Updated plots by filtering the sessions

After filtering the sessions with:

Number of neurons > 200

Number of trials > 40 per direction
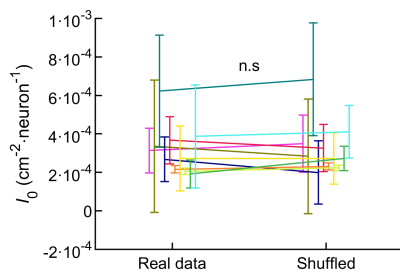
Mean decoding error < 6cm

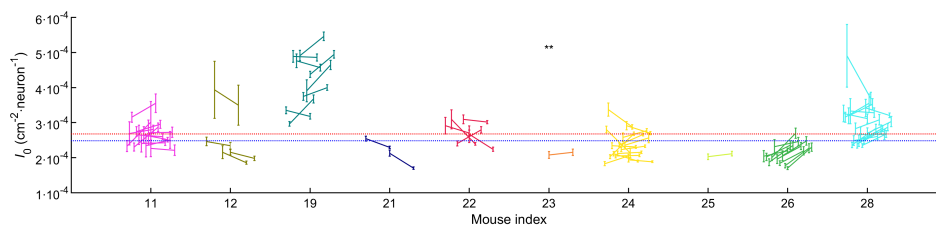These are all the plots that are updated by this change.

Figure 2

g - Effect on I_0

```
figure;
org.bns('I0', 'I0_s', true, false);
Utils.fix_exponent(gca,'y',0);
ylabel '{\itI}_0 (cm^{-2}\cdotneuron^{-1})'
figure_format([4 3]/2.5);
```



```
figure;
org.bns('I0', 'I0_s', false, false);
Utils.fix_exponent(gca,'y',0);
ylabel '{\itI}_0 (cm^{-2}\cdotneuron^{-1})'
xlabel 'Mouse index'
Utils.specific_format('MBNS');
```
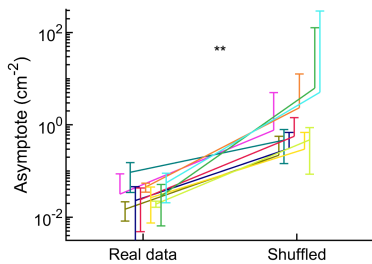
h - Effect on $I_0 N$

```
figure;
org.bns('I0N', 'I0N_s', true, true);
```

```
ylabel 'Asymptote (cm^{-2})'
ylim(10.^[-2.5 2.5]);
figure_format([4 3]/2.5);
```
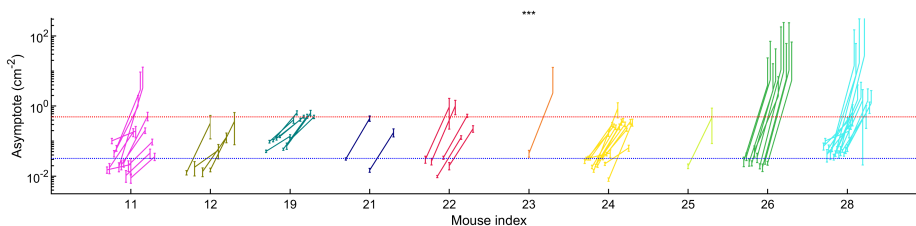


```
figure;
org.bns('I0N', 'I0N_s', false, true);
```

```
ylabel 'Asymptote (cm^{-2})'
ylim(10.^[-2.5 2.5]);
xlabel 'Mouse index'
Utils.specific_format('MBNS');
```


Effect on N

```
figure;
org.bns('N50', 'N50_s', true, true);
```

```
ylabel '{\itN} (neurons)'
```

2

```
%ylim(10.^[-2.5 2.5]);
figure_format([4 3]/2.5);
```



```
figure;
org.bns('N50', 'N50_s', false, true);
```

```
 Warning: Negative data ignored
```

```
ylabel '{\itN} (neurons)'
%ylim(10.^[-2.5 2.5]);
xlabel 'Mouse index'
Utils.specific_format('MBNS');
```
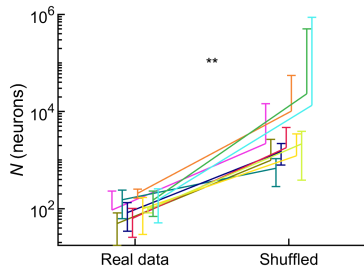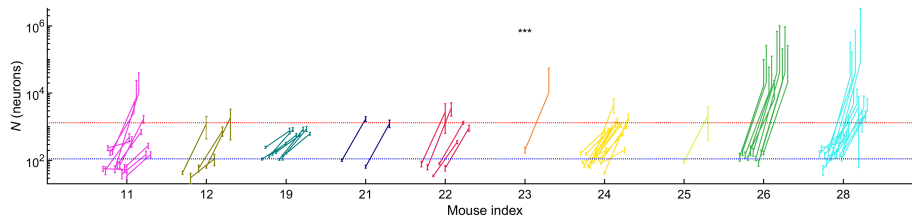


```
 Warning: Negative data ignored
 Warning: Negative data ignored
```
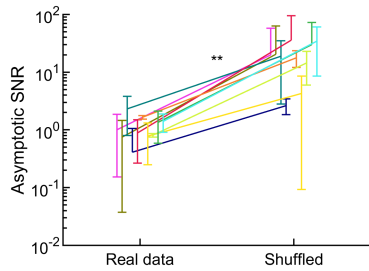
Figure 3

f - Effect on asymptotic SNR

```
figure;
org.bns('asymp_snr', 'asymp_snr_shuf', true, true);
```

```
 Warning: Negative data ignored
```
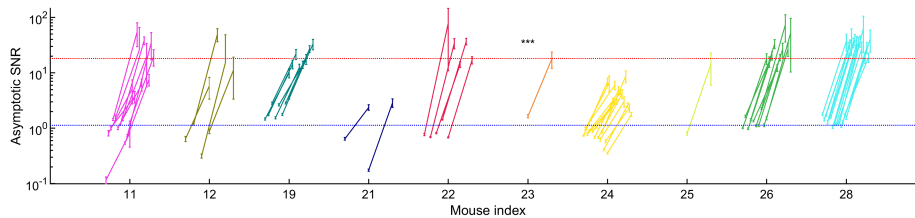
```
ylabel 'Asymptotic SNR'
figure_format([4 3]/2.5);
```

```
figure;
org.bns('asymp_snr', 'asymp_snr_shuf', false, true);
```

 Warning: Negative data ignored

```
ylabel 'Asymptotic SNR'
xlabel 'Mouse index'
Utils.specific_format('MBNS');
```


 Warning: Negative data ignored
 Warning: Negative data ignored

g - I_0 correspondence

```
figure;
org.correlogram('single_dp2', 'I0', true);
```
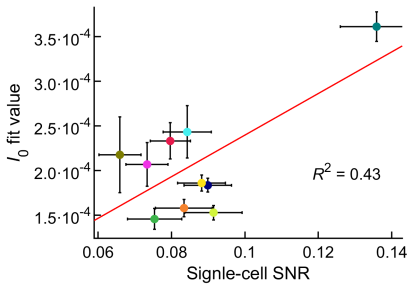
```
 Using only 71 out of 107 sessions
 Mouse-aggregated correlations single_dp2 vs. I0: adj. R^2 = 0.428
 Pearson: 0.701, p = 2.393665e-02, *
 Spearman: 0.067, p = 8.647535e-01, n.s
 Kendall: 0.022, p = 1.000000e+00, n.s
```

```
xlabel 'Signle-cell SNR'
ylabel '{\itI}_0 fit value'
Utils.fix_exponent(gca, 'y', 1);
figure_format([4 3]/2.5);
```

```
figure;
org.correlogram('single_dp2', 'I0', false);
```

```
Using only 71 out of 107 sessions
Sessionwise correlations single_dp2 vs. I0: adj. R^2 = 0.426
Pearson: 0.659, p = 4.230067e-10, ***
Spearman: 0.480, p = 2.236031e-05, ***
Kendall: 0.331, p = 4.597673e-05, ***
```

```
xlabel 'Signle-cell SNR'
ylabel '{\itI}_0 fit value'
Utils.fix_exponent(gca, 'y', 0);
figure_format([4 3]/2.5);
```
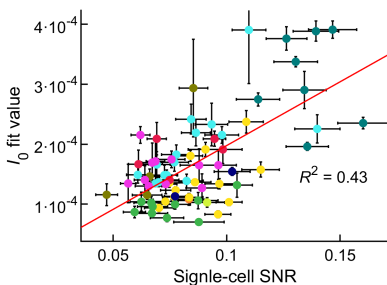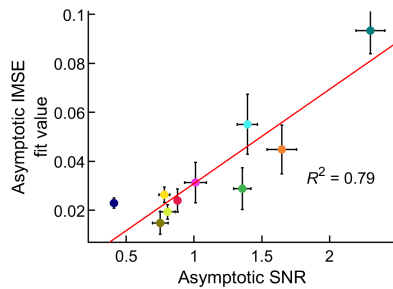

h - Asymptotic correspondence

```
figure;
org.correlogram('asymp_snr', 'I0N', true);
```

```
Using only 71 out of 107 sessions
Mouse-aggregated correlations asymp_snr vs. I0N: adj. R^2 = 0.794
Pearson: 0.904, p = 3.323948e-04, ***
Spearman: 0.891, p = 1.380267e-03, **
Kendall: 0.733, p = 2.212853e-03, **
```

```
xlabel 'Asymptotic SNR'
ylabel(sprintf('Asymptotic IMSE\nfit value'));
figure_format([4 3]/2.5);
```

```
figure;
org.correlogram('asymp_snr', 'I0N', false);
```

```
Using only 71 out of 107 sessions
Sessionwise correlations asymp_snr vs. I0N: adj. R^2 = 0.453
Pearson: 0.679, p = 7.857710e-11, ***
Spearman: 0.650, p = 8.453635e-10, ***
Kendall: 0.469, p = 7.797761e-09, ***
```

```
xlabel 'Asymptotic SNR'
ylabel(sprintf('Asymptotic IMSE\nfit value'));
figure_format([4 3]/2.5);
```
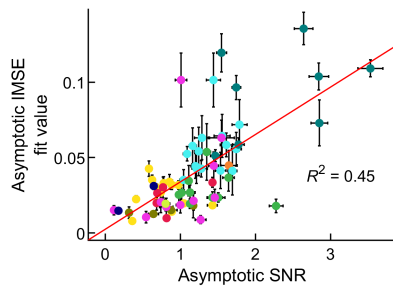

k (proposed) - Area between curves effect on N_{50} (real - shuffled, up to PC10)

```
figure;
org.correlogram('delta_cos2_area_10', 'invN50', true);
```

```
Using only 71 out of 107 sessions
Mouse-aggregated correlations delta_cos2_area_10 vs. invN50: adj. R^2 = 0.608
Pearson: 0.807, p = 4.731966e-03, **
Spearman: 0.782, p = 1.165127e-02, *
Kendall: 0.644, p = 9.148479e-03, **
```

```
xlabel '\Delta signal-noise cos^2 overlap (PC1-10)'
ylabel '1/{\itN} fit value'
Nvals = [200 100 65 50];
Nlabels = arrayfun(@(x)['1/' num2str(x)],Nvals,'UniformOutput',false);
```

```
set(gca, 'YTick', 1./Nvals);
set(gca, 'YTickLabels', Nlabels);
figure_format([4 3]/2.5);
```
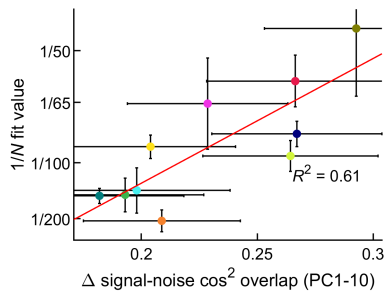


```
figure;
org.correlogram('delta_cos2_area_10', 'invN50', false);
```

```
Using only 71 out of 107 sessions
Sessionwise correlations delta_cos2_area_10 vs. invN50: adj. R^2 = 0.218
Pearson: 0.479, p = 2.403883e-05, ***
Spearman: 0.406, p = 4.381538e-04, ***
Kendall: 0.281, p = 5.407923e-04, ***
```

```
xlabel '\Delta signal-noise cos^2 overlap (PC1-10)'
ylabel '1/{\itN} fit value'
Nvals = [200 65 40 30];
Nlabels = arrayfun(@(x)['1/' num2str(x)],Nvals,'UniformOutput',false);
set(gca, 'YTick', 1./Nvals);
set(gca, 'YTickLabels', Nlabels);
figure_format([4 3]/2.5);
```