 27: Rows of the observation input matrix  $D$ . Click on the figure to open the interactive version.

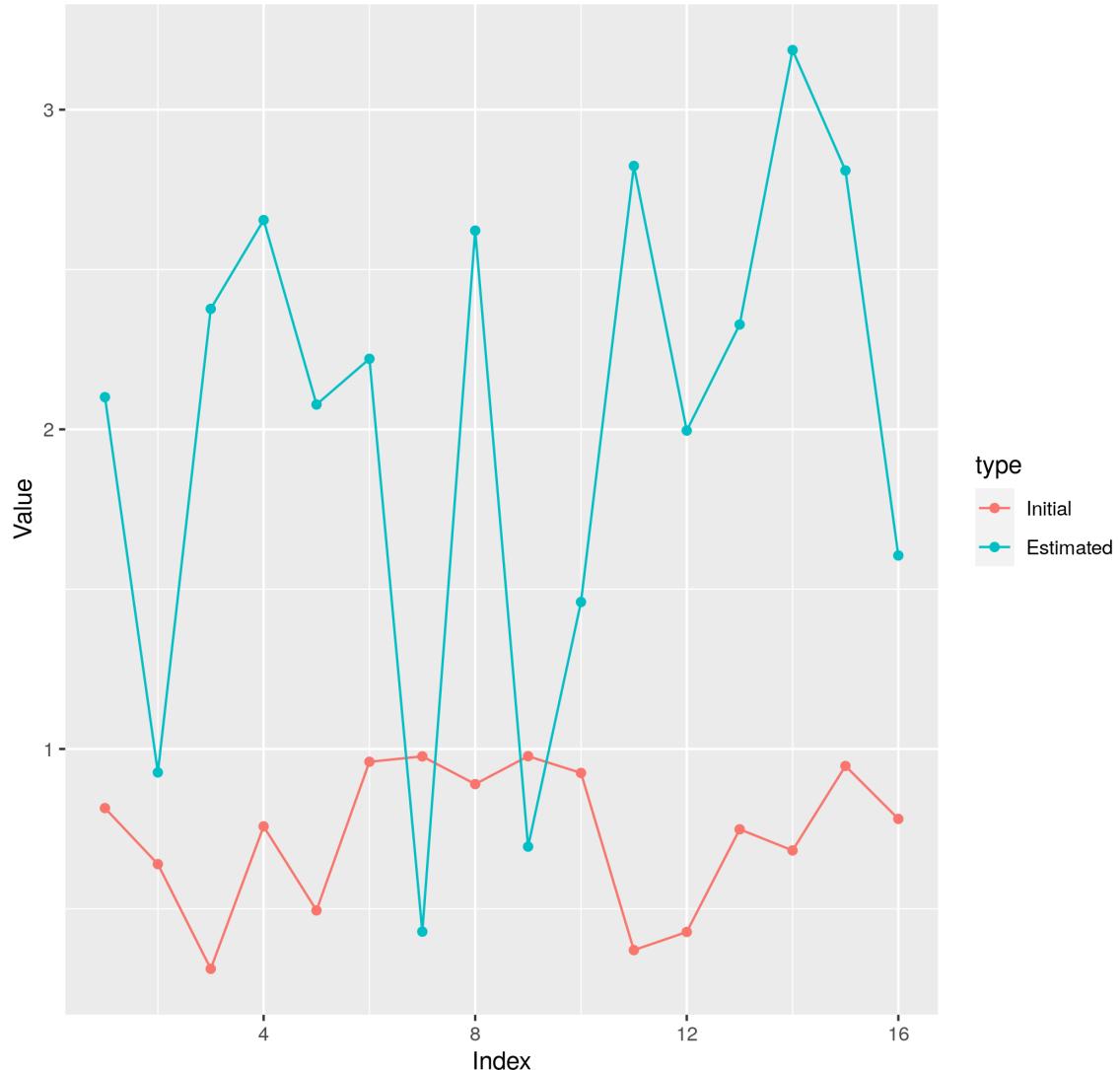


Figure 28: Diagonal of the diagonal observations covariance matrix.