Search for critical point in $\mu \neq 0$ density QCD with many flavor approach

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In collaborete with

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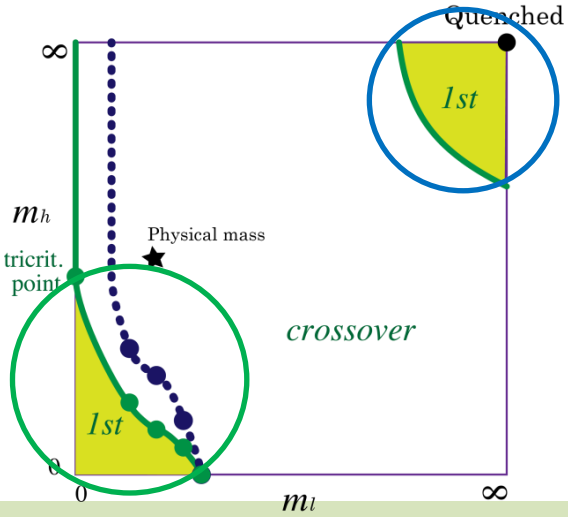
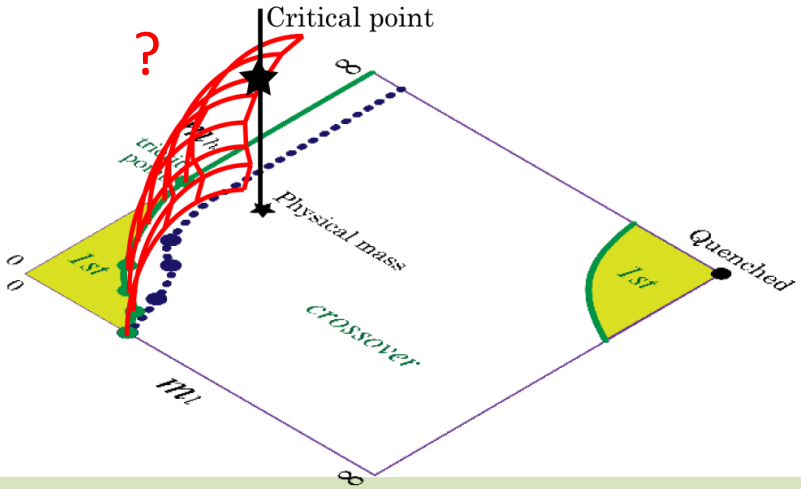
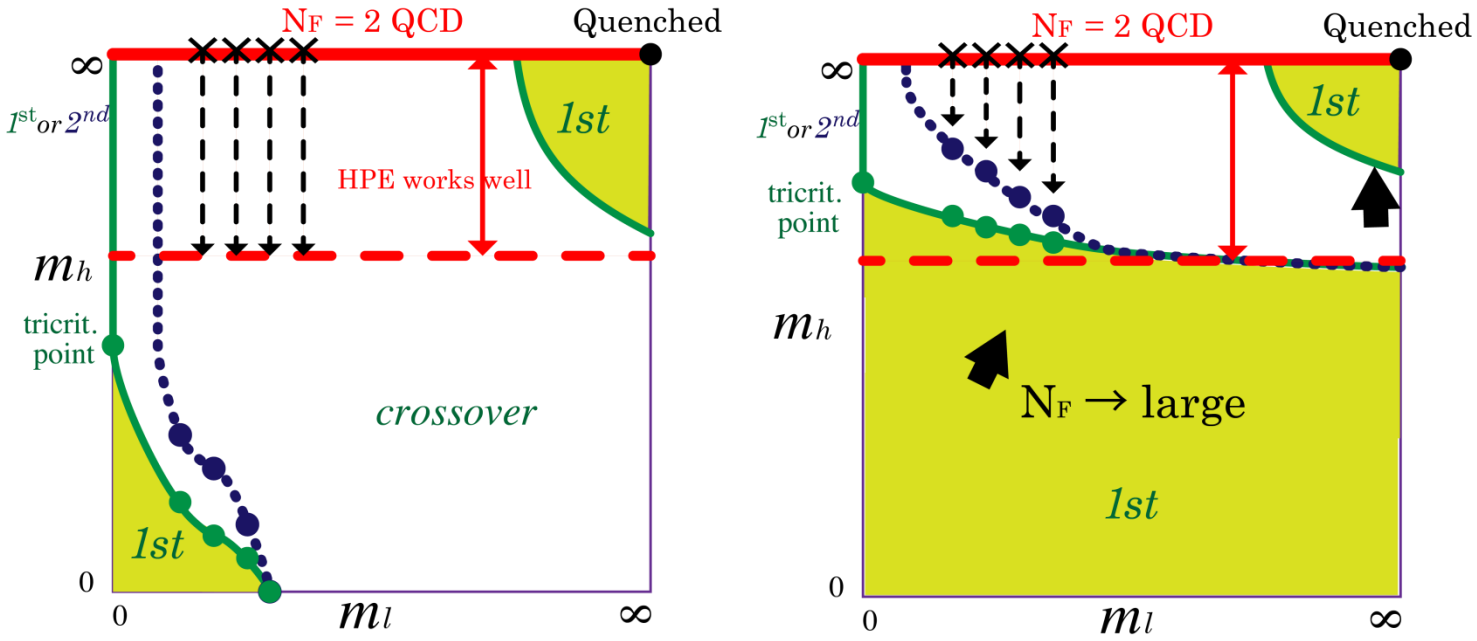
Research of μ≠0 QCD phase structure w/ LQCD

- Columbia plot
  - Quark mass (m_{ud},m_s) dep. of the order of chiral PT
  - the order is crossover @ Physical mass : m_{ud}≃1MeV、m_s≃100MeV @ μ=0
  - There are the regions of 1st PT in light and heavy quark mass region @ μ=0
- μ dependence of the boundary of 1st PT
  - If the boundary spreads out as increasing μ,
    we can find the QCD critical point in low μ region





Many flavour approach



- We study the system where 2 light quarks and N_f heavy quarks exist.
- It is known that 1st order region is wider as increasing N_f

S. Ejiri, N. Yamada, Phys. Rev. Lett. 110, 172001 (2013)

1. For large N_f, we can search the boundary of 1st PT.
2. For large N_f, we can determine critical point where the 1st order transition terminated relatively easily.

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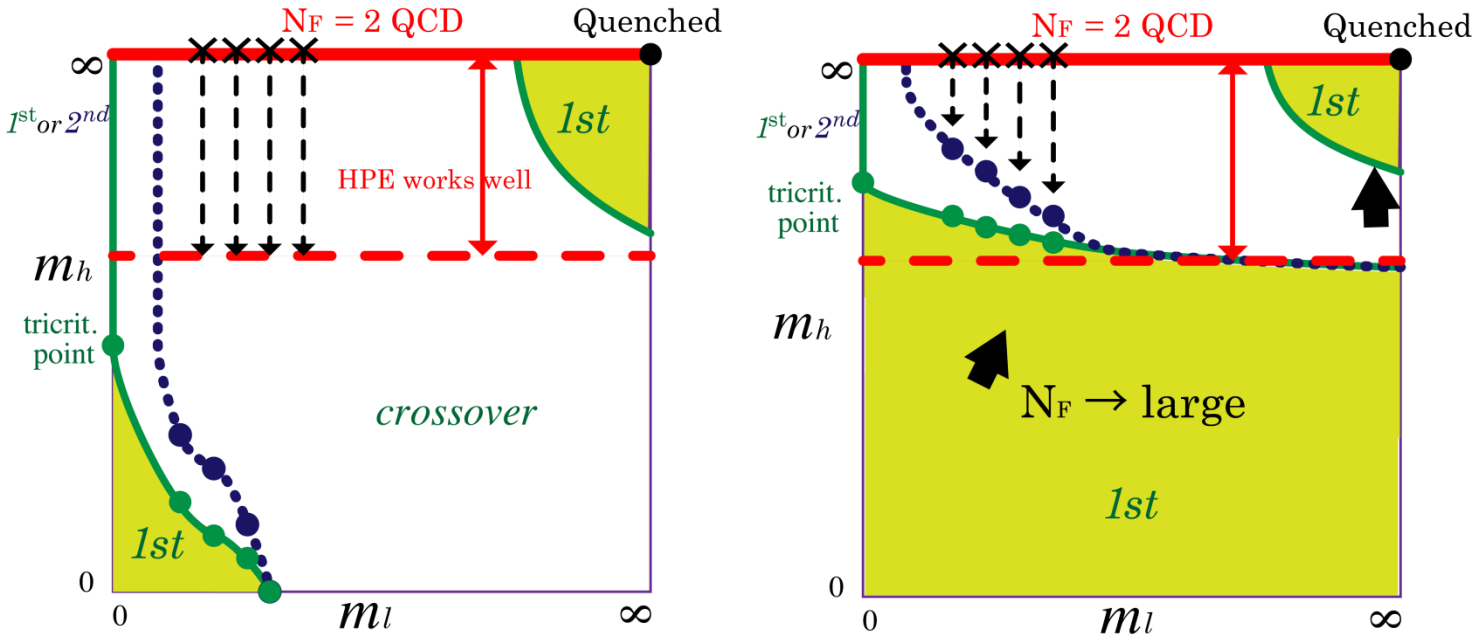

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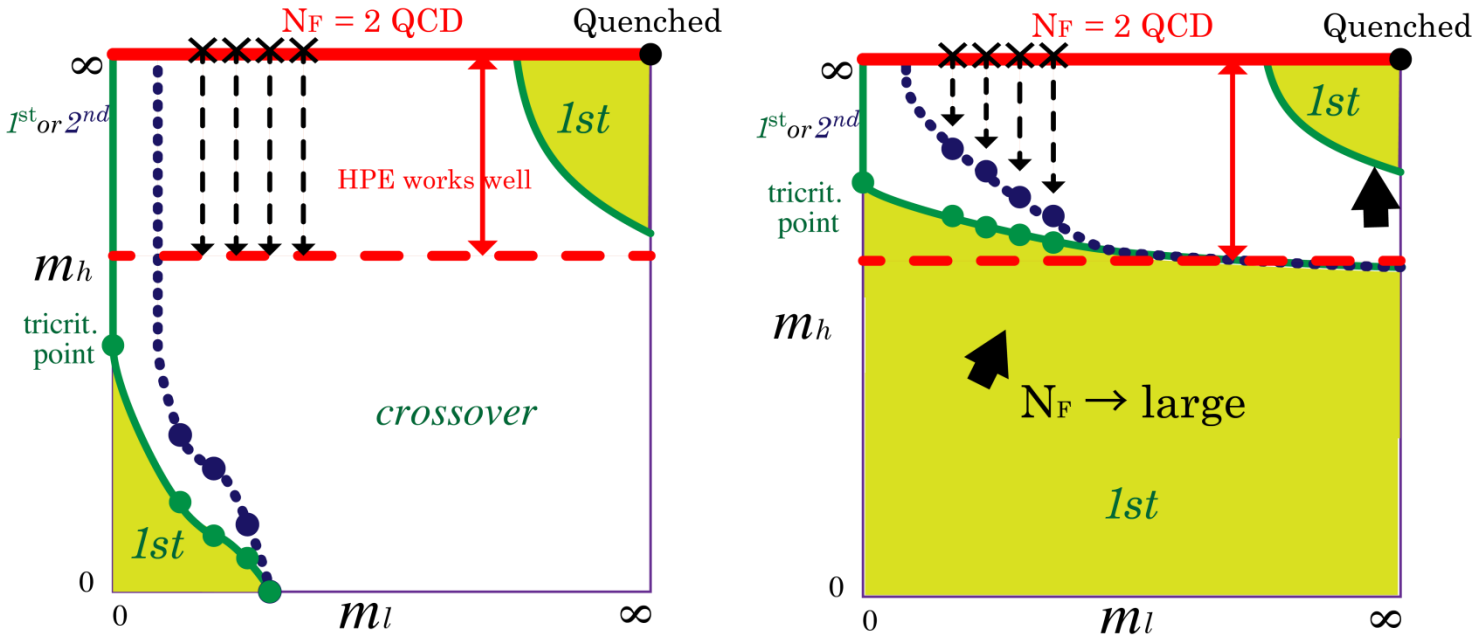

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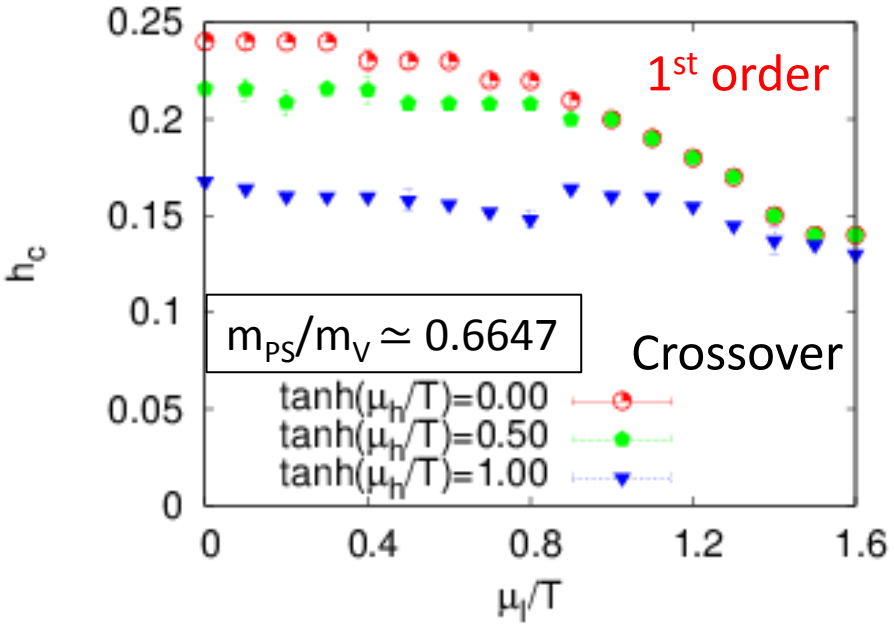

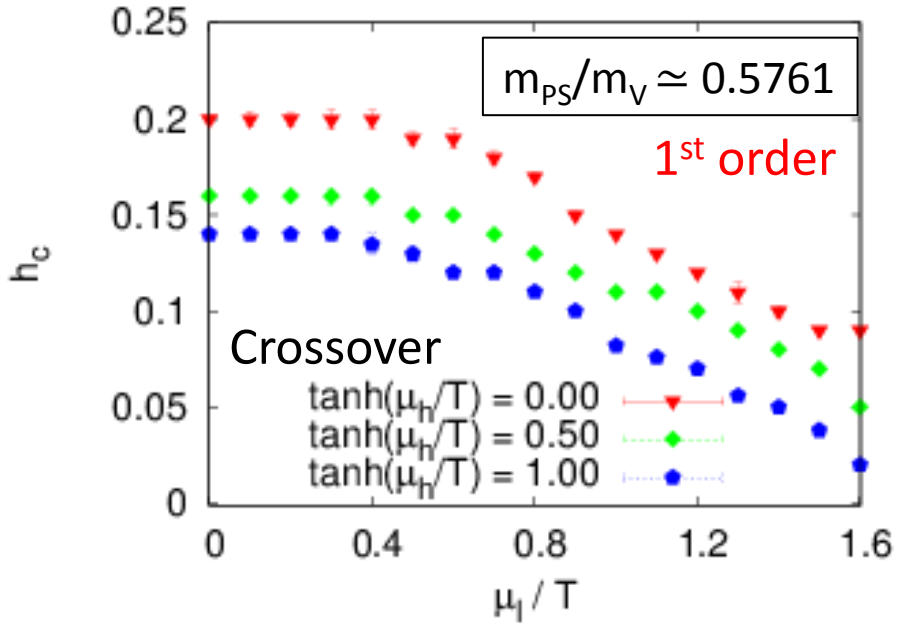

1. 1st order region becomes wider as increasing (μ_l/T, μ_h/T)
2. Especially, 1st order region is wider rapidly at large μ_h/T
3. In high heavy quark density region ($\mu_h/T > 5.0$),
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I'll talk about more details in my poster presentation.
Please come and listen to my presentation!!

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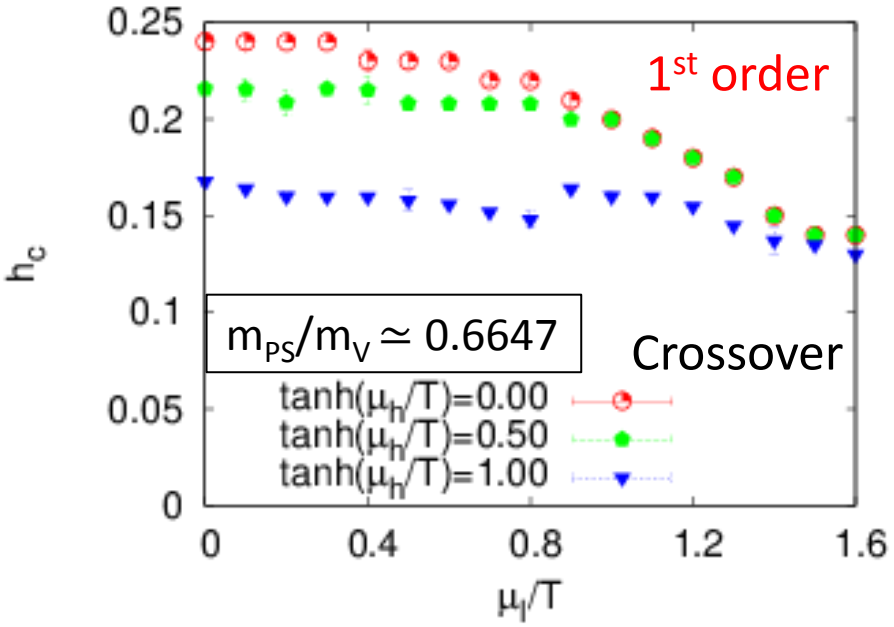

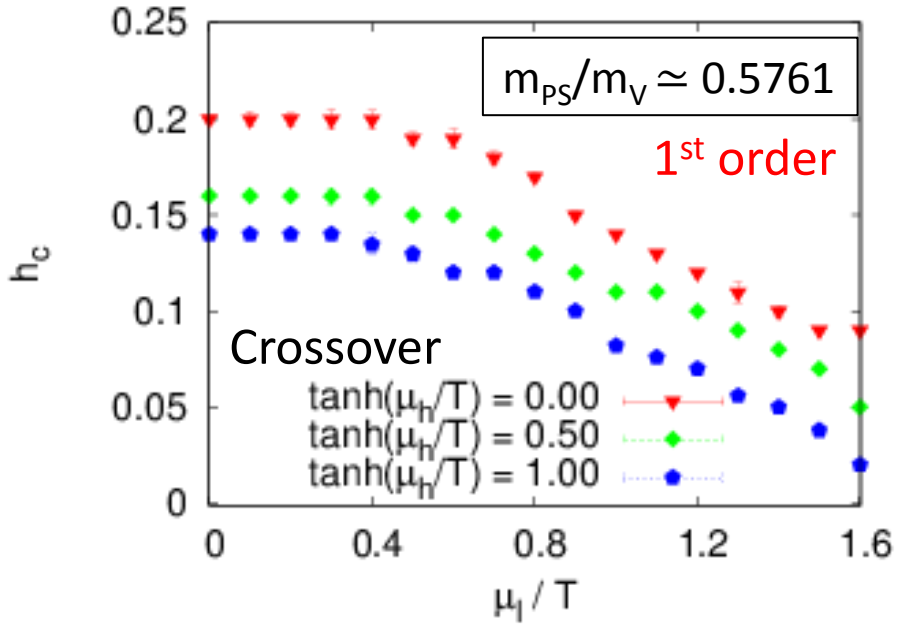

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