Quark, gluon and ghost propagator in large-N_f Landau gauge QCD

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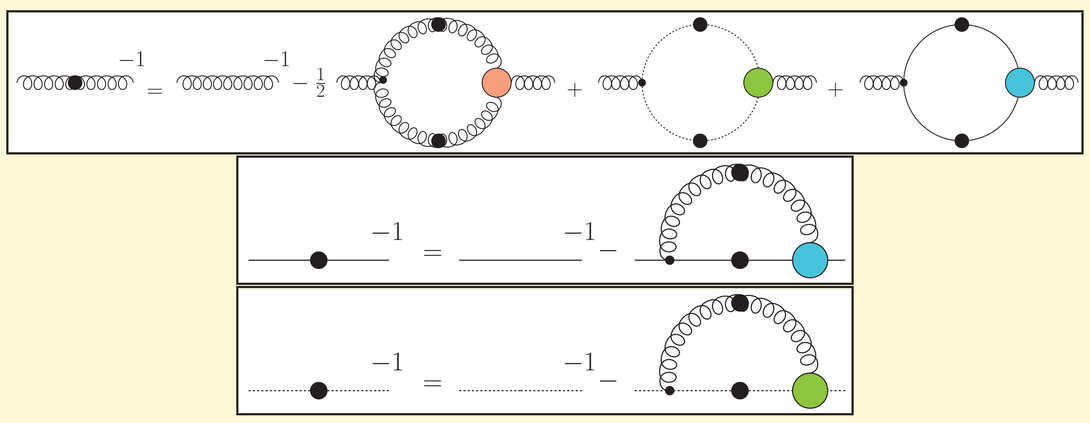
Dyson-Schwinger equations (DSEs)

- Coupled set of nonlinear integral equations for non-perturbative Green's functions
- For a given Green's function the equations involve higher order Green's functions
- Infinite tower $\rightarrow$ truncation required
- Solve truncated equations selfconsistently
- Vertex Green's function may have complicated tensor structures $\rightarrow$ models employed

Truncated DSEs for QCD propagators



- Dressed propagators are denoted by black blobs, dressed vertices by colored blobs
- Gluon DSE: tadpole and four-gluon diagrams are neglected
- Use a bare ghost-gluon vertex and models for quark-gluon and three-gluon vertex

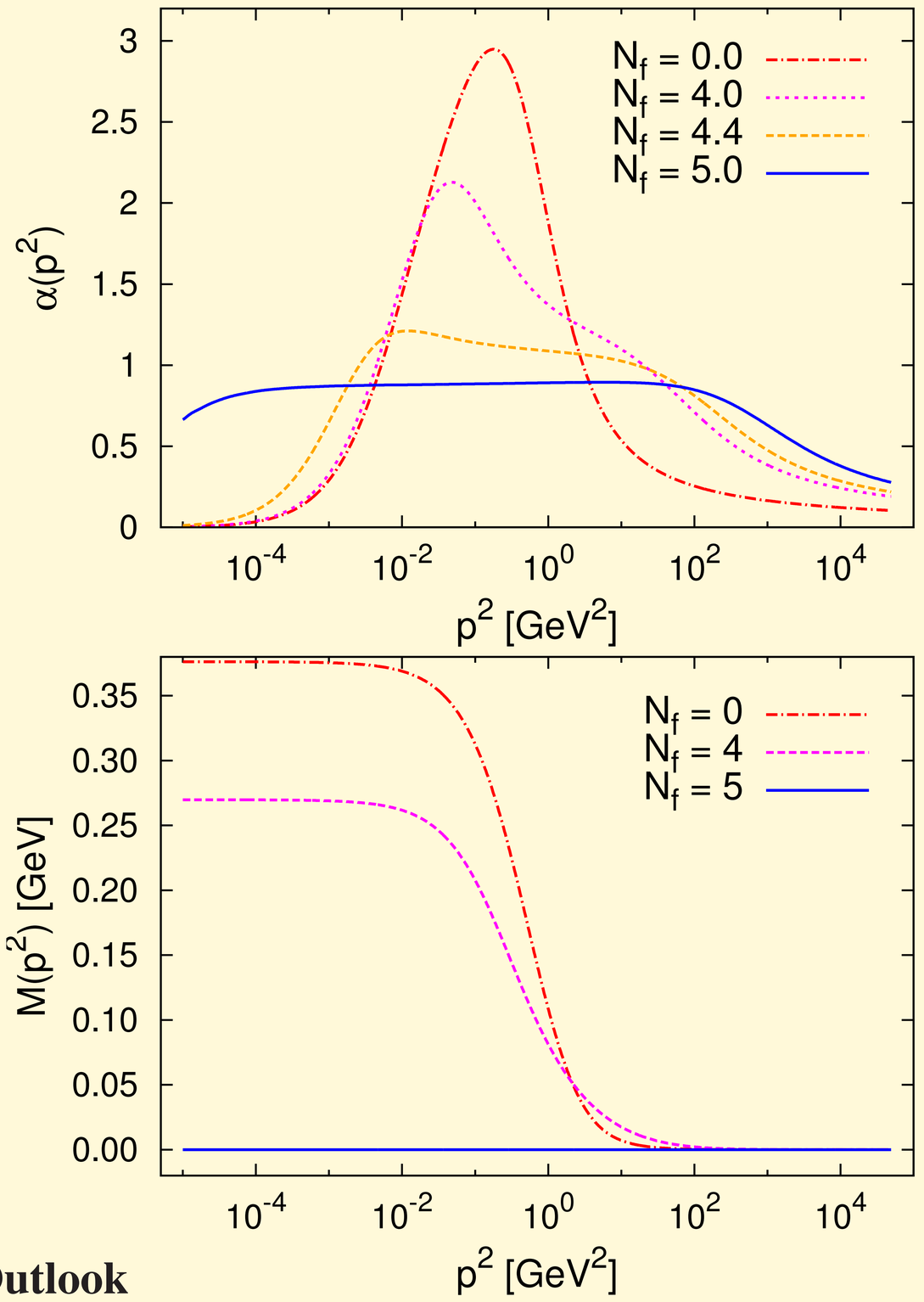
Large N_f QCD

- Include N_f fundamentally charged quarks with vanishing bare mass
- At some N_f^{crit} a phase transition into a chirally symmetric phase with walking coupling is expected
- Of interest for thermal QCD (phase transition) and technicolor theories (walking coupling)
- Multiple results on the lattice available, a previous study using DSEs exists. [1]

Numerics

- Different iterative methods for selfconsistently solving DSEs available
- For details regarding the numerical solution see for instance ref. [2]

Previous results [1] and outlook



Outlook

- Include ghost-gluon vertex selfconsistently
- Investigate influence of different three-gluon and quark-gluon vertex models on N_f^{crit}

References and acknowledgement

[1]M.Hopfer, C.S.Fischer, R.Alkofer, JHEP 1411(2014)035
[2]M.Q. Huber, arXiv:1808.05227

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