

2+1 Flavor Lattice QCD with Lüscher's Domain-Decomposed HMC Algorithm

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Abstract: We report on a study of 2+1 flavor lattice QCD with the $O(a)$ -improved Wilson quarks on $16^3 \times 32$ lattice at the lattice spacing $1/a \approx 2\text{GeV}$ employing Lüscher's domain-decomposed HMC(LDDHMC) algorithm. This is dedicated to a preliminary study for PACS-CS project which plans to complete the Wilson-clover $N_f = 2 + 1$ program lowering the up-down quark masses close to the physical values. We focus on three issues: (i) how light quark masses we can reach with LDDHMC, (ii) efficiency of the algorithm compared with the conventional HMC, (iii) CPU-time estimate for productive runs on PACS-CS. The physics plans with PACS-CS are also discussed.