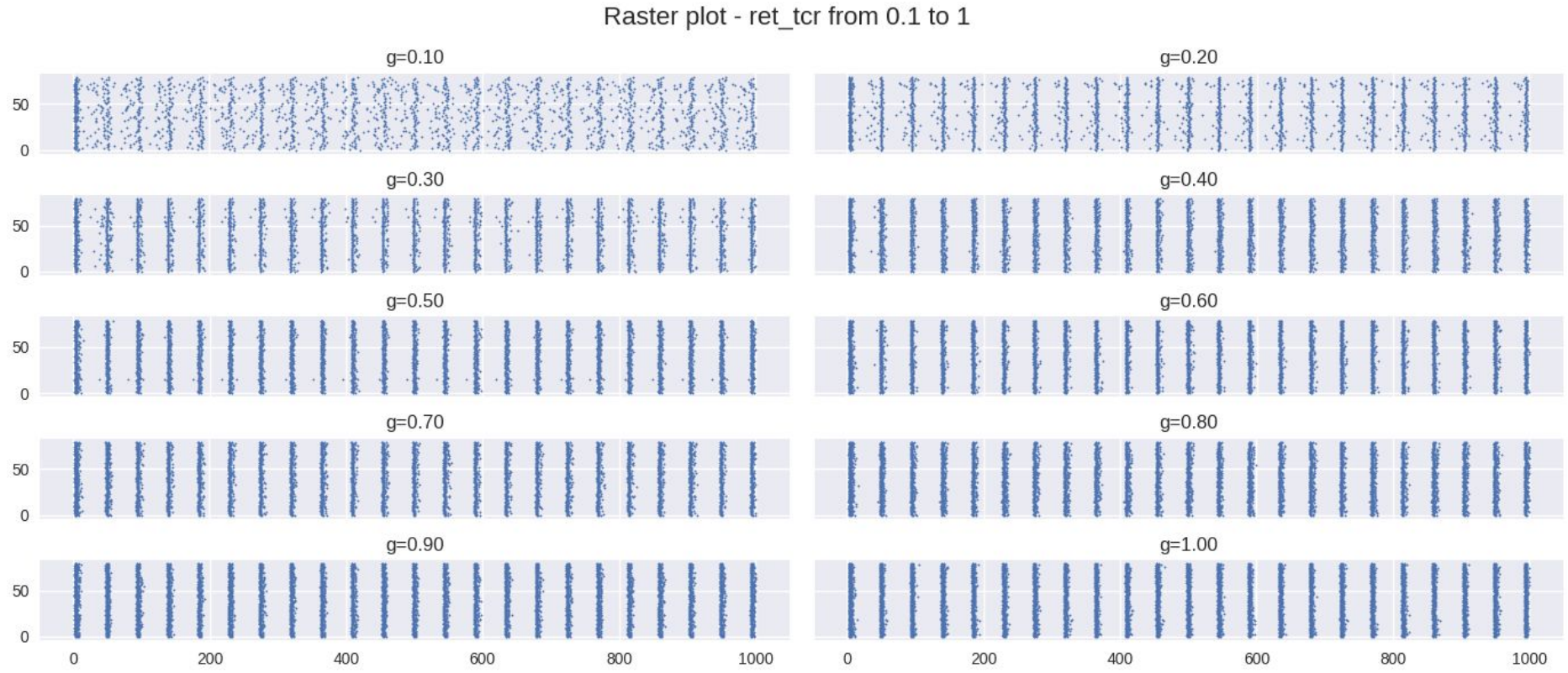
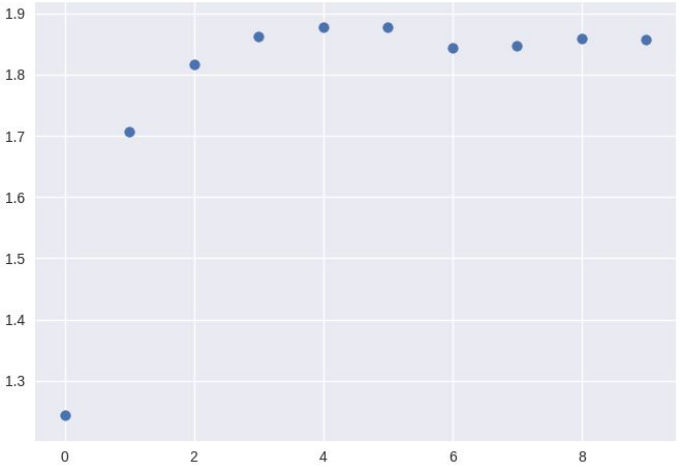
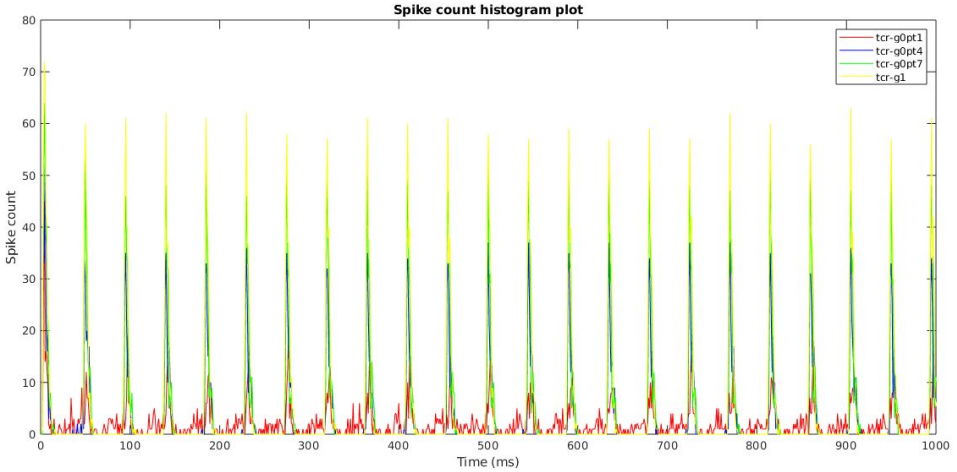
Simulating variation of spike synchrony and periodicity with synaptic conductance on sPyNNaker model of LGN

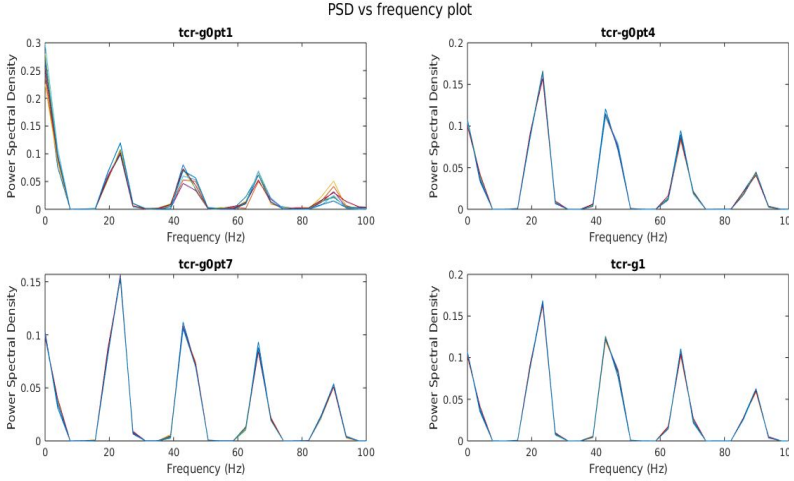
Retina-TCR
Increasing g from 0.1 to 1

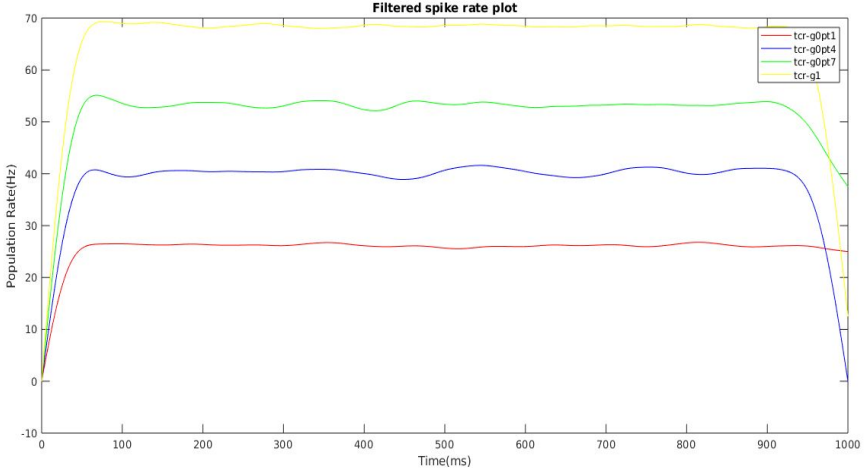

Raster plot - ret_tcr from 0.1 to 1
g=0.10
g=0.20
g=0.30
g=0.40
g=0.50
g=0.60
g=0.70
g=0.80
g=0.90
g=1.00
0
50
0
200
400
600
800
1000

Synchrony measure vs trial

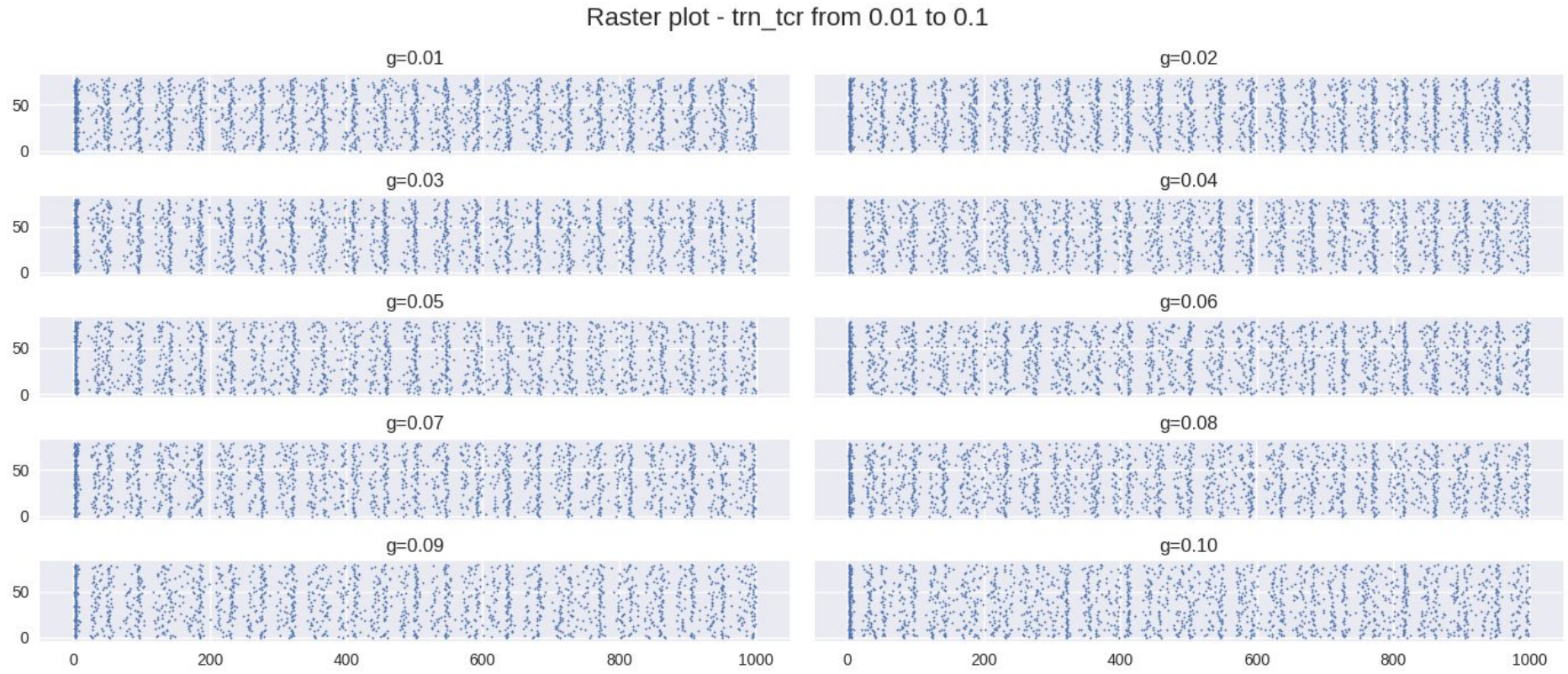




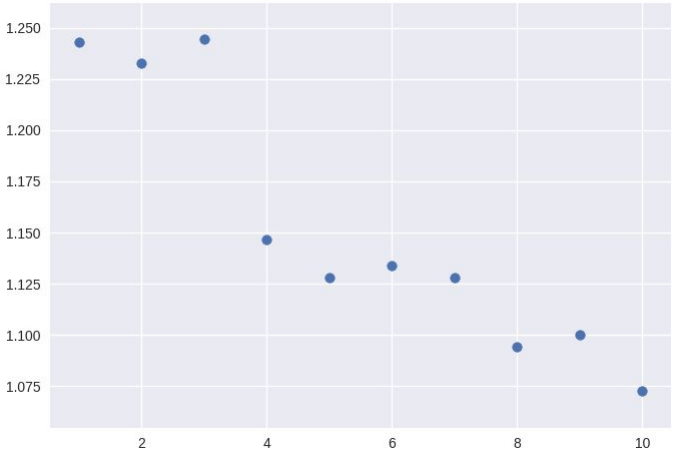


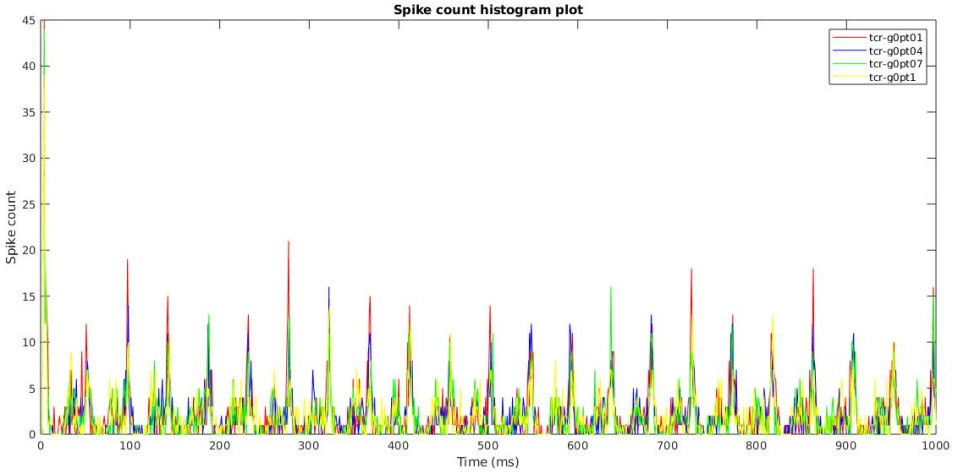


TRN-TCR
Increasing g from 0.01 to 0.1

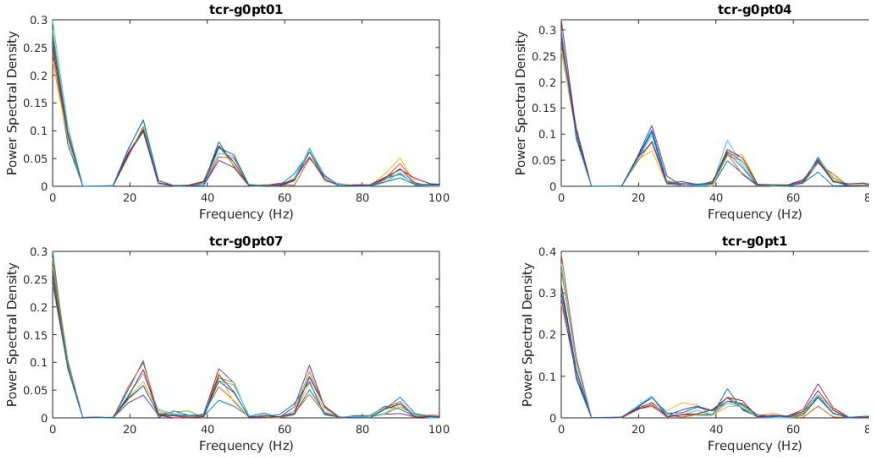

Raster plot - trn_tcr from 0.01 to 0.1
g=0.01
g=0.02
g=0.03
g=0.04
g=0.05
g=0.06
g=0.07
g=0.08
g=0.09
g=0.10
0
50
0
200
400
600
800
1000

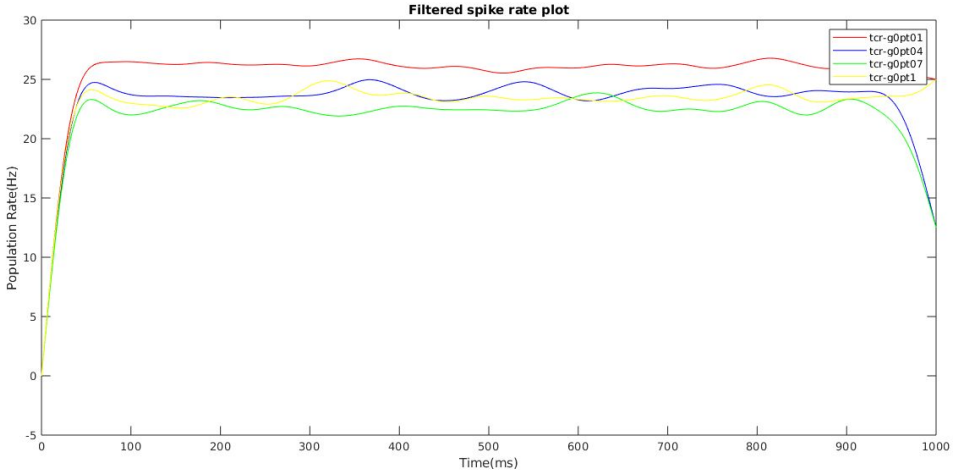
Synchrony measure vs trial



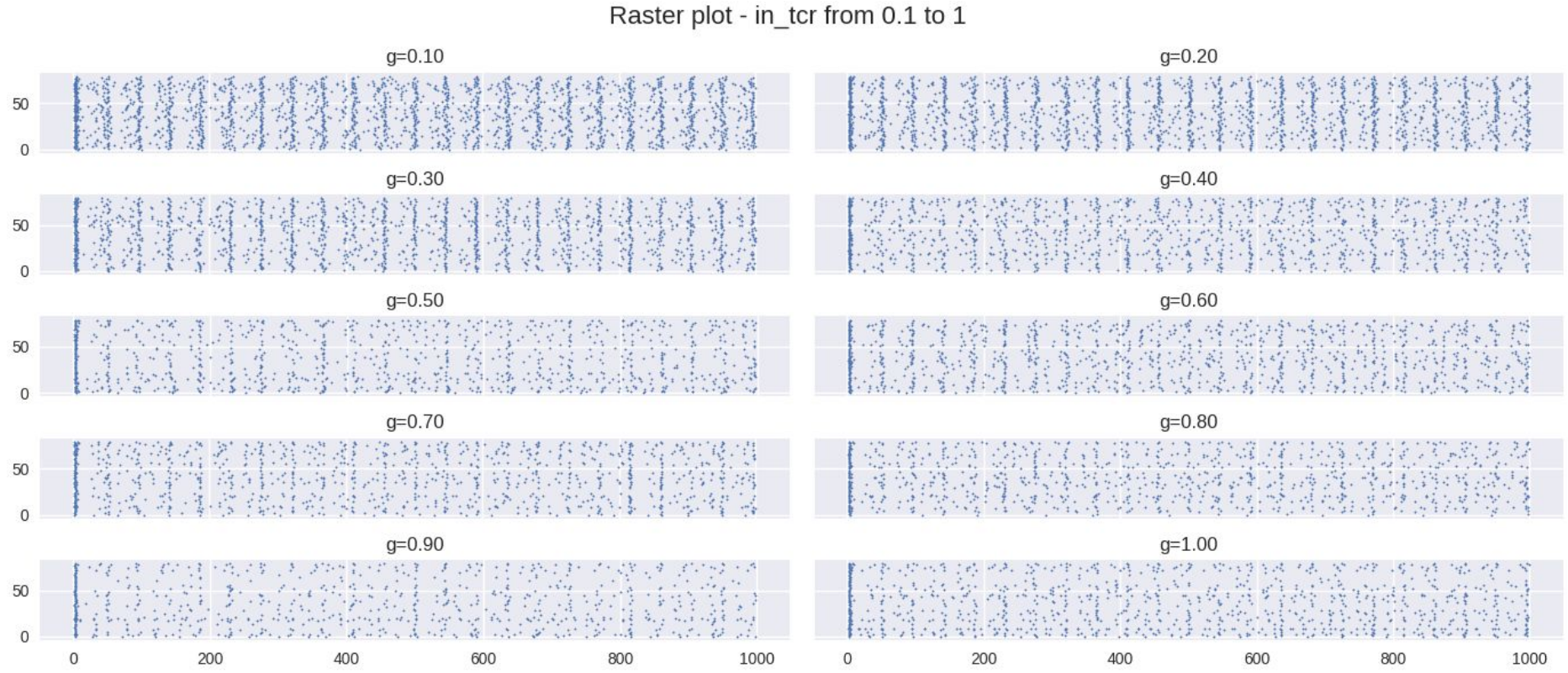


PSD vs frequency plot

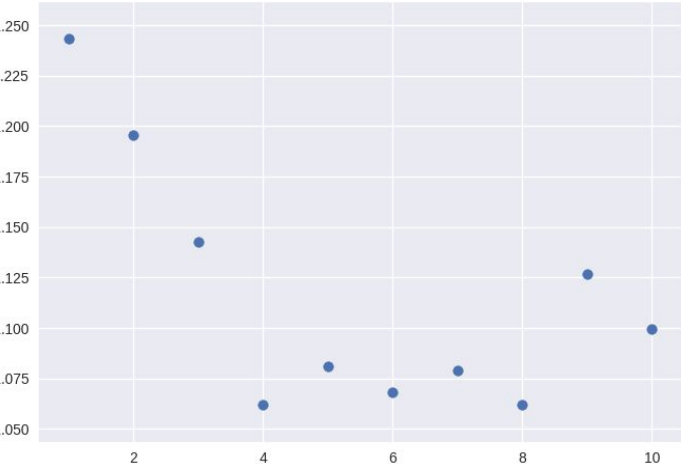


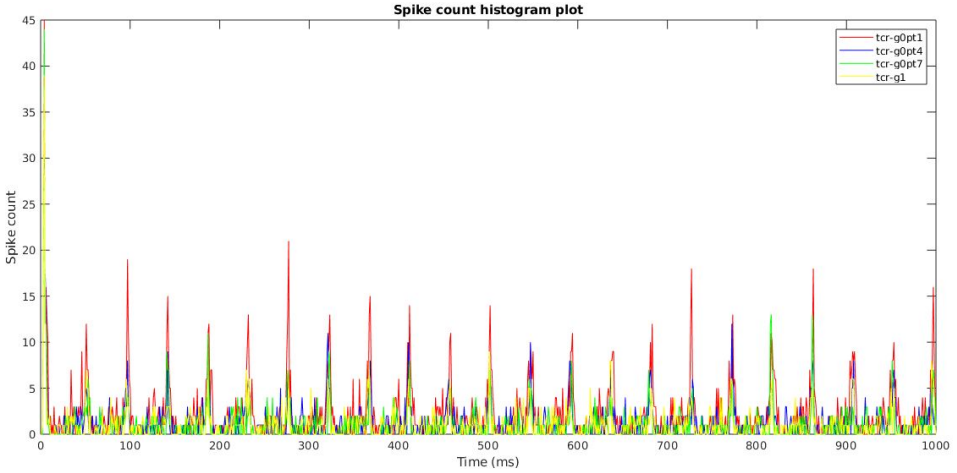


IN-TCR
Increasing g from 0.1 to 1

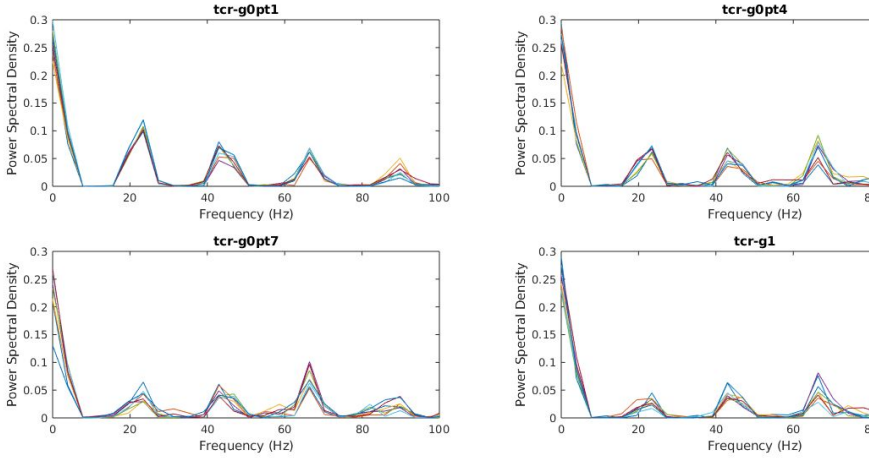

Raster plot - in_tcr from 0.1 to 1
g=0.10
g=0.20
g=0.30
g=0.40
g=0.50
g=0.60
g=0.70
g=0.80
g=0.90
g=1.00
0
50
0
200
400
600
800
1000

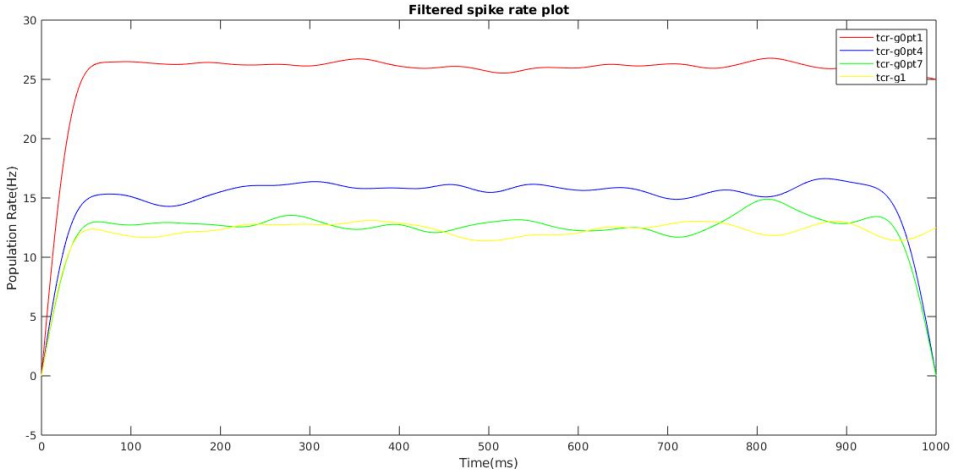
Synchrony measure vs trial



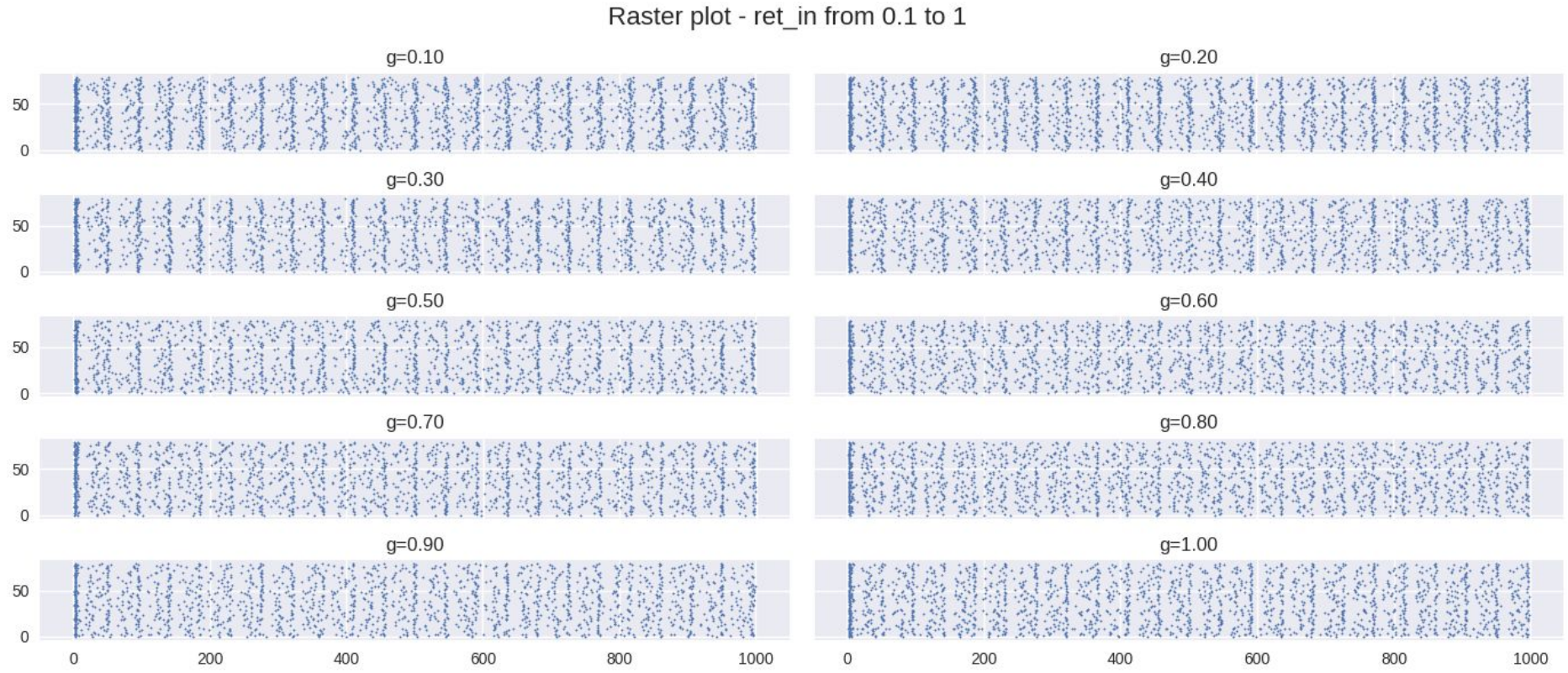


PSD vs frequency plot

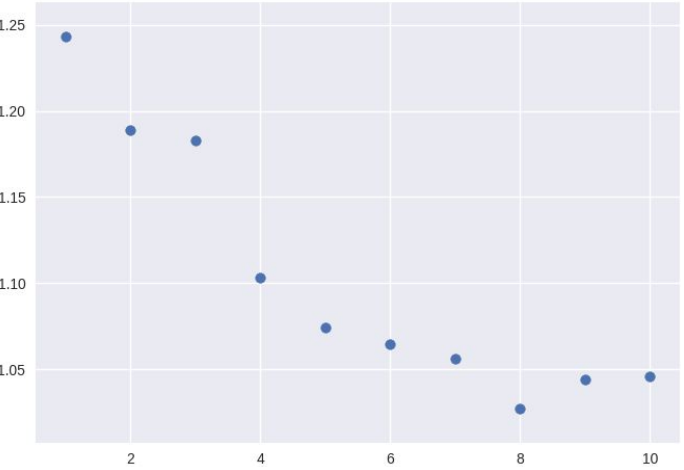


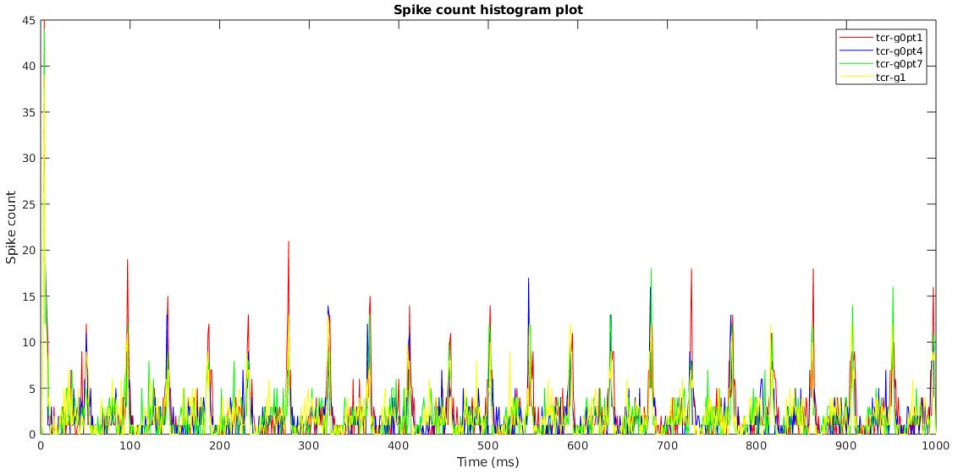


Retina-IN
Increasing g from 0.1 to 1

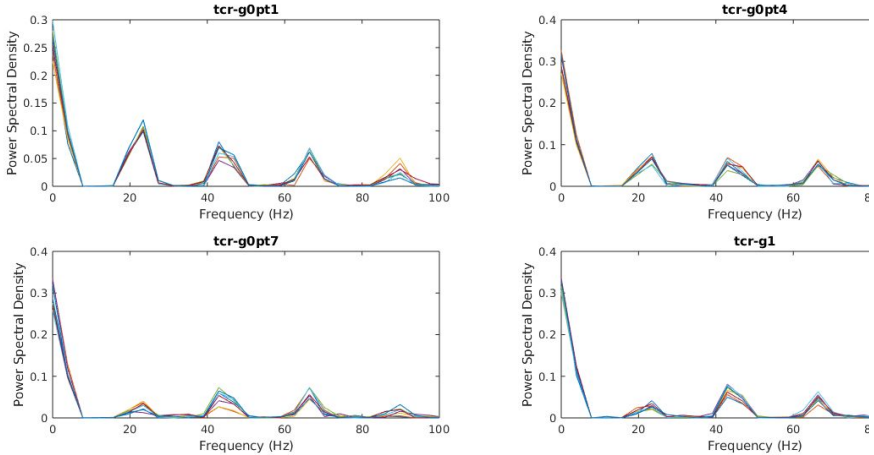

Raster plot - ret_in from 0.1 to 1
g=0.10
g=0.20
g=0.30
g=0.40
g=0.50
g=0.60
g=0.70
g=0.80
g=0.90
g=1.00
0
50
0
200
400
600
800
1000

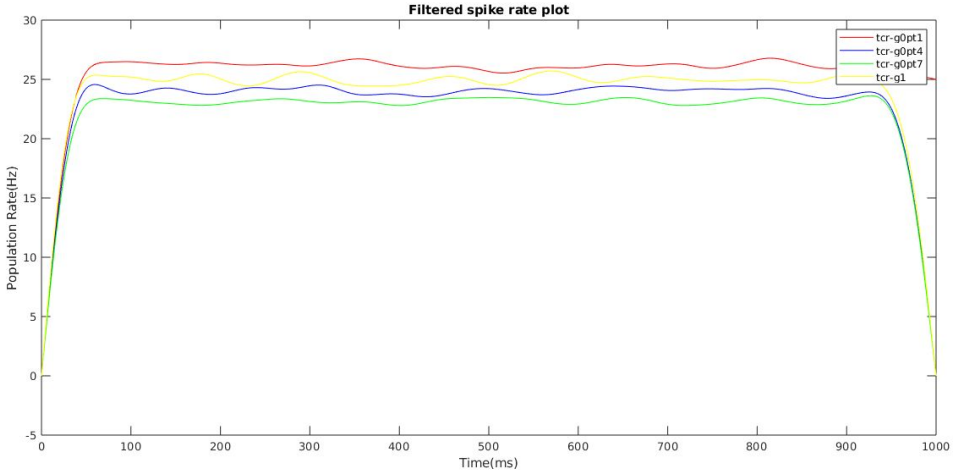
Synchrony measure vs trial



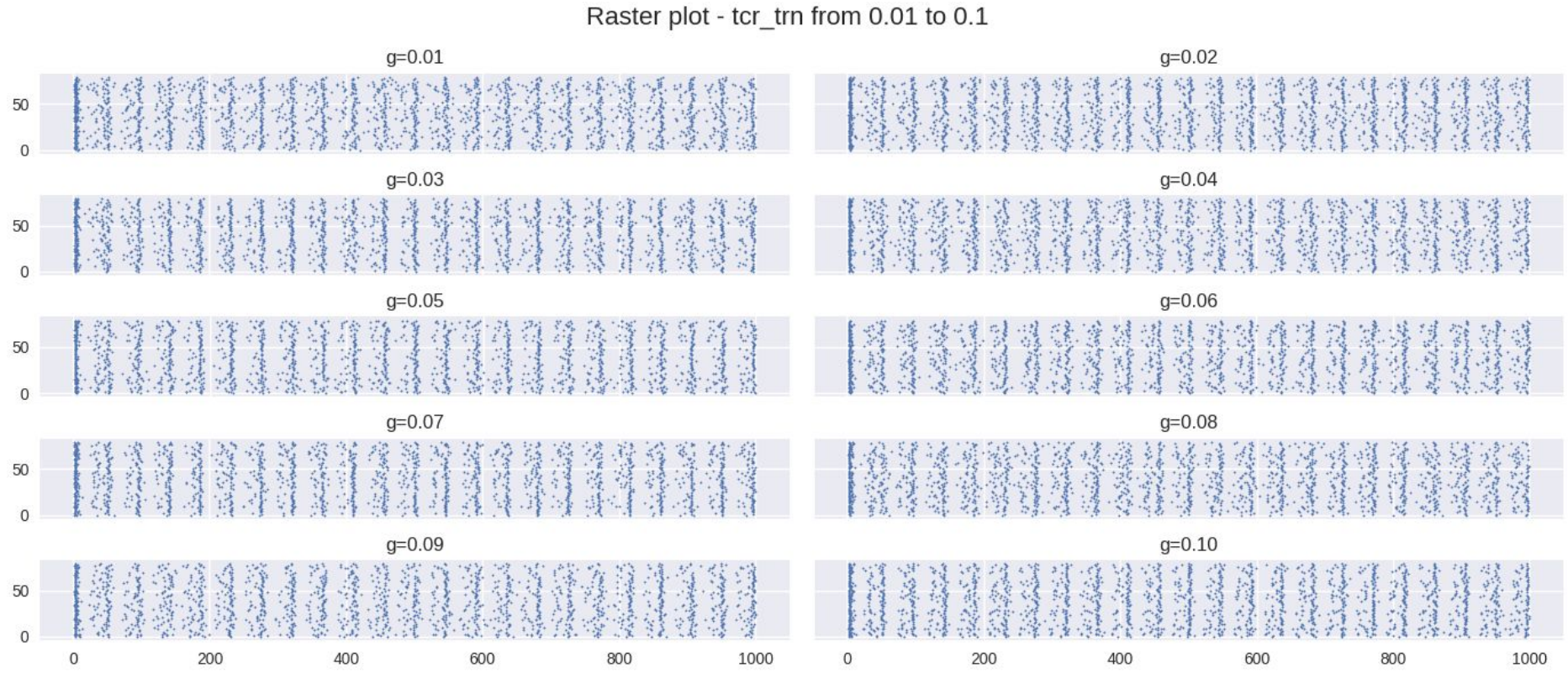


PSD vs frequency plot

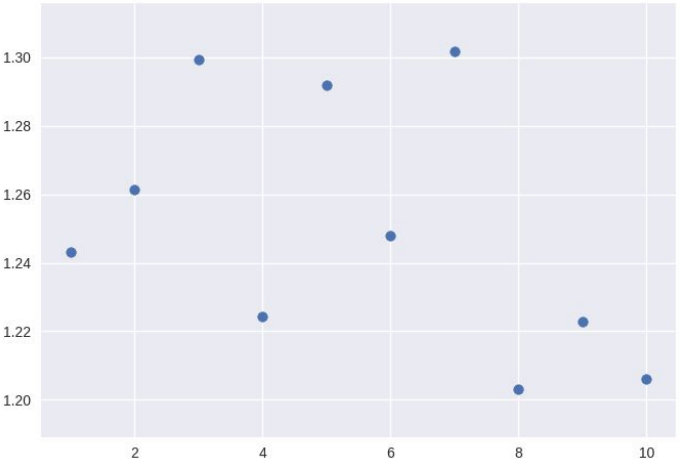


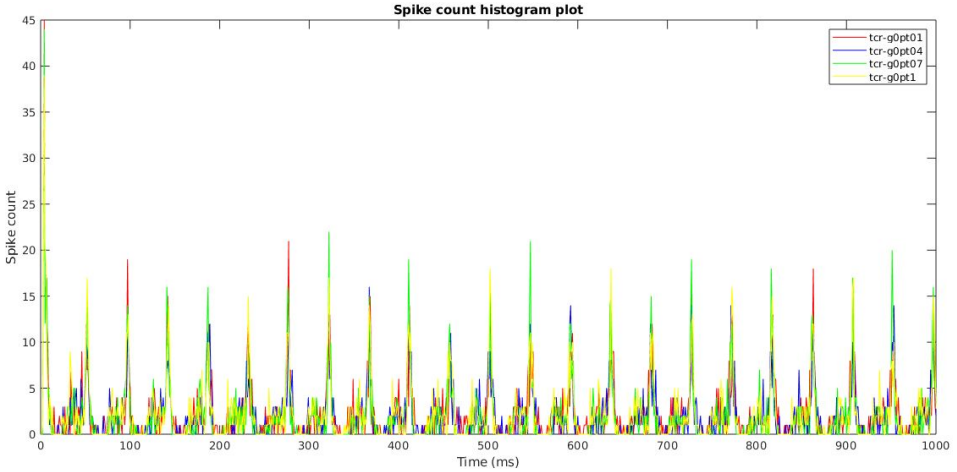


TCR-TRN
Increasing g from 0.01 to 1

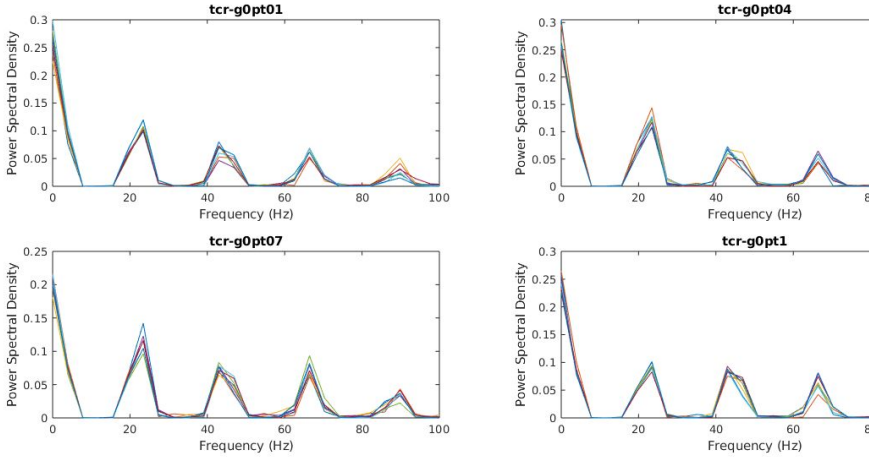

Raster plot - tcr_trn from 0.01 to 0.1
g=0.01
g=0.02
g=0.03
g=0.04
g=0.05
g=0.06
g=0.07
g=0.08
g=0.09
g=0.10
0
50
0
200
400
600
800
1000

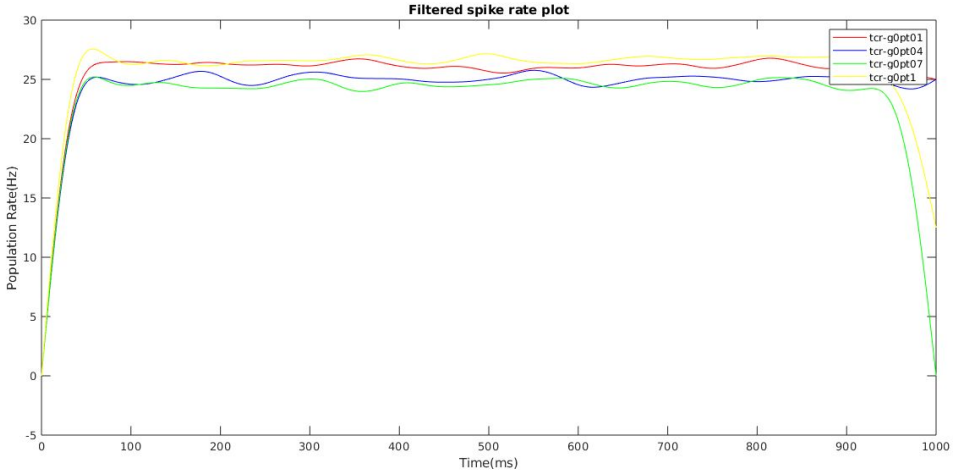
Synchrony measure vs trial



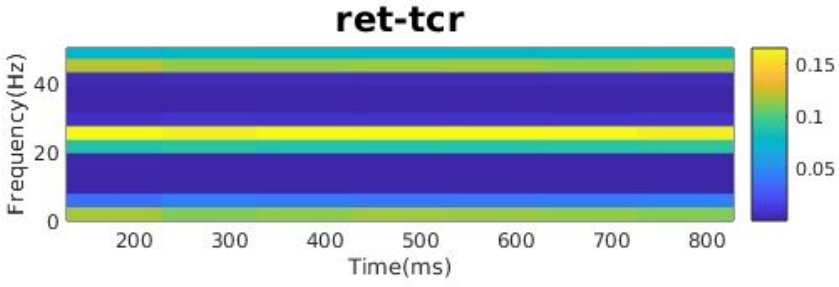


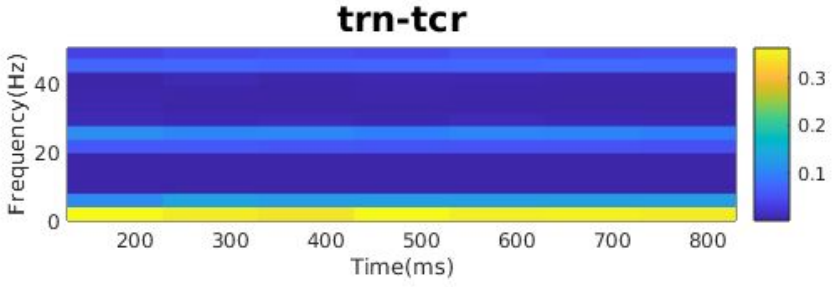
PSD vs frequency plot

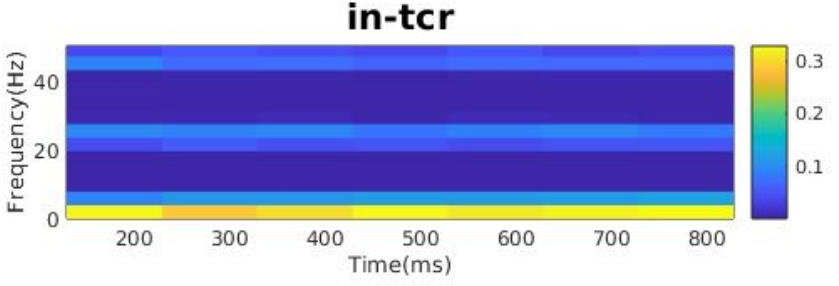


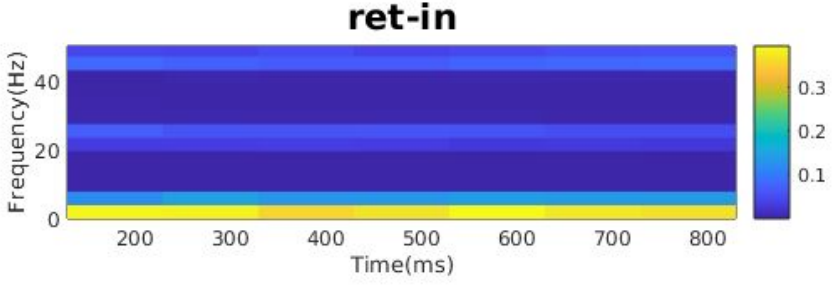


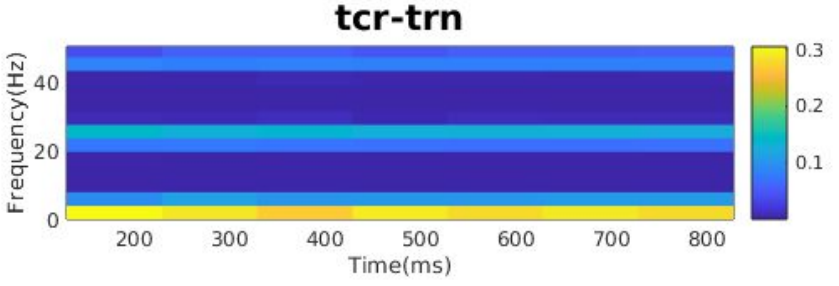
Concatenated PSD colormaps











References

- Synchrony measure: Khoshkhou and Montakhab (2018) [https://doi.org/10.3389/fncom.2018.00059]
- LGN model: Sen-Bhattacharya et al. (2017) [https://doi.org/10.3389/fnins.2017.00454]