Data for "High-degeneracy Potts coarsening"

J. Denholm*
SUPA, Department of Physics, University of Strathclyde, Glasgow, G4 0NG, Scotland, UK
(Dated: January 10, 2021)

In the manuscript I present Monte Carlo simulations of the kinetic Potts model using basic, standard, methodology which I detail in the manuscript. There are four figures which require supporting data: Figure 1, Figure 3, Figure 4 and Figure 6. I include these data in this repository and provide in the following instructions for opening the files. Whenever I specify csv files, I do not provide instructions for opening them as virtually any software used for data analysis will suffice.

- Figure 1: There are three horizontal panels in this figure which, from top to bottom, are labelled (a), (b) and (c). Beneath each snapshot is the time at which it was captured. The data are stored in the files beginning with "fig-1...", and the metadata required to distinguish between each snapshot is specified in the file name. For example, the first image in Figure 1 (a) has the name "fig-1a-512.008295.bin". Note: these are binary files.

  To open the files, I suggest to use the freely available python library *Numpy*. To open, use the `numpy.fromfile` function and specify the `dtype` argument as `numpy.int32`. You will then need to reshape the array to size 50×50. Here is an example a python script that can load the images:

```
import numpy
grid = numpy.fromfile("fig-1a-512.008295.bin", dtype=numpy.int32).reshape(50, 50)
grid = numpy.roll(grid, -23, axis=1)
grid = numpy.roll(grid, 10, axis=0)
```

  This will give you the snapshot as a 2D array called `grid`, which has size 50×50. The roll commands simply recentre the image for aesthetic purposes, and do not change the data. One can repeat this for all of the images in Figure 1 by simply changing the file name argument.

- Figure 3: Here I plot the probability of reaching the ground state, as well as three, five, eight and twelve hexagon states. The data for each of these are saved in the files *fig-3-ground.csv*, *fig-3-hexagonal_3.csv*, *fig-3-hexagonal_5.csv*..., and so on. The csv files contain three columns: L, the lattice size; counts, the number of observations; N, the number of realisations considered. To obtain the probabilities plotted in the figure, simply divide the *counts* column by the N column.

- Figure 4: Here I plot four snapshots of final states which I describe in the manuscript. The files names associated with each of the panels—which are labelled in the figure—are *fig-4a.bin*, *fig-4b.bin*..., etc. The instructions for opening them are the same as those for Figure 1. Note: in this case the lattice size is 90, and not 50 as it was in Figure 1.

- Figure 6: Here I plot the number of clusters and extant spin states as functions for time for specified values of q. Specifically: $q \in \{3, 60, 3600\}$. For each value of q, I provide a csv file containing three columns: time, Nc (the number of clusters) and Eq (the number of surviving spin states). The file names are *fig-6-q3.csv*, *fig-6-q60.csv* and *fig-6-q3600.csv*.

* j.denholm@strath.ac.uk