Trial of
a BayesOpt library written in JuliaLang
`BayesianOptmization.jl`

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BayesOpt libs in JuliaLang

- COMBO (BayesOpt lib written in Python) requires discretization of input parameters
  - So, I search for other BO libs
- Since I prefer JuliaLang to Python, I search for BayesOpt libs written in Julia.
  - https://julialang.org
  - Julian BO libs I found
    - `BayesianOptimization.jl`
      - https://github.com/jbrea/BayesianOptimization.jl
      - pure Julia lib
    - `BayesOpt.jl`
      - https://github.com/jbrea/BayesOpt.jl
      - Julia wrapper of BayesOpt, written in C++

Search for the peak of the Binder ratio

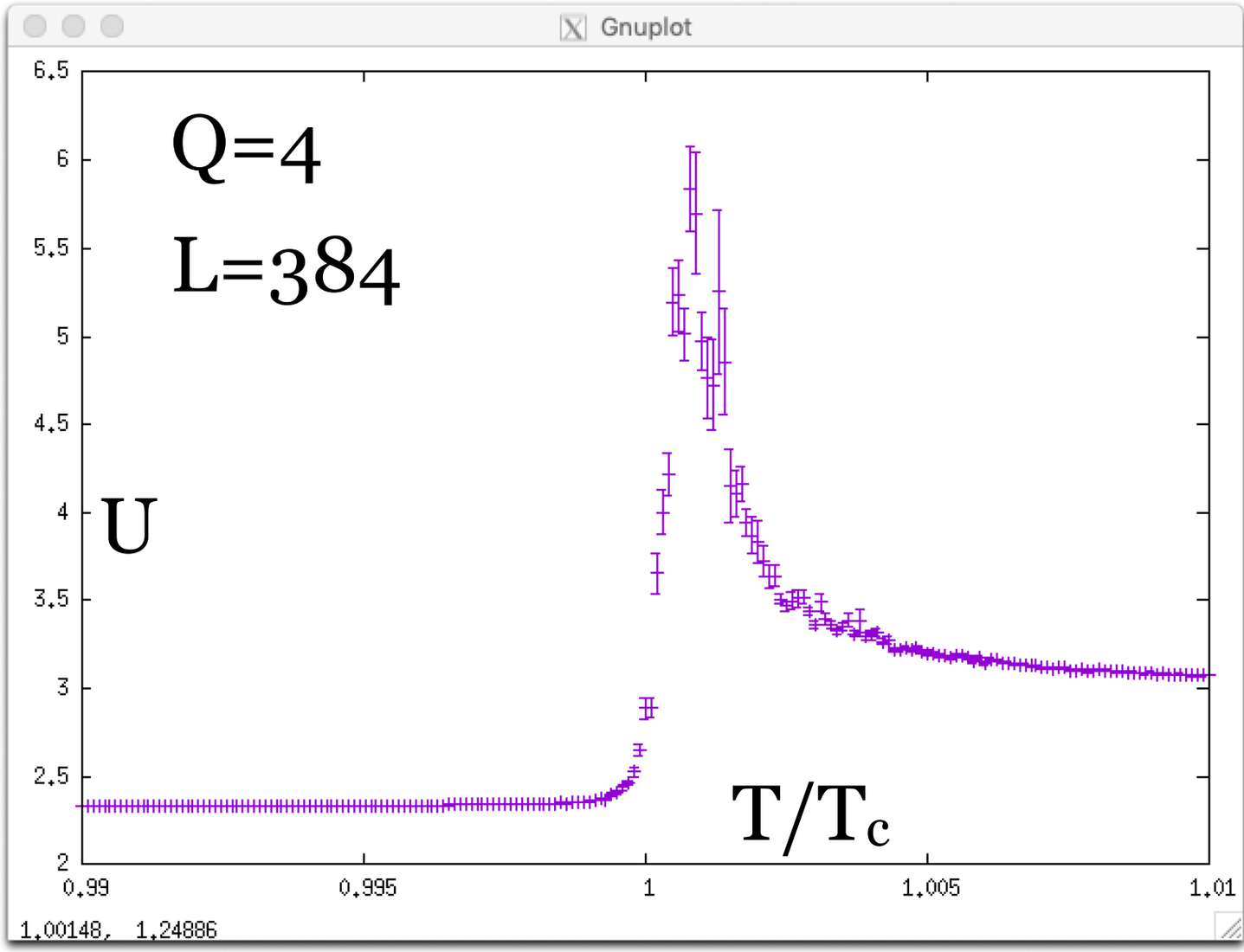
Potts model

$$E(\{\sigma\}) = -\sum_{\langle ij \rangle} \delta(\sigma_i, \sigma_j)$$

$$\sigma = 1, 2, \ldots, Q$$

Binder ratio

$$U = \frac{\langle m^4 \rangle}{\langle m^2 \rangle^2}$$



- Q = 4 Potts model has the Binder ratio with a sharp peak (see Fig.)
- I want to search for the location and the height of the peak
  - Use the Bayesian optimization method!

Preliminary Result

- I adopt `SpinMonteCarlo.jl` for MCMC calculation
  - https://github.com/yomichi/SpinMonteCarlo.jl

- L = 64
- T/Tc <- [0.9, 1.1]
  - Discretization is NOT required!

- Comment/Impression
  - BO.jl has few document… x(