Brendan Philbin
Ising Model Minimum Energy

Import relevant files and define plots

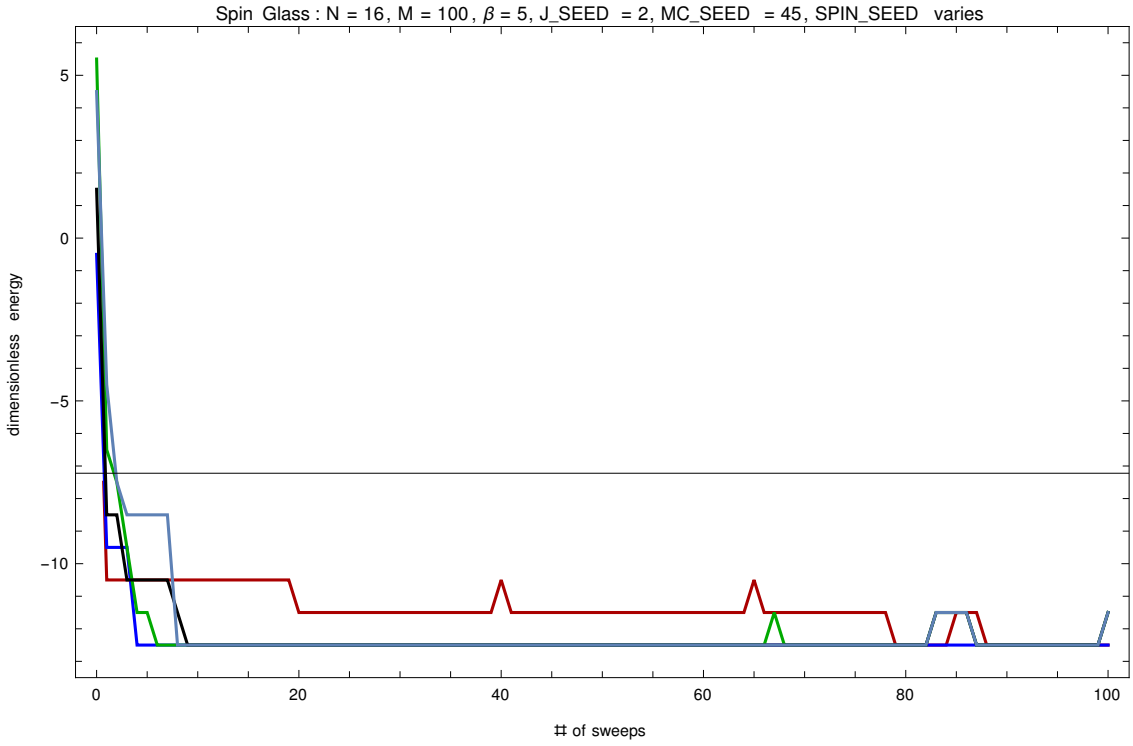
In[99]:=
```
Clear["Global`*"];
SetDirectory[NotebookDirectory[]];
numSweeps = Range[0, 100];
colors = {Darker[Red], Blue, Darker[Green], Black, Orange};
trials = Range[1, 50];
plots = Range[1, 50];
For[i = 1, i ≤ 50, i++,
  Evaluate[Symbol["rawTrial" <> ToString[i]]] =
   Flatten[Import["min_energy_output" <> ToString[i] <> ".csv", "CSV"]];
  Evaluate[Symbol["trial" <> ToString[i]]] =
   Transpose[{numSweeps, Evaluate[Symbol["rawTrial" <> ToString[i]]]}];
  trials[[i]] = Evaluate[Symbol["trial" <> ToString[i]]];
  Evaluate[Symbol["plot" <> ToString[i]]] =
   ListLinePlot[trials[[i]], PlotStyle → colors[[Mod[i, 5]]]];
  plots[[i]] = Evaluate[Symbol["plot" <> ToString[i]]];
 ];
```

Create 10 plots grouping 5 trials with same J_SEED

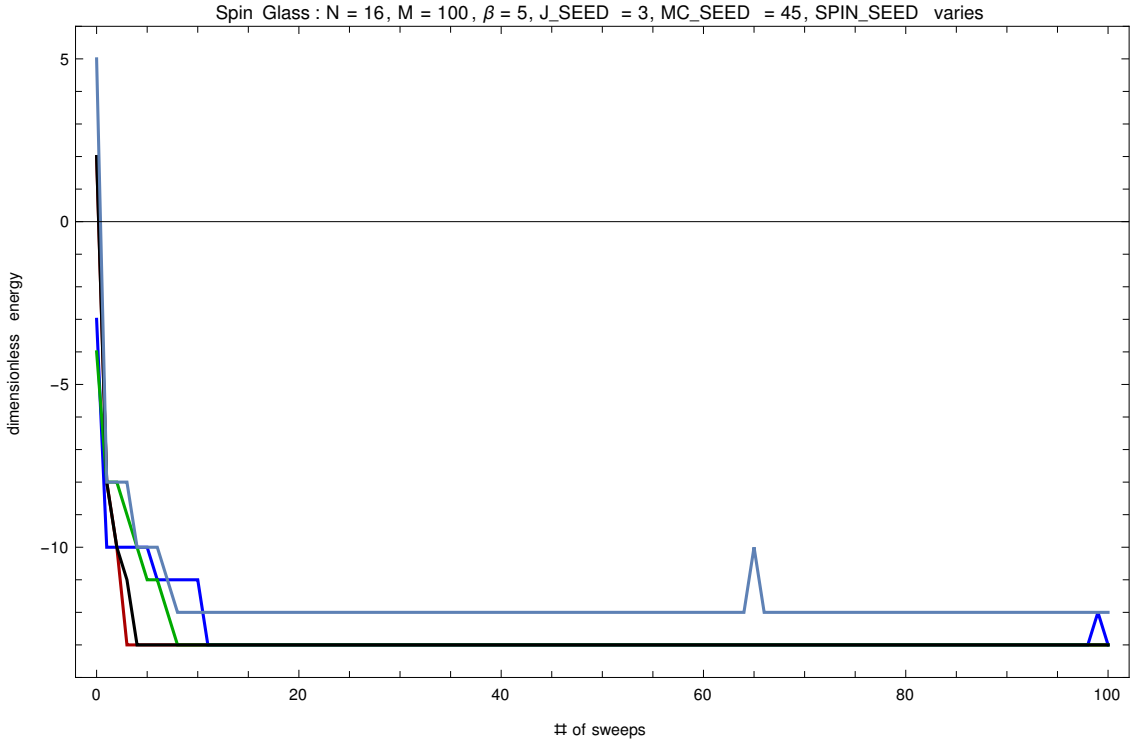
In[126]:=
```
Show[plots[[1]], plots[[2]], plots[[3]], plots[[4]], plots[[5]], Frame → True, FrameStyle → Black,
 LabelStyle → Black, FrameLabel → {"# of sweeps", "dimensionless energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 16, M
    = 100, β = 5, J_SEED = 2, MC_SEED = 45, SPIN_SEED varies"]

Show[plots[[6]], plots[[7]], plots[[8]], plots[[9]], plots[[10]], Frame → True, FrameStyle → Black,
 LabelStyle → Black, FrameLabel → {"# of sweeps", "dimensionless energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 16, M
    = 100, β = 5, J_SEED = 3, MC_SEED = 45, SPIN_SEED varies"]

Show[plots[[11]], plots[[12]], plots[[13]], plots[[14]],
 plots[[15]], Frame → True, FrameStyle → Black, LabelStyle → Black,
```

```
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 16, M
    = 100, β = 5, J_SEED = 4, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦16⟧, plots⟦17⟧, plots⟦18⟧, plots⟦19⟧,
 plots⟦10⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 16, M
    = 100, β = 5, J_SEED = 5, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦21⟧, plots⟦22⟧, plots⟦23⟧, plots⟦24⟧,
 plots⟦25⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 16, M
    = 100, β = 5, J_SEED = 6, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦26⟧, plots⟦27⟧, plots⟦28⟧, plots⟦29⟧,
 plots⟦30⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 32, M
    = 100, β = 5, J_SEED = 2, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦31⟧, plots⟦32⟧, plots⟦33⟧, plots⟦34⟧,
 plots⟦35⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 32, M
    = 100, β = 5, J_SEED = 3, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦36⟧, plots⟦37⟧, plots⟦38⟧, plots⟦39⟧,
 plots⟦40⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 32, M
    = 100, β = 5, J_SEED = 4, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦41⟧, plots⟦42⟧, plots⟦43⟧, plots⟦44⟧,
 plots⟦45⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"},
 PlotRange → All, PlotLabel → "Spin Glass: N = 32, M
    = 100, β = 5, J_SEED = 5, MC_SEED = 45, SPIN_SEED  varies"]

Show[plots⟦46⟧, plots⟦47⟧, plots⟦48⟧, plots⟦49⟧,
 plots⟦50⟧, Frame → True, FrameStyle → Black, LabelStyle → Black,
 FrameLabel → {"# of sweeps", "dimensionless  energy"}, PlotRange → All, PlotLabel →
```

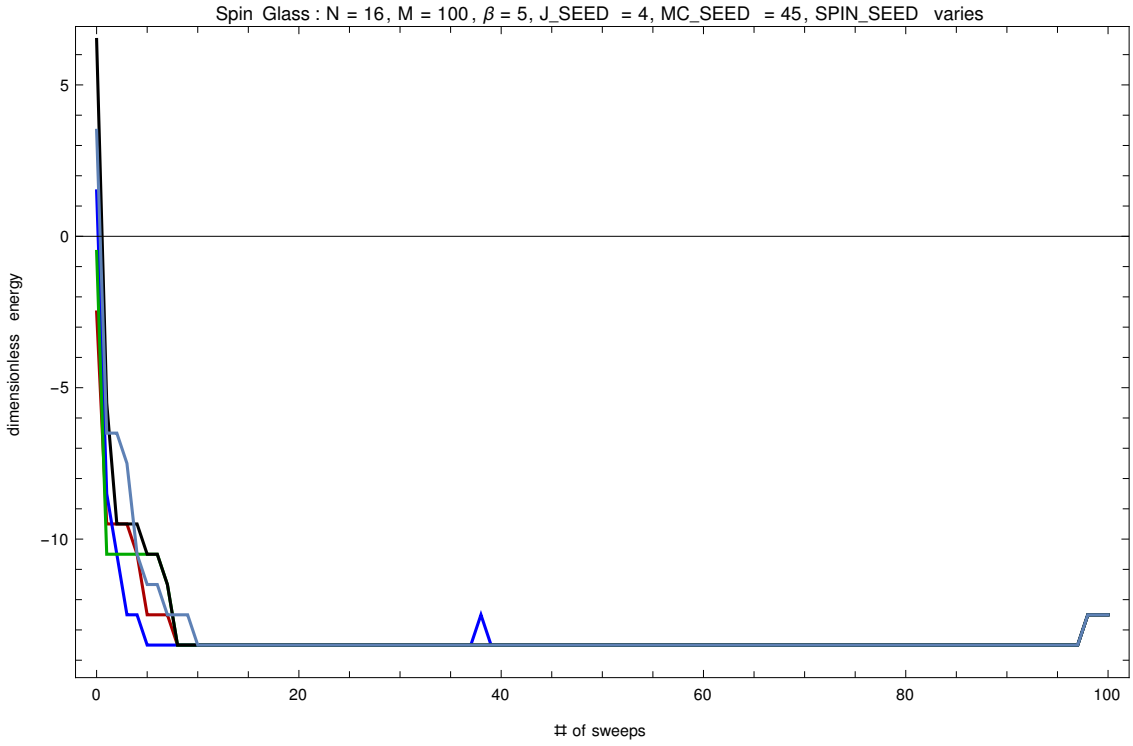
Out[126]=



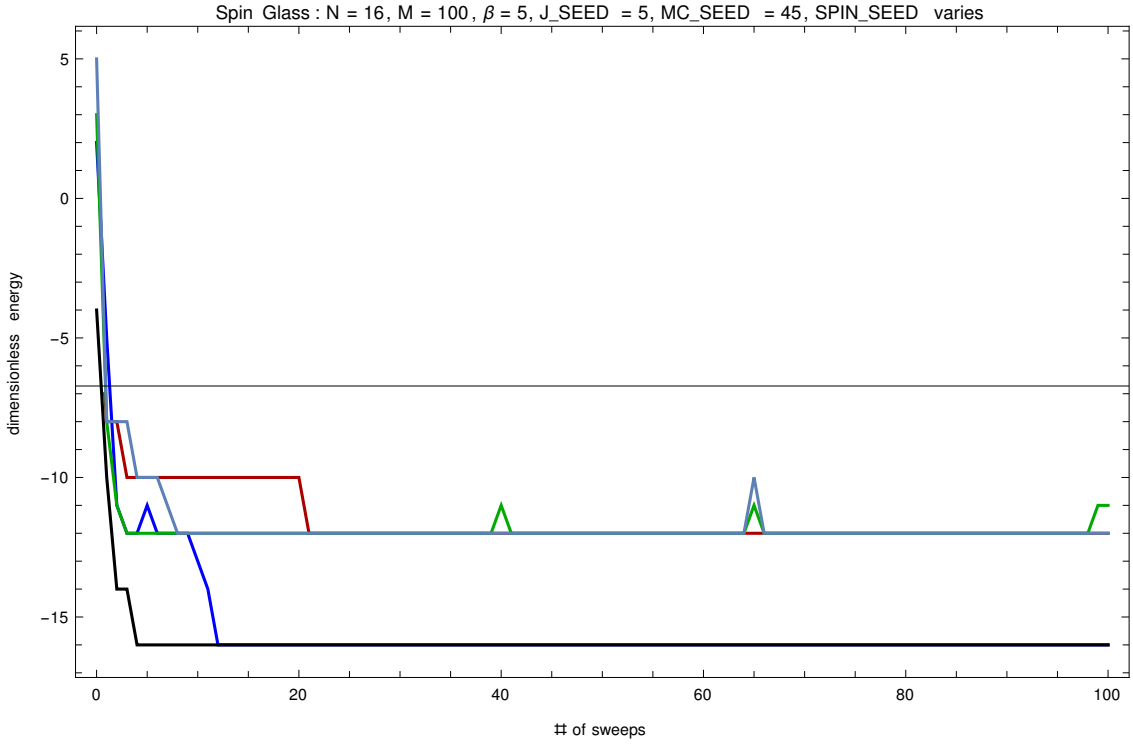
Out[127]=



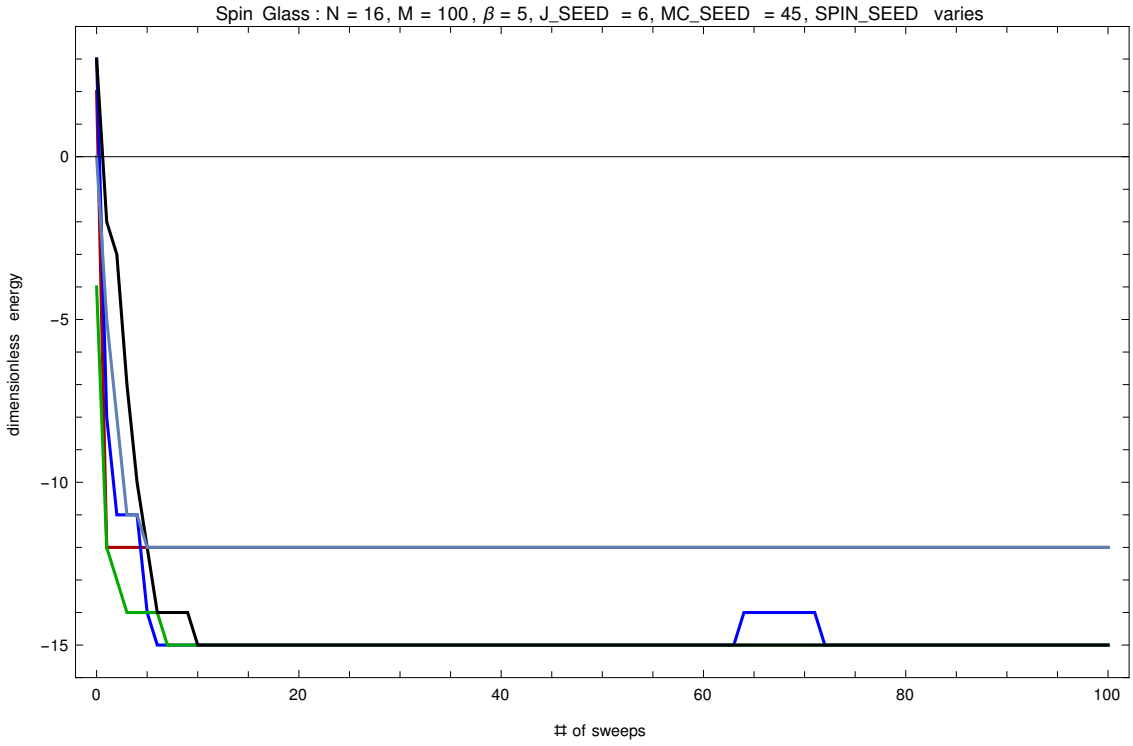
Out[128]=



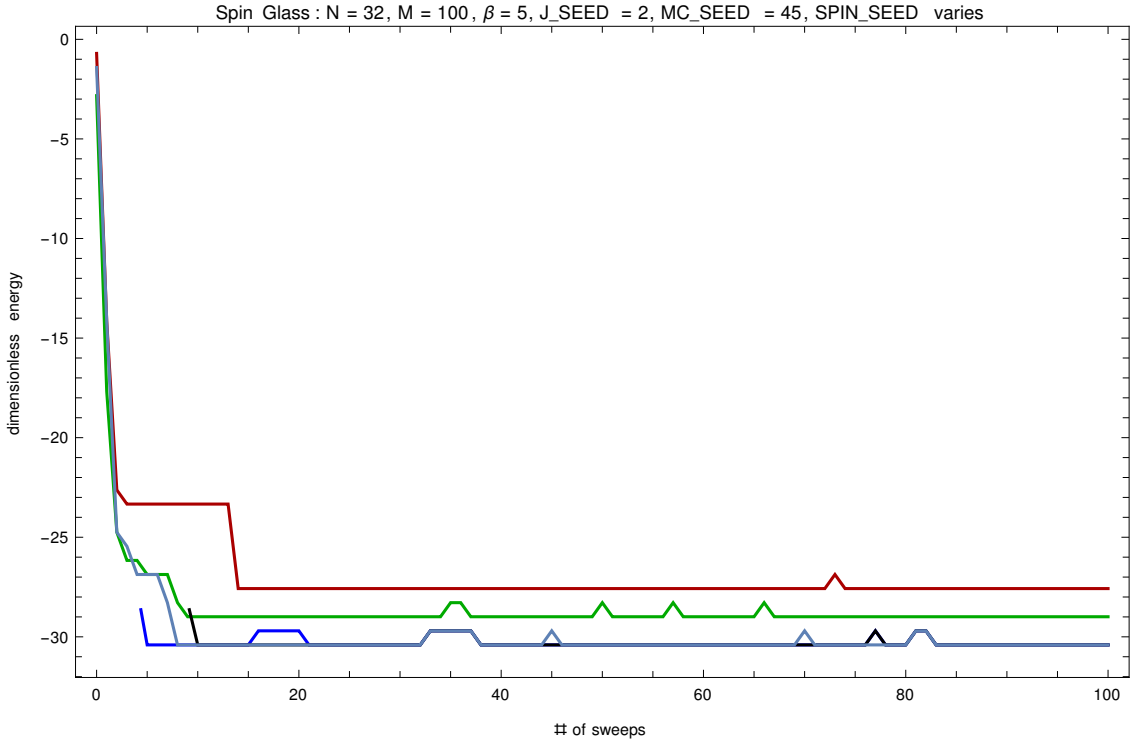
Out[129]=



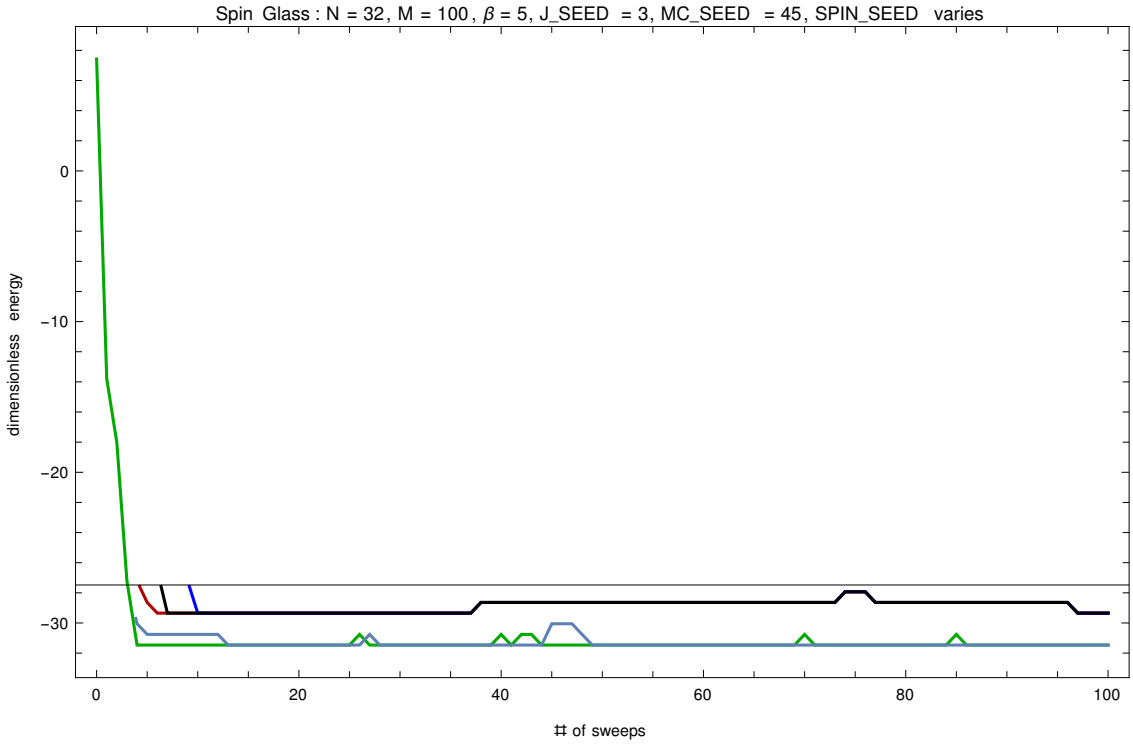
Out[130]=



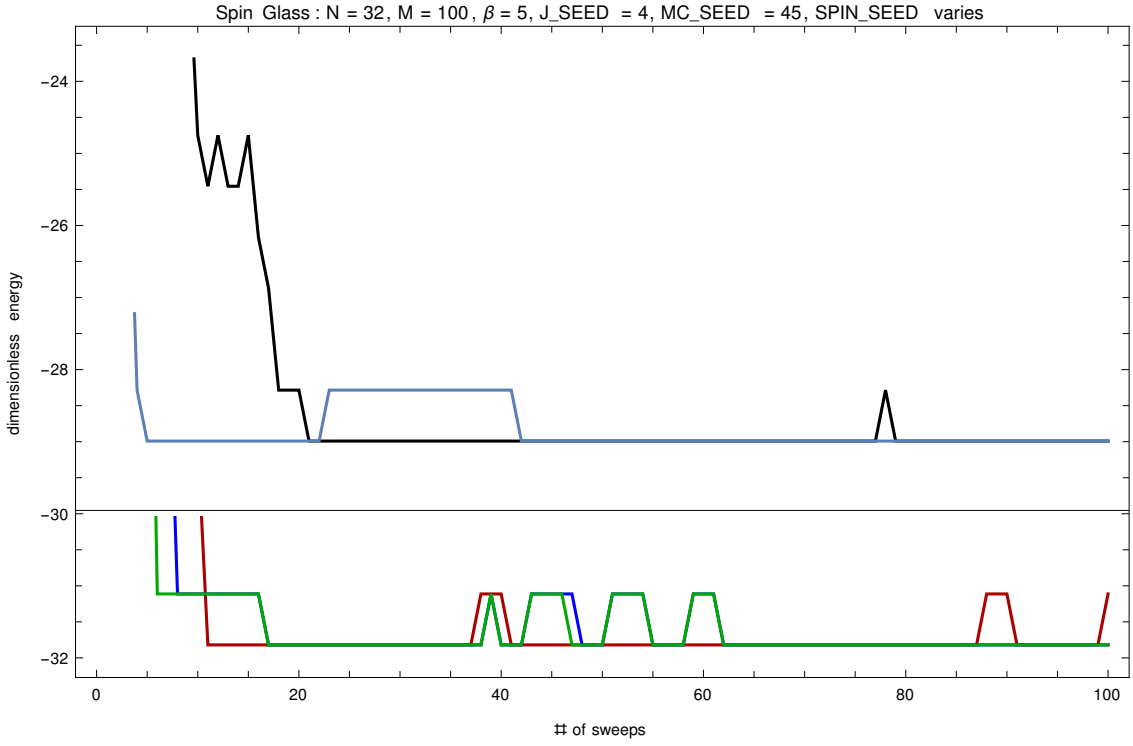
Out[131]=



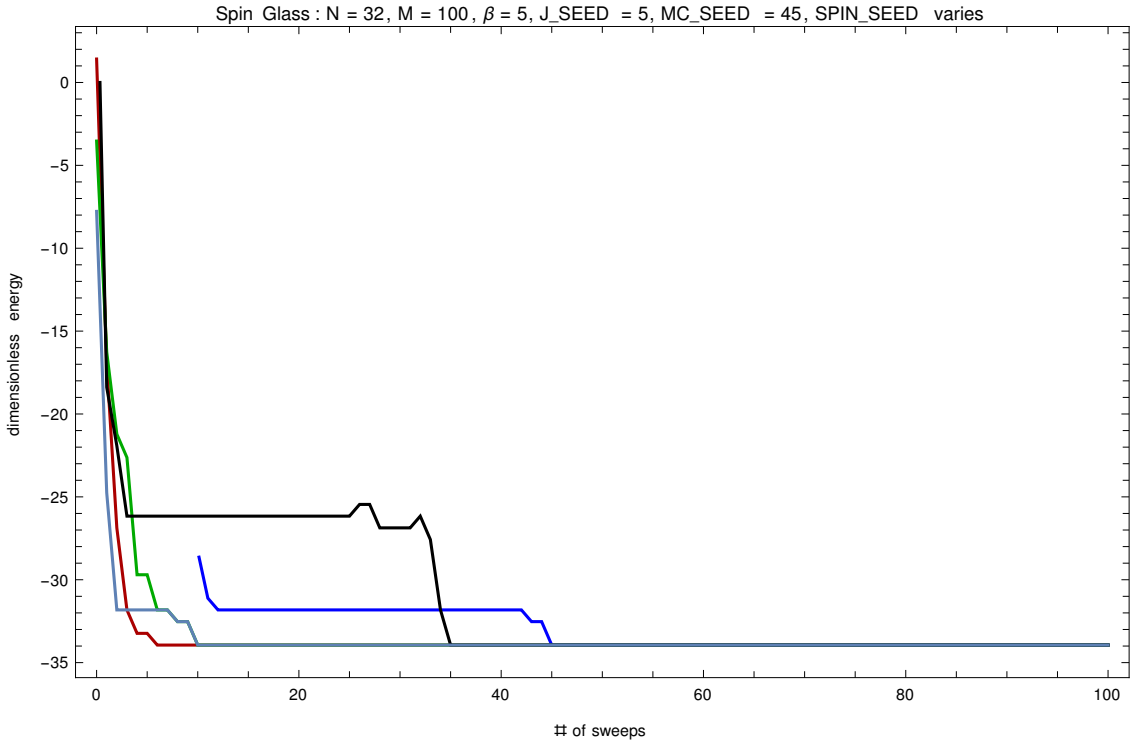
Out[132]=



Out[133]=



Out[134]=



Out[135]=