Self-learning Monte-Carlo for non-abelian gauge theory with dynamical fermions[1] AKIO TOMIYA, RIKEN, YUKI NAGAI, JAEA, AKINORI TANAKA, RIKEN — In this talk, we introduce the self-learning Monte-Carlo (SLMC) algorithm for non-abelian gauge theory with dynamical fermions in four dimensions to resolve the autocorrelation problem in lattice QCD. We performed simulations with the dynamical staggered fermions and plaquette gauge action by both in HMC and SLMC for zero and finite temperature to examine the validity of SLMC. We confirmed that SLMC can reduce autocorrelation time in non-abelian gauge theory and reproduces results from HMC. For finite temperature runs, we confirmed that SLMC reproduces correct results with HMC, including higher-order moments of the Polyakov loop and the chiral condensate. Besides, our finite temperature calculations indicate that four flavor QC_2D with $\hat{m} = 0.5$ is likely in the crossover regime in the Colombia plot. This talk is based on arXiv 2010.11900.

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