Bold Diagrammatic Monte-Carlo for the Unitary Gas

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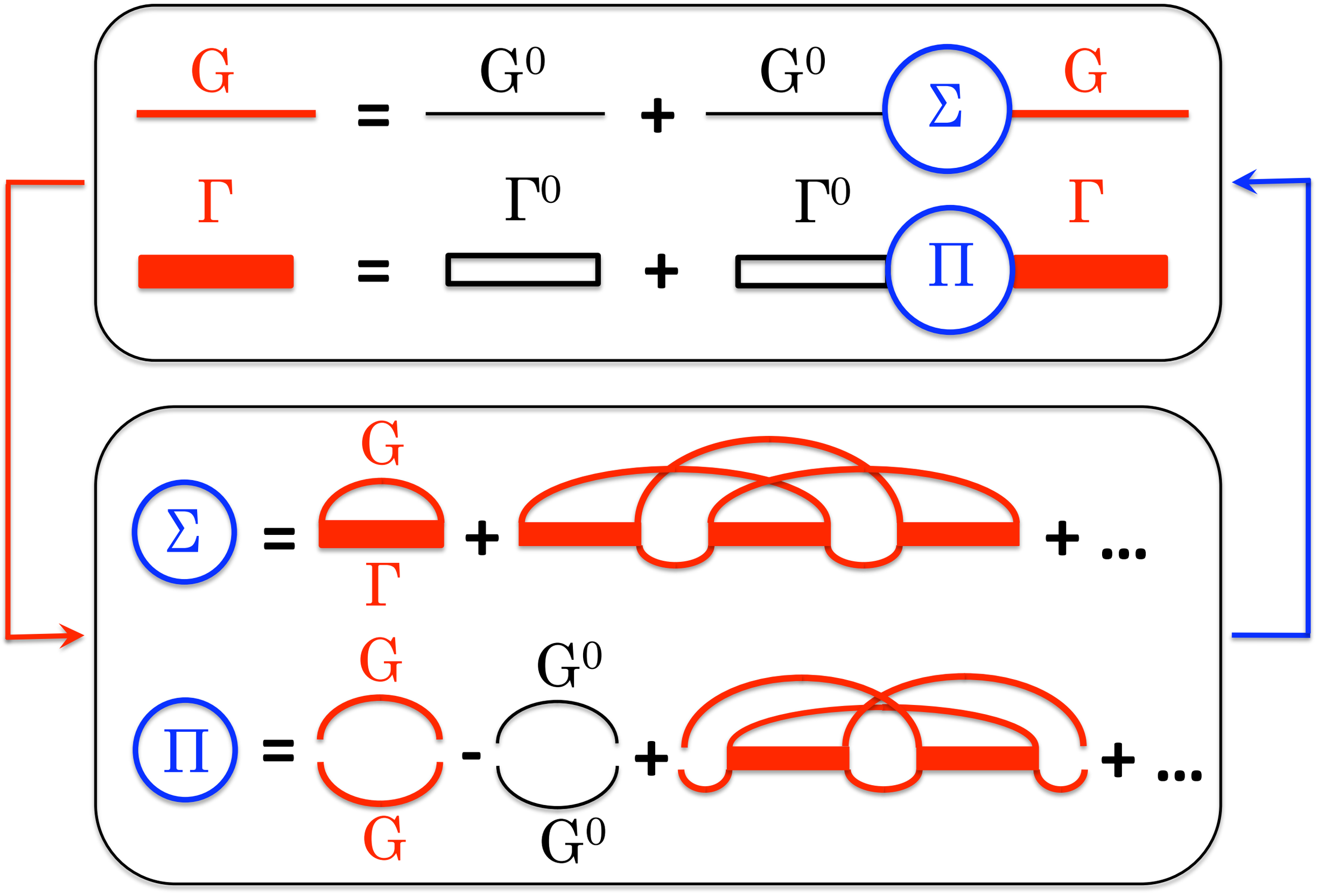
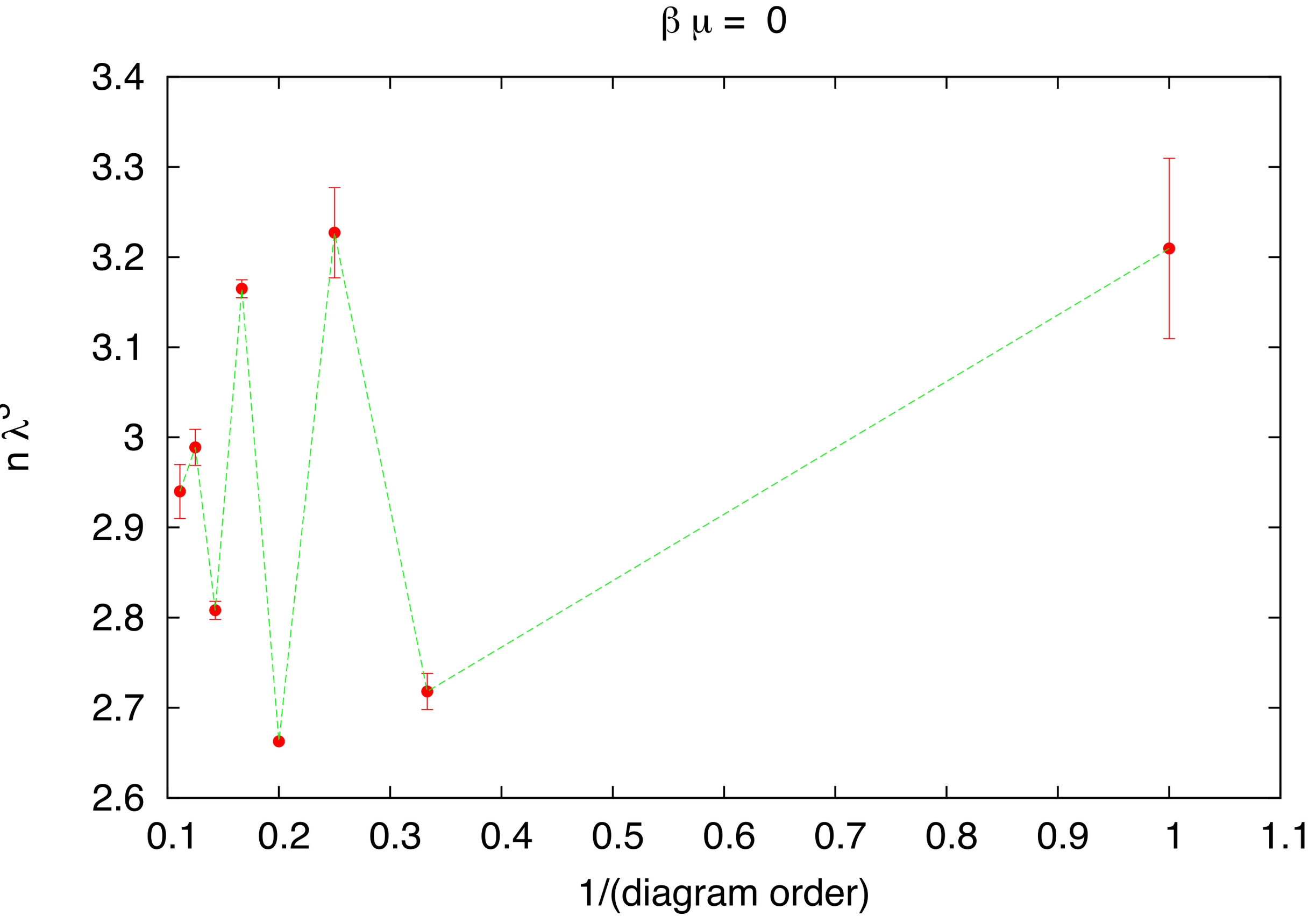
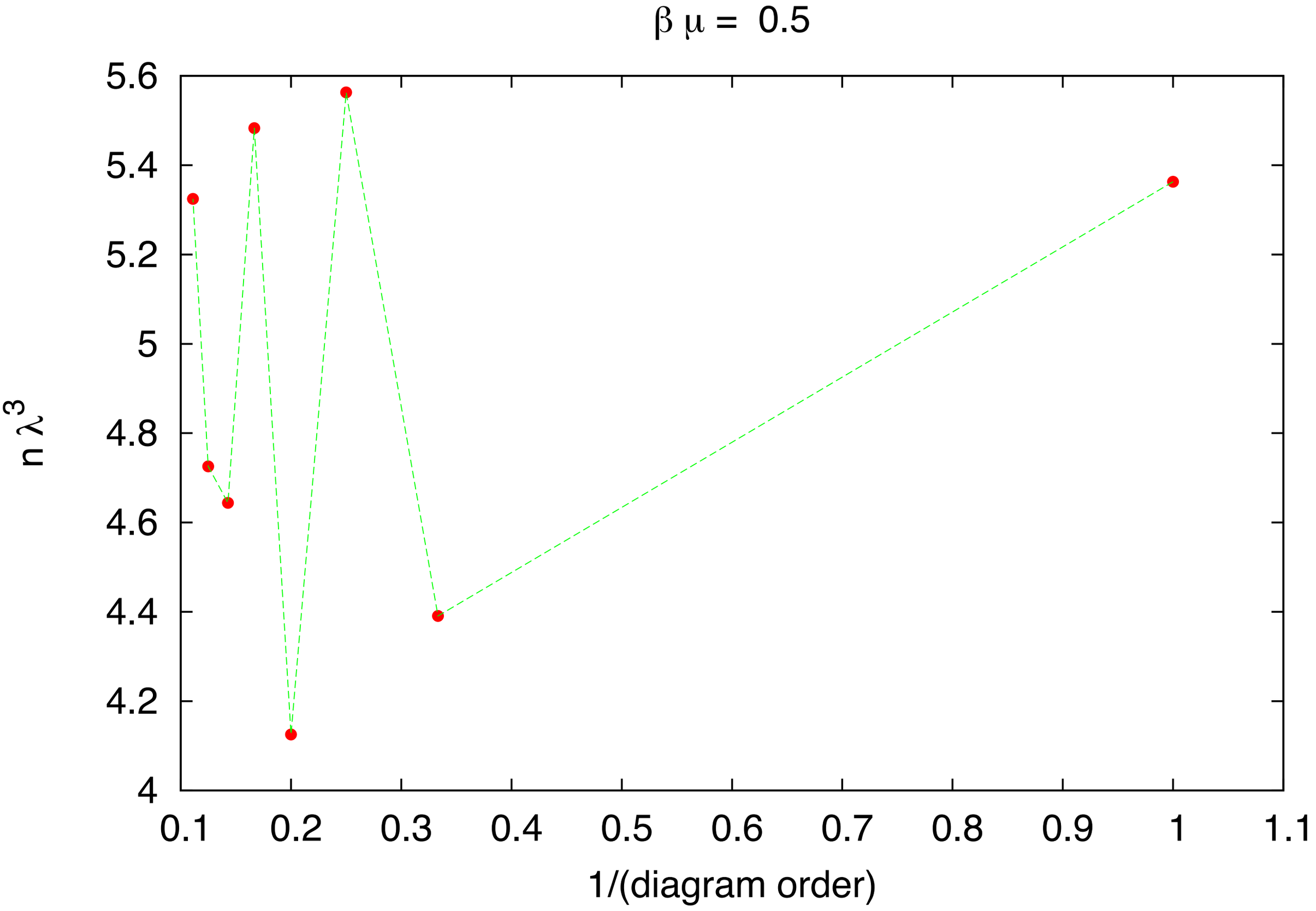
Bold Diagrammatic MC




βμ = 0
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
nλ3
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1/(diagram order)


β μ = 0.5
n λ3
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1/(diagram order)

$\beta\,\mu = +2$

$n\,\lambda^3$

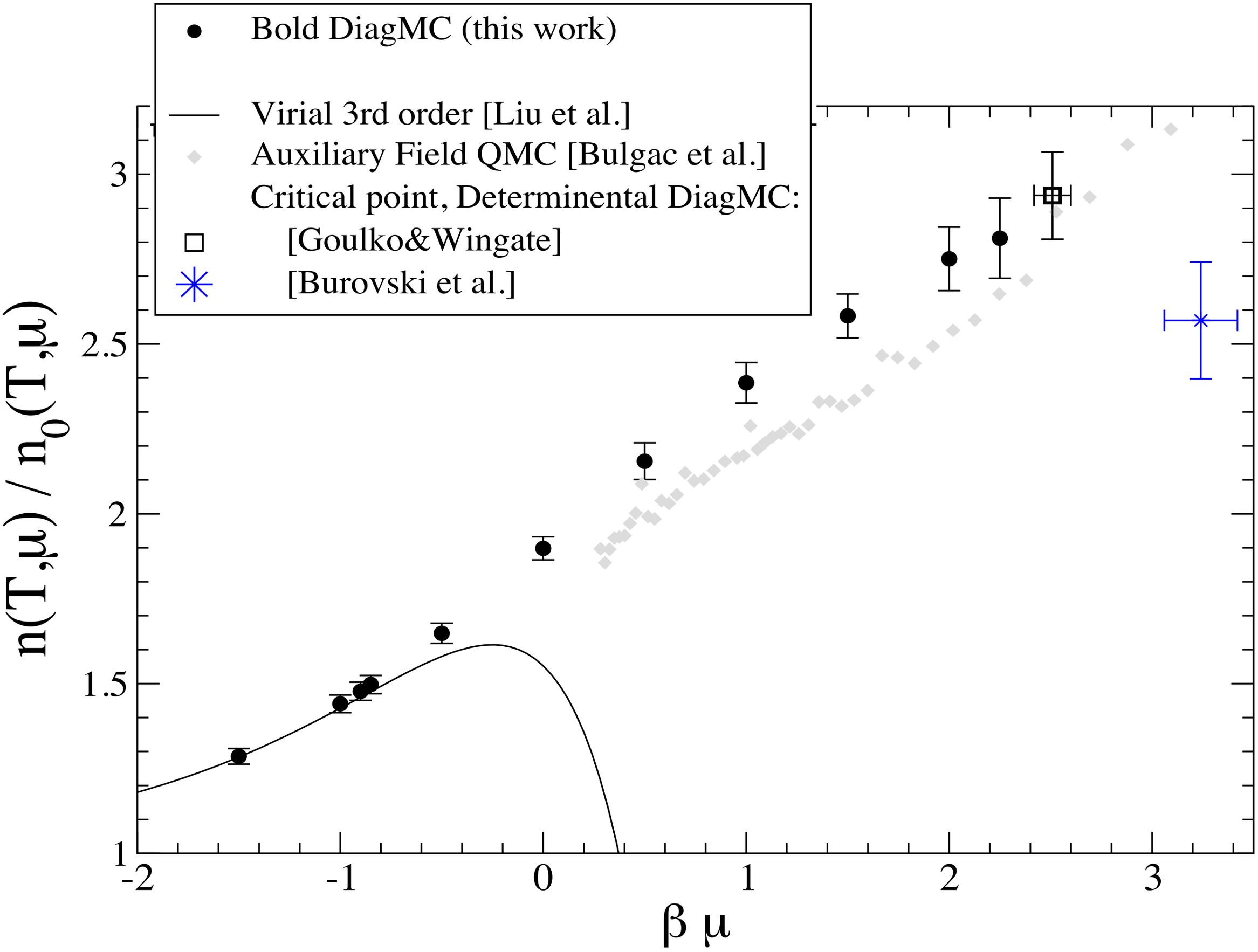
17
16
15
14
13
12
11

0
0.5
1
1.5

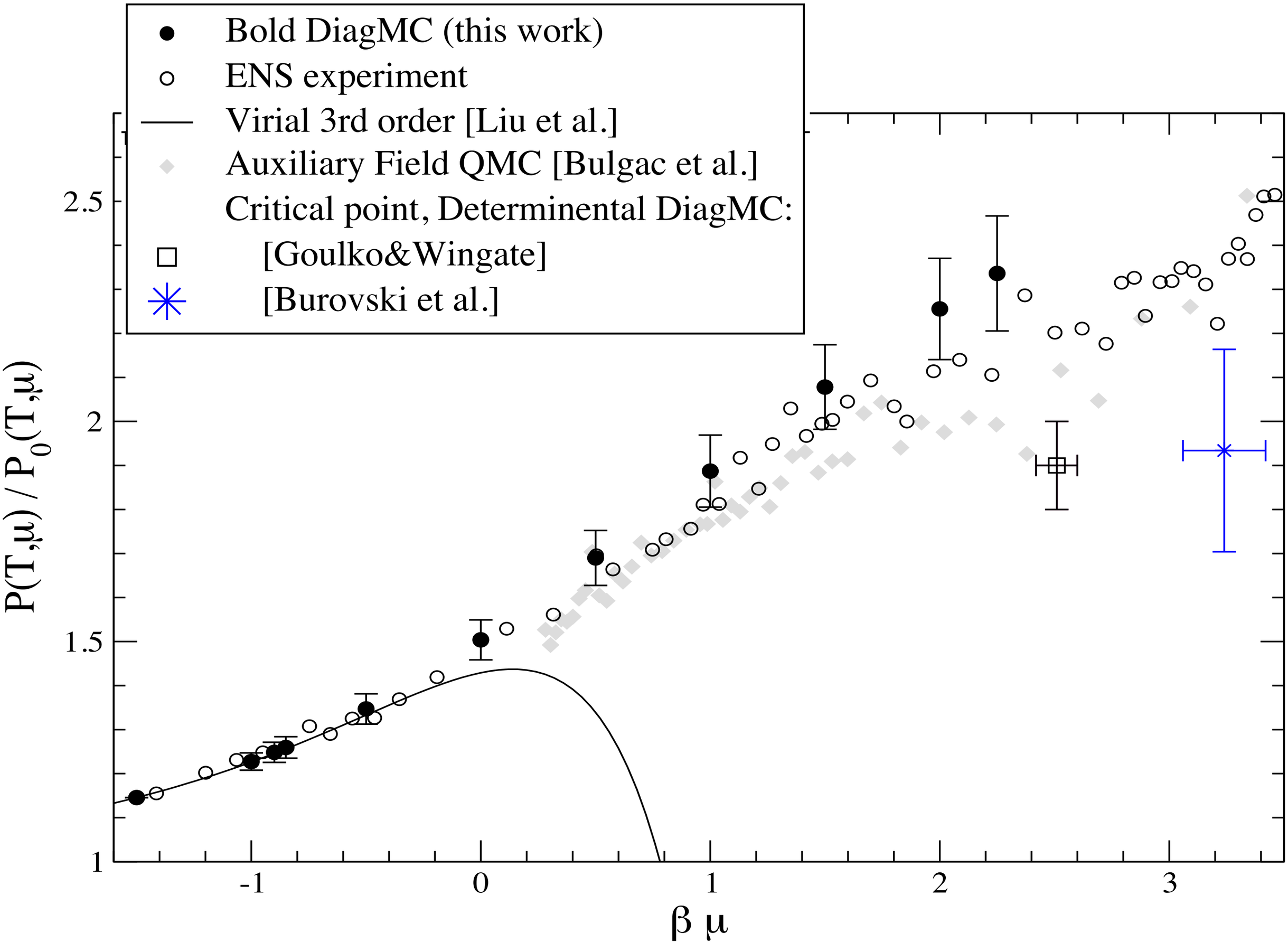
ε

Bold DiagMC: Lindeloef resummation
Gauss resummation
Shifted-Lindeloef resummation
1st order (Haussmann)
3rd order

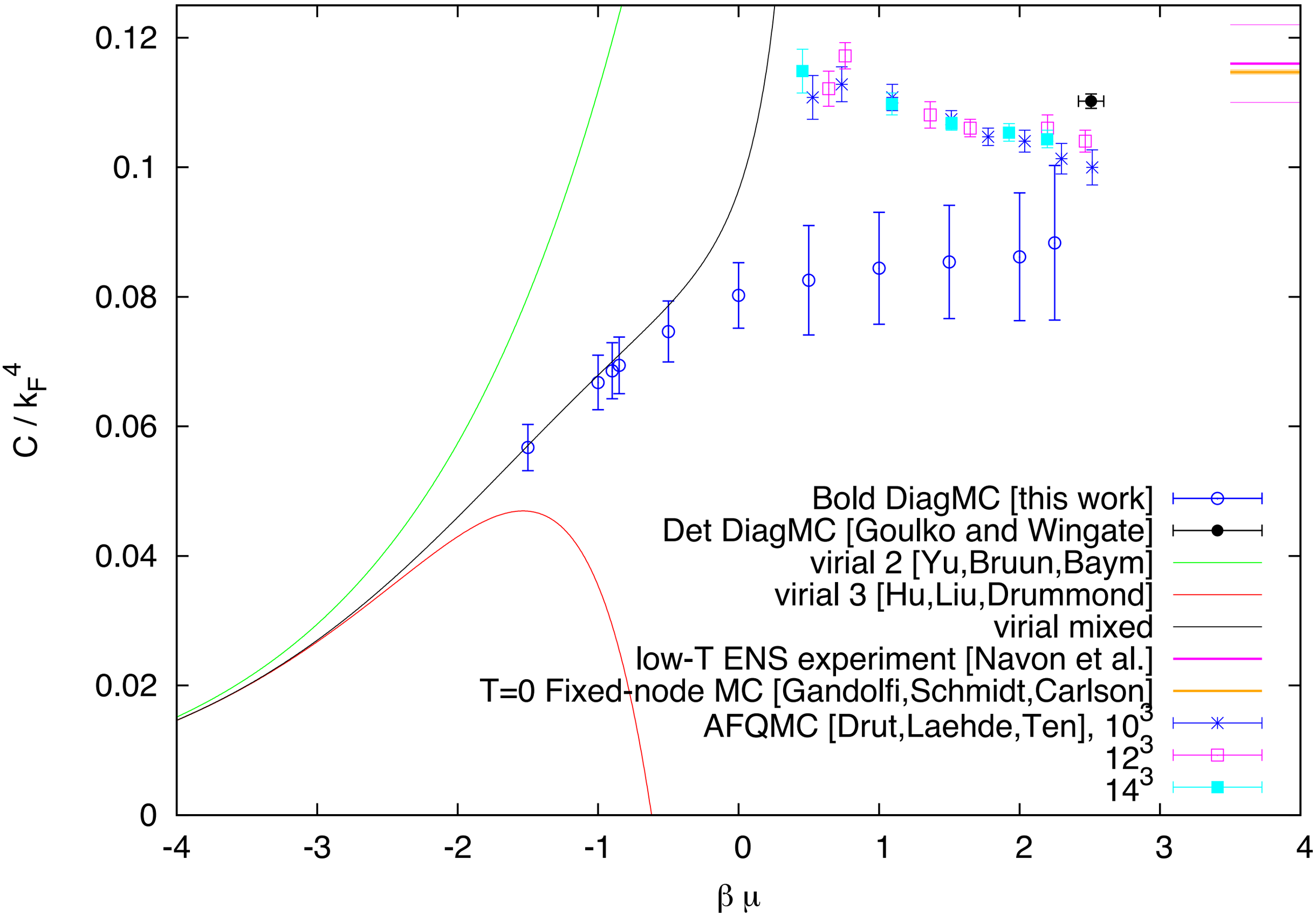
EQUATION OF STATE: DENSITY



EQUATION OF STATE: PRESSURE



CONTACT


C / k_F^4
0.12
0.1
0.08
0.06
0.04
0.02
0
-4
-3
-2
-1
0
1
2
3
4
β μ
Bold DiagMC [this work]
Det DiagMC [Goulko and Wingate]
virial 2 [Yu,Bruun,Baym]
virial 3 [Hu,Liu,Drummond]
virial mixed
low-T ENS experiment [Navon et al.]
T=0 Fixed-node MC [Gandolfi,Schmidt,Carlson]
AFQMC [Drut,Laehde,Ten], 10^3
12^3
14^3