Renormalization group improved pressure for cold and dense quark matter

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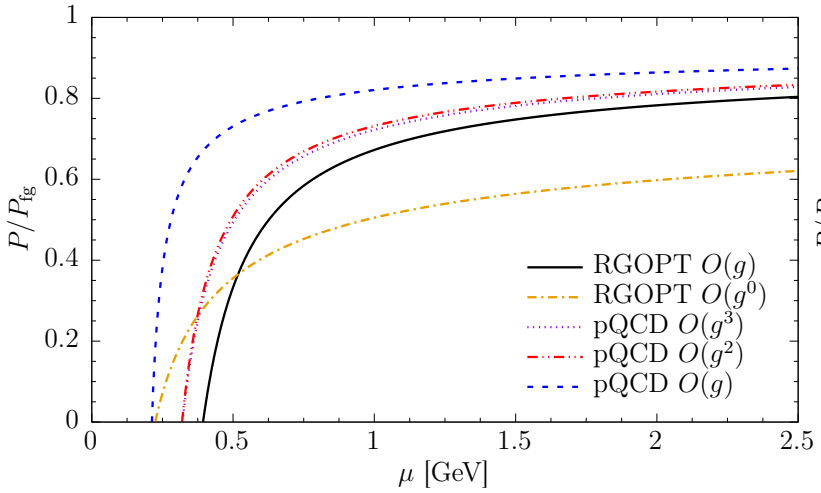
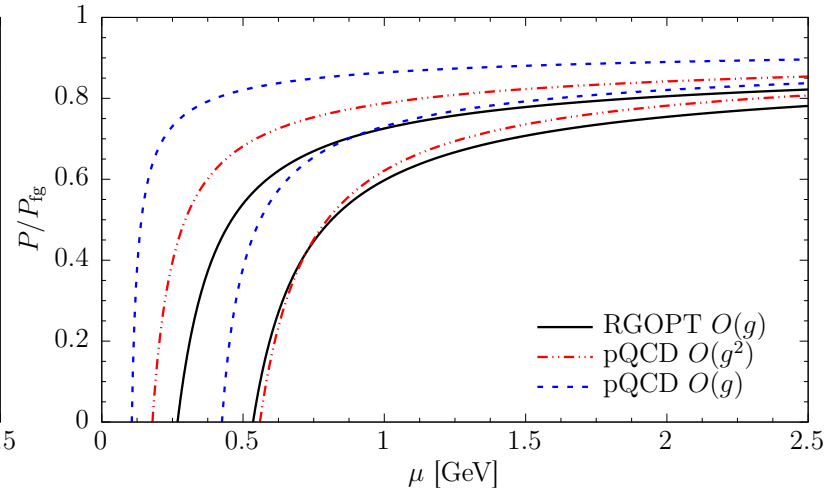
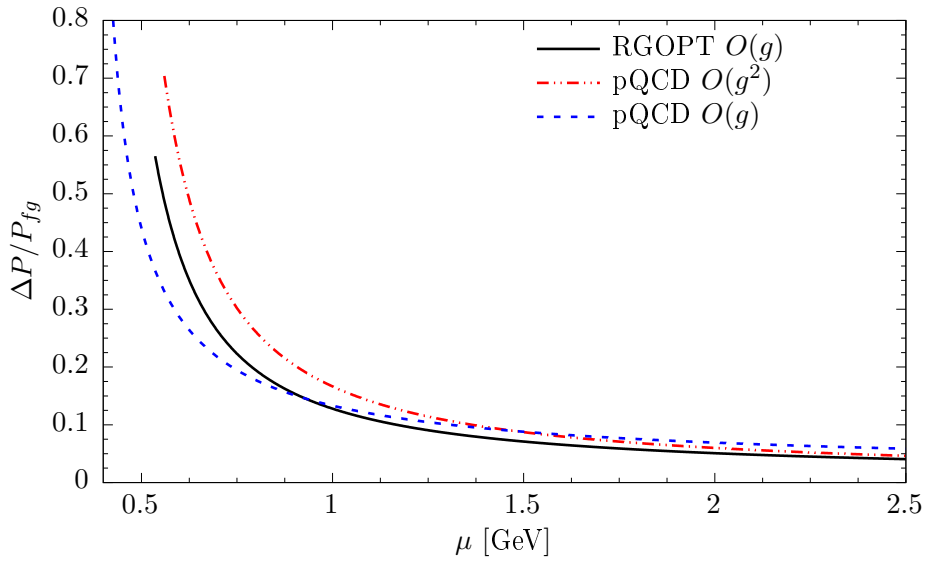
RGOPT

- In this work, we apply the renormalization group optimized perturbation theory (RGOPT) to evaluate the QCD pressure at the two-loop level, considering masseless quarks in a dense and cold medium.
- This non-perturbative approximation considers renormalization group properties in order to reduce the renormalization scale dependence.
- At leading order (α_s^0) the RGOPT provides a nontrivial non-perturbative result which is completely scale invariant.
- At the next leading order (α_s) The RGOPT provides results that are less sensitive to variations in the arbitrary $\overline{\text{MS}}$ renormalization scale than those obtained with pQCD.


$P/P_{\rm fg}$
μ [GeV]
RGOPT $O(g)$
RGOPT $O(g^0)$
pQCD $O(g^3)$
pQCD $O(g^2)$
pQCD $O(g)$


$P/P_{\rm fg}$
μ [GeV]
RGOPT $O(g)$
pQCD $O(g^2)$
pQCD $O(g)$


$\Delta P/P_{fg}$
μ [GeV]
RGOPT $O(g)$
pQCD $O(g^2)$
pQCD $O(g)$

More details in the poster section!

Thank you !