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# Some applications of Renormalization Group Optimized perturbation at zero and finite temperature (45+15)

*jeudi 9 novembre 2017 10:00 (1 heure)*

I will illustrate how the recently developed renormalization group optimized perturbation theory (RGOPT) resums perturbative expansions in vacuum or thermal field theories. For zero temperature QCD typically, it gives realistic approximations of the order parameters of chiral symmetry breaking (quark condensate etc). In thermal theories the convergence and scale dependence of RGOPT thermodynamical quantities are drastically improved as compared to standard perturbative expansions, and it cures the odd drastic scale dependence observed in other related methods such as the screened perturbation or (resummed) hard-thermal-loop (HTL) perturbation. I will present some recent results in scalar models, and first applications to HTL resummation for QCD thermodynamical quantities, also explaining the additionnal calculations needed in gauge theories with respect to standard HTLpt within our framework.

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