MuCa vs WL: A tight race

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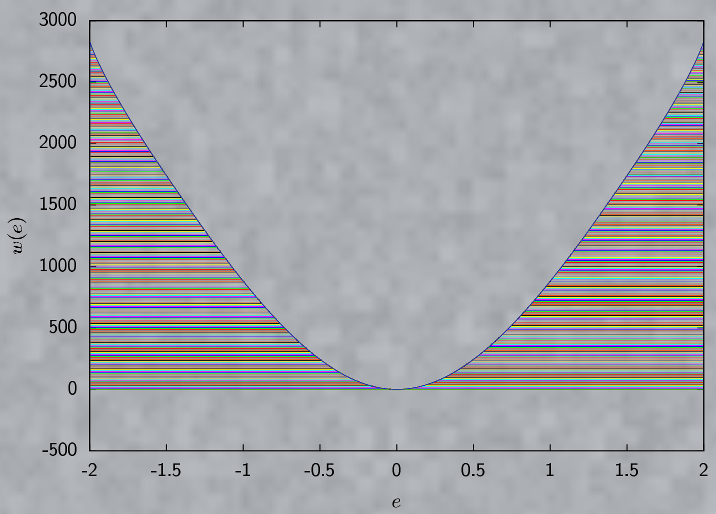
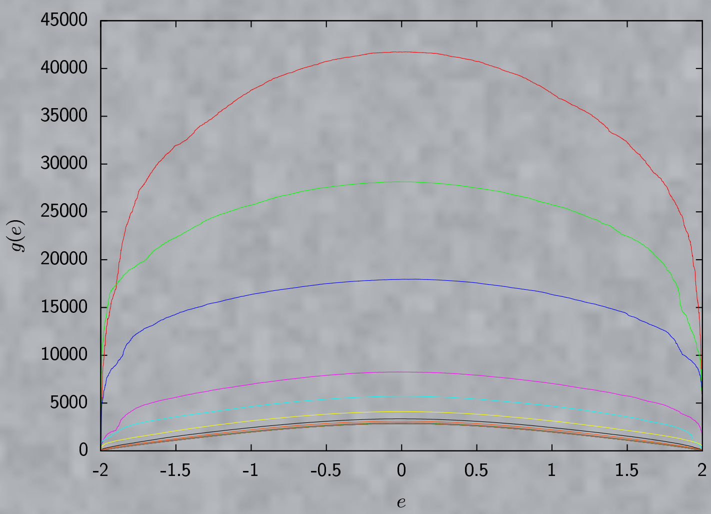




Goal:

- a fair comparison of the two methods
- easy to reproduce
- no tricks and optimizations, just standard procedures
- use a simple model to play with (2d Ising model)

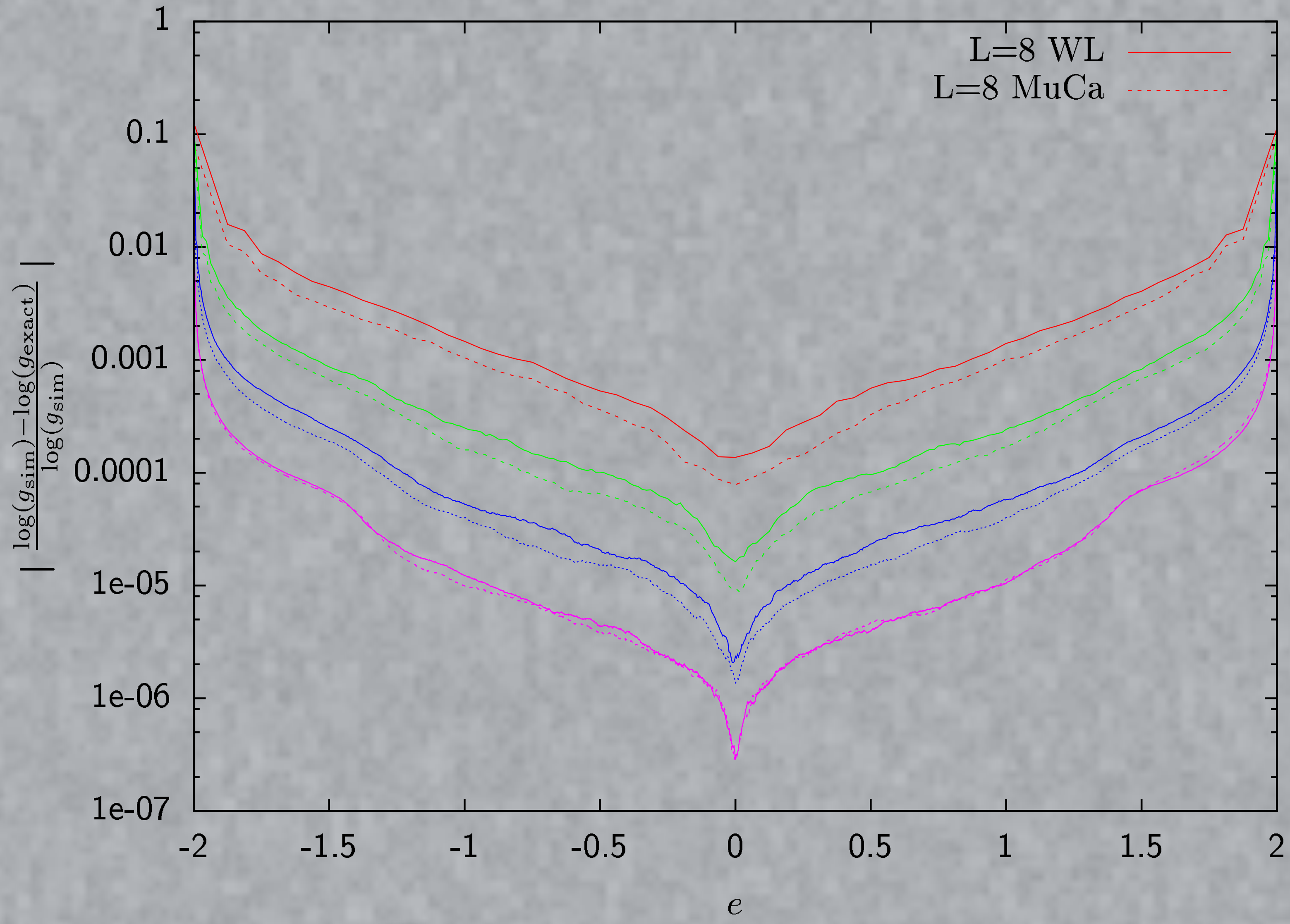
Wang Landau

- choose a set of energy ranges and set the density of states $g(E)$ to one in each
- start random walk in energy space, and each time an energy level is visited, update the corresponding density of states by multiplying the existing value by a modification factor $f > 1$
- do the random walk until the accumulated histogram of energy is flat (80%)
- reset the histogram and reduce the modification factor to continue and converge the $g(E)$

MuCa

- replace canonical Boltzmann distribution by
$$P_{\mathrm{muca}}(\phi) \propto \exp(-\beta H(\phi) - f(\{Q_i(\phi)\}))$$
with
$$W(\{Q_i\}) \equiv f(\{Q_i\}))$$
- recursive construction of the weights W
(use recursion, in which the new weight factor is computed from all available data accumulated so far)
- production run with fixed weights
- reweighing to extract the desired canonical quantities

Berg, Neuhaus



Summary

MuCa vs WL: it is a tight race!
with lots of parameters to play with

- run WL with 80% flat criterium, also for the production run

- run MuCa, with fixed numbers of sweeps per iteration, until the full energy range is covered

- use the „rest“ of the computer time for the measurement run

- Suggestions:

- Comments: