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Chiral phase transition with fluctuation and finite coupling effects at strong coupling TERUKAZU ICHIHARA, Dept. Phys. and YITP, Kyoto U., AKIRA OHNISHI, YITP, Kyoto U. — We investigate chiral phase transition including both fluctuation and finite coupling effects on QCD phase diagram in the strong coupling lattice QCD (SC-LQCD). The effective action is obtained in terms of hadronic degrees of freedom in SC-LQCD after analytic integration over link variables followed by Grassmann variables, and we expect weaker sign problem at finite density. Recently, we have evaluated fluctuation effects in the strong coupling limit in the auxiliary field Monte-Carlo (AFMC) method [1]. We found fluctuation effects modify the chiral phase transition boundary, as suggested by the monomer-dimer-polymer simulation [2]. Finite coupling effect [3] is another important ingredient to obtain insight into continuum QCD phase diagram. In the presentation, we give a brief explanation on how to include both fluctuation and finite coupling effects via sequential bosonization procedure in AFMC, and show what kind of plaquette configuration modifies the behavior of the chiral condensate. We also discuss the sign problem in AFMC and a probable way to weaken the sign problem.

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[2] W. Unger, P. de Forcrand, J. Phys. G38 (2011) 124190.

[3] K. Miura, T. Z. Nakano, A. Ohnishi and N. Kawamoto, Phys. Rev. D 80, 074034 (2009)

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