NJN-Korrelatoren

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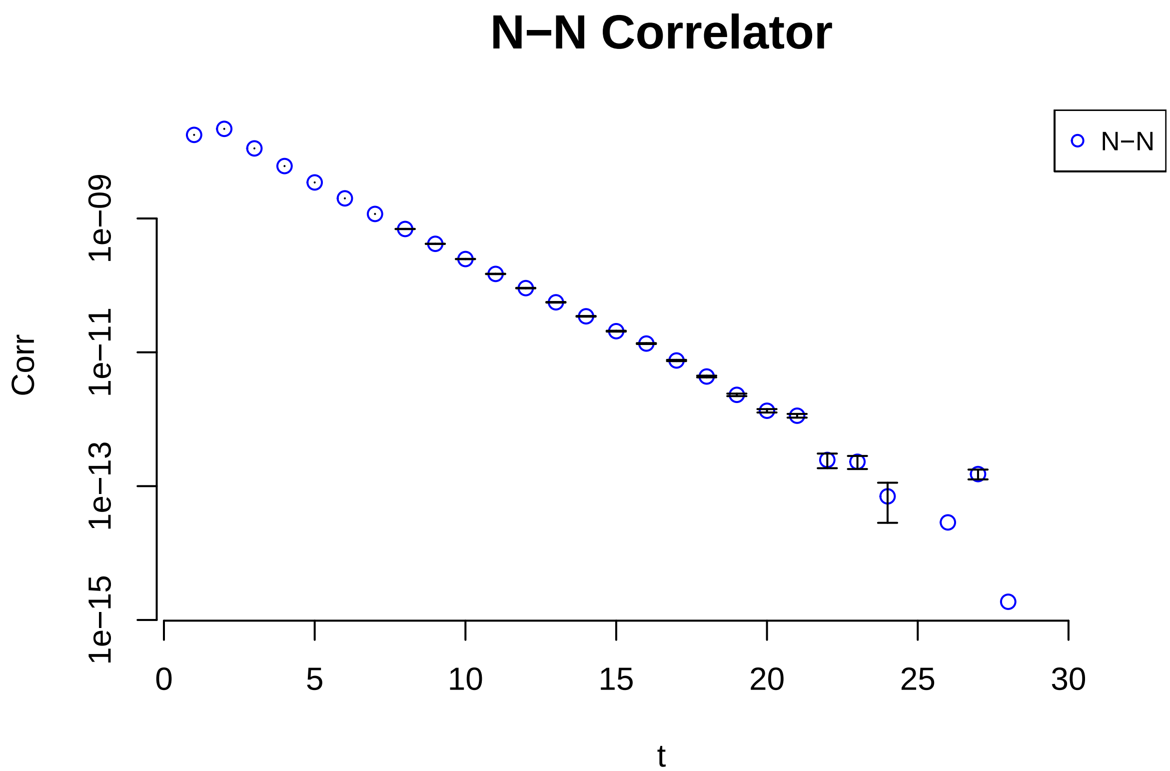
November 14, 2019

NN-Correlator

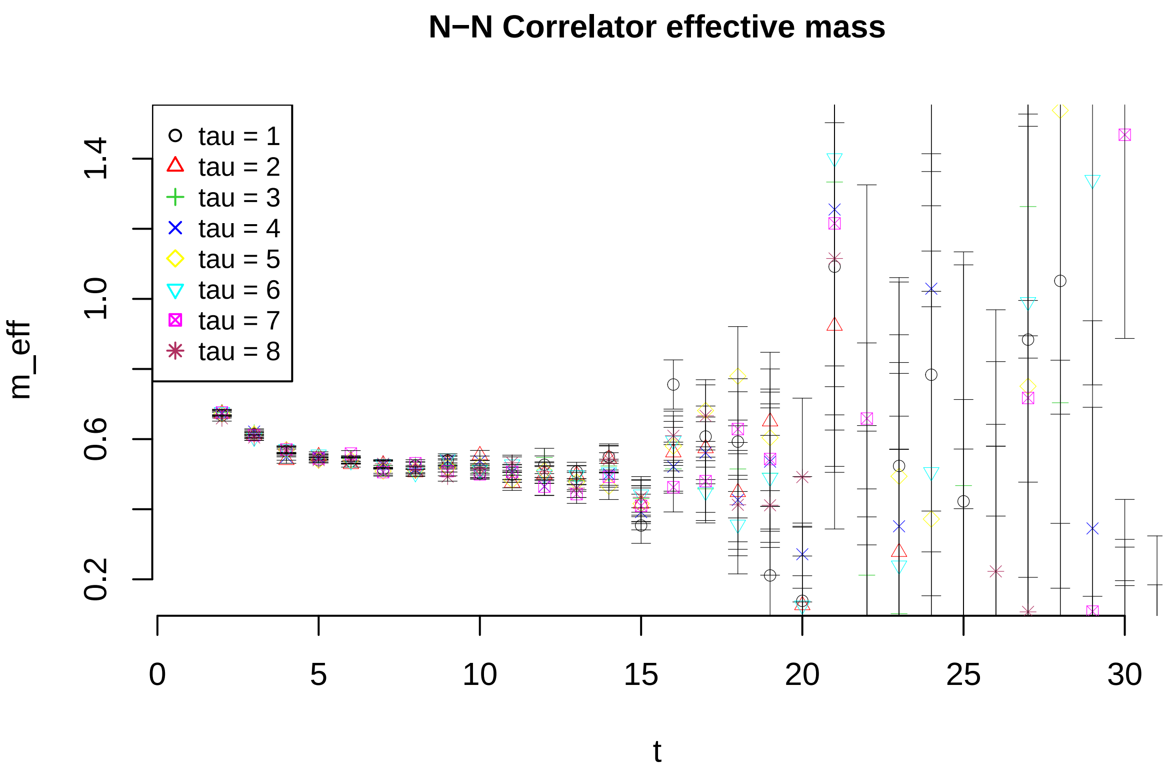
```
## [1] "N-N, T=64, n_src=16, n_conf=52, projector_sign = 1, Gi = Gi_Cg5, Gf = Gf_Cg5"
## [1] "Not symmetrized:"
##  [1]  3.138929e-08  4.189843e-08  2.150166e-08  1.178047e-08  6.737046e-09
##  [6]  3.909836e-09  2.293884e-09  1.369821e-09  8.229783e-10  4.884415e-10
## [11]  2.934970e-10  1.802801e-10  1.109680e-10  6.815904e-11  4.045326e-11
## [16]  2.586960e-11  1.505573e-11  8.041328e-12  4.132557e-12  2.247563e-12
## [21]  1.934810e-12  5.331282e-13  6.138230e-13  2.115480e-13  1.777422e-14
## [26]  1.634820e-13  2.525687e-13  9.161577e-14 -1.143594e-13 -1.779636e-13
## [31] -6.411404e-14 -1.525380e-13 -1.256203e-13 -1.188195e-13 -1.435287e-13
## [36] -8.787266e-14  5.019986e-14 -1.060528e-13 -1.289247e-13 -7.080130e-14
## [41] -1.513249e-13 -4.104672e-14  3.203445e-13  4.285337e-13  4.936829e-13
## [46]  6.537893e-13  2.524726e-14  1.141706e-12  9.138159e-13  8.322319e-13
## [51]  7.812023e-13  1.658753e-12  3.033211e-12  6.369830e-12  1.235146e-11
## [56]  2.128316e-11  4.073047e-11  8.315665e-11  1.708493e-10  3.494215e-10
## [61]  7.730687e-10  1.717440e-09  4.070301e-09  1.058217e-08
```



Effective Mass

We calculate the effective mass following https://arxiv.org/abs/1612.06963.

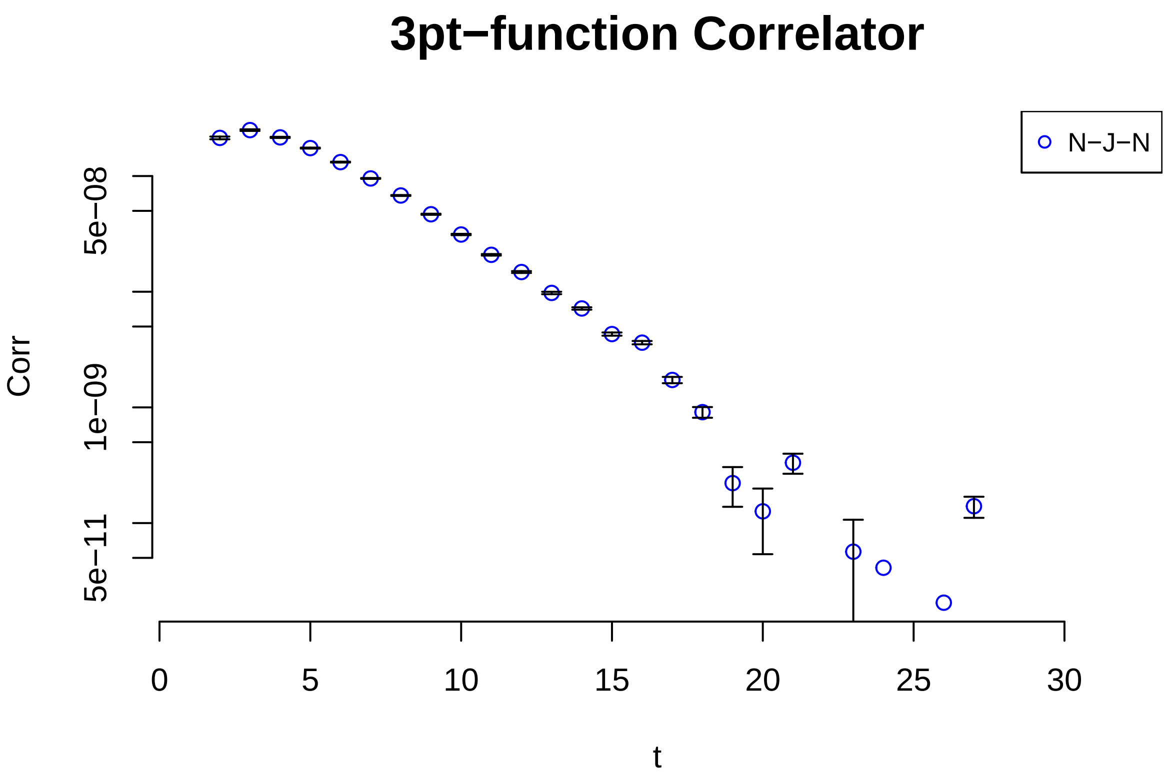
$m^{eff}(t,\tau) = \frac{1}{\tau} ln\left(\frac{C(t)}{C(t+\tau)}\right) \rightarrow_{t\rightarrow\infty} \frac{1}{\tau} ln(e^{E_0\tau}) = E_0$



NJN-Correlator

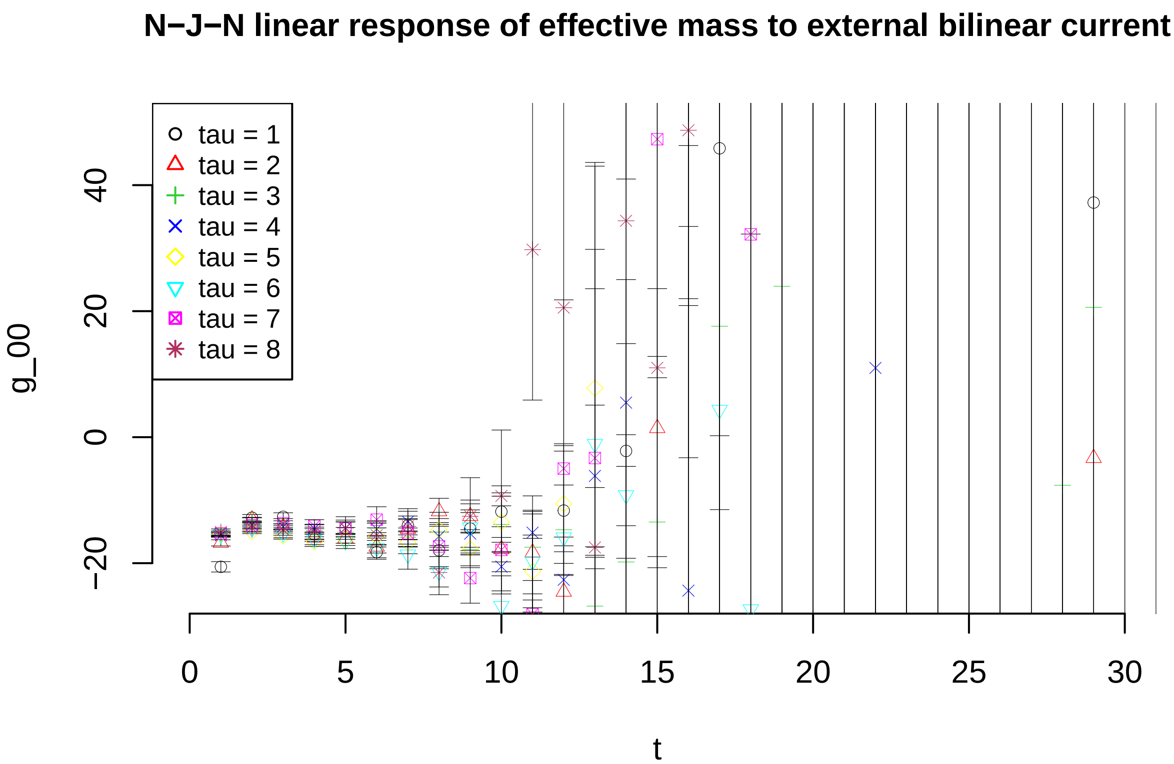
First the 3pt-function correlator:

```
## [1] "N-J-N, T=64, n_src=16, n_conf=52, projector_sign = 1, Gi = Gi_Cg5, Gf = Gf_Cg5"
## [1] "Not symmetrized:"
##  [1] -6.352481e-07  2.946963e-07  4.264120e-07  3.931507e-07  3.268273e-07
##  [6]  2.520438e-07  1.836871e-07  1.315411e-07  9.016093e-08  6.023876e-08
## [11]  4.075439e-08  2.878446e-08  1.906709e-08  1.367035e-08  8.097763e-09
## [16]  6.242622e-09  3.381827e-09  1.316778e-09  4.749749e-11 -1.989581e-10
## [21]  1.834502e-10 -3.496789e-10  2.782545e-10  1.469098e-10  5.248075e-11
## [26]  2.024508e-10  2.522718e-10  8.043839e-11 -1.206293e-10 -1.899151e-10
## [31] -1.087354e-10 -2.288925e-10 -1.919902e-10 -1.820207e-10 -2.410972e-10
## [36] -1.384077e-10  2.746615e-11 -1.614706e-10 -1.676140e-10 -6.476019e-11
## [41] -1.651349e-10 -1.962057e-11  4.812080e-10  4.514872e-10  3.954348e-10
## [46]  5.025582e-10  7.114292e-11  1.014814e-09  5.121806e-10  6.625482e-10
## [51]  4.542254e-10  8.150633e-10  9.487951e-10  2.243205e-09  3.331700e-09
## [56]  4.262308e-09  7.005913e-09  1.195262e-08  2.219146e-08  3.852854e-08
## [61]  7.277659e-08  1.327885e-07  2.502722e-07  4.961353e-07
```



Ratio-Plot

$$\left.\frac{\partial m_{\lambda}^{eff}(t,\tau)}{\partial \lambda}\right|_{\lambda=0} = \frac{1}{\tau}\left(\frac{\partial_{\lambda} C_{\lambda}(t)}{C(t)} - \frac{\partial_{\lambda} C_{\lambda}(t+\tau)}{C(t+\tau)}\right)_{\lambda=0}$$




```
## [1] "tau = 1"
##  [1]    -20.573820   -12.784782   -12.635064   -15.395199   -14.445142
##  [6]    -18.248383   -14.008899   -17.968411   -14.508199   -11.814024
## [11]    -31.834914   -11.647820   -28.934787    -2.184557   -44.340703
## [16]     55.918438    45.841446   361.528595   206.152437   490.965320
## [21] -6291.104525  6356.633404 -4446.089556  2098.085715  -533.922803
## [26] -1794.921621  1991.671180   206.367058    37.234327    54.441409
## [31]     68.747707           NA
## [1] "tau = 2"
##  [1]    -16.775596   -13.095844   -14.235696   -15.957253   -16.087991
##  [6]    -17.385861   -14.565079   -11.774776   -12.528804   -17.782710
## [11]    -18.326393   -24.534323   -29.250645   -43.244941     1.427557
## [16]     54.627570   141.437580   168.149489   -60.665873 -3616.421822
## [21] -1087.556781  2778.963999   588.723480   259.145050    58.793024
## [26]  2259.389467  -391.741829 -2477.084664    -3.318684  -185.242617
## [31]            NA
## [1] "tau = 3"
##  [1]   -15.497076  -13.162846  -14.503237  -14.818558  -15.086773
##  [6]   -14.425427  -15.870695  -15.046554  -17.815187  -13.842655
## [11]   -17.462897  -14.685871  -26.810915  -19.806607  -13.464102
## [16]    56.434322   17.601955  -57.083534   23.939444  -39.178303
## [21] -175.546440 -294.769101 -384.464189  157.780770 -108.729266
## [26]    88.141631 -177.350624   -7.637682   20.599018          NA
## [1] "tau = 4"
##  [1]   -15.573321  -13.910687  -14.195691  -14.511683  -14.398073
```

```
## [6] -14.577516 -13.393548 -15.734754 -15.304565 -20.538730
## [11] -15.146726 -22.636535 -6.153130 5.480542 54.038302
## [16] -24.349707 -80.993208 84.694862 -214.294176 -537.484022
## [21] -38.224591 10.984368 -404.099808 519.936929 -124.466279
## [26] -334.442460 198.990001 -258.306822 NA
## [1] "tau = 5"
## [1] -15.370131 -14.943765 -15.695663 -16.576746 -16.234001
## [6] -15.714046 -16.686787 -14.691486 -17.696351 -13.480769
## [11] -21.304022 -10.538916 7.788767 78.670764 384.996408
## [16] 122.710198 -390.118855 -289.799965 -321.109104 -604.139839
## [21] -441.545850 619.089553 20548.058542 -65.699292 -219.917565
## [26] -860.736114 -593.052655 NA
## [1] "tau = 6"
## [1] -15.420024 -14.474124 -15.281724 -16.207066 -16.515754
## [6] -17.572342 -18.612428 -21.357955 -14.292033 -26.775351
## [11] -19.671686 -15.902472 -1.060767 -9.188636 -40.331203
## [16] 56.415540 4.341413 -27.302485 -170.465585 -108.673389
## [21] -93.773402 -189.142574 -183.552756 -169.691716 -496.722627
## [26] -120.799375 NA
## [1] "tau = 7"
## [1] -15.248899 -13.976559 -13.644392 -14.076838 -14.470661
## [6] -13.091042 -15.250163 -17.346184 -22.362475 -17.888384
## [11] -28.083774 -4.982217 -3.311438 -43.963787 47.288634
## [16] -68.320159 -301.073225 32.186555 -220.204872 -144.044281
## [21] -118.757016 -185.632872 -69.345570 122.860940 -212.116384
## [26] NA
## [1] "tau = 8"
## [1] -15.047055 -14.421672 -14.662896 -14.995021 -14.416498
## [6] -15.544487 -14.157246 -21.472943 -12.558105 -9.329332
## [11] 29.760288 20.550651 -17.495565 34.338533 11.004975
## [16] 48.706698 -107.846186 -103.900003 -132.705693 -108.616491
## [21] -304.864533 -184.534440 -185.934963 -203.026085 NA
```