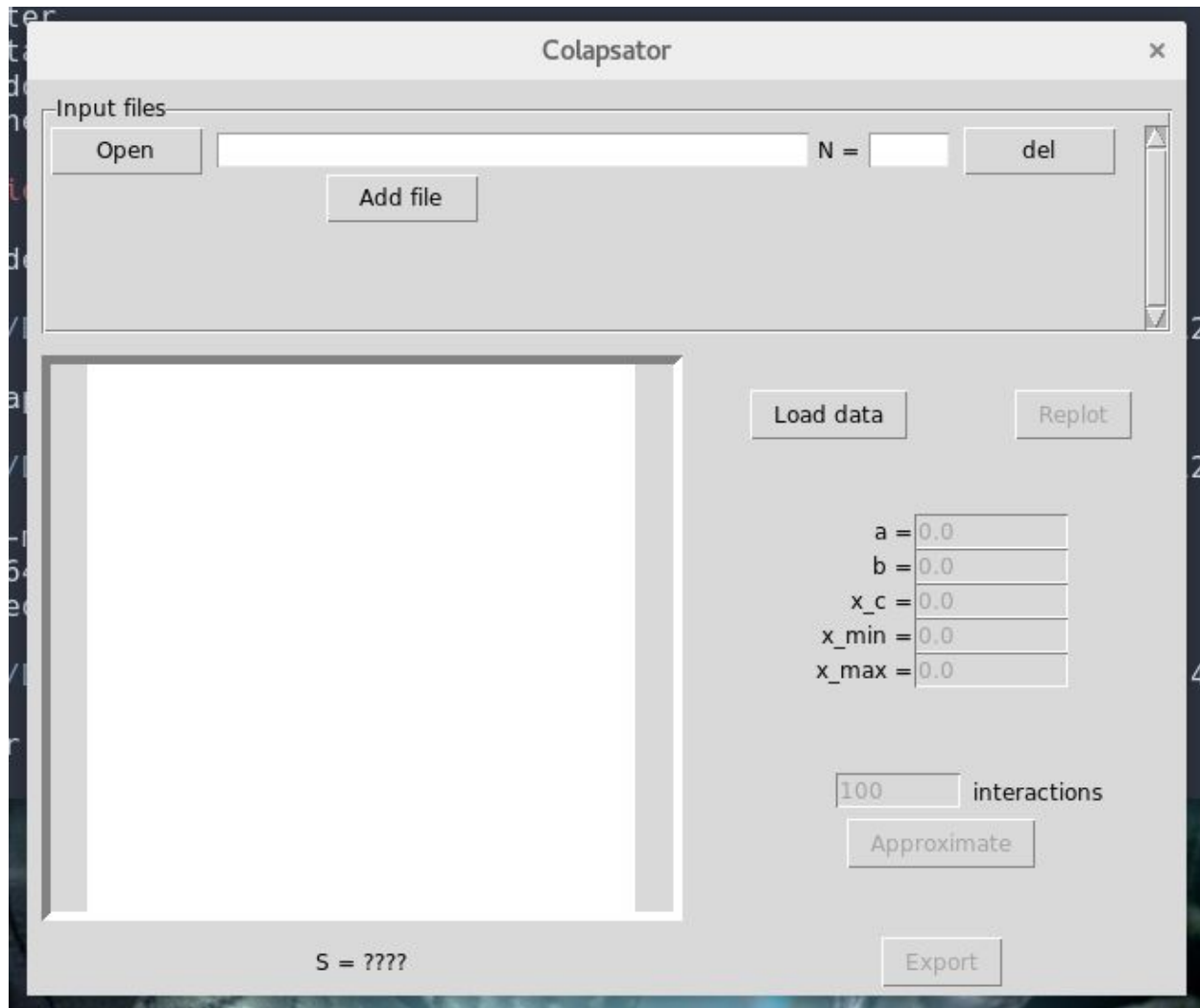


User guide

Colapsator

André Luis Oestereich



Introduction

This program was developed in order to facilitate data collapses for finite size scaling. It is python3 based and works well in several different platforms. Here we will show the basic usage instructions and functionalities.

Installation

The basic dependencies for this program are: python3, python3-numpy, python3-scipy, python3-matplotlib, tk and tcl. All these are available in usual ubuntu repositories and can be installed running

```
sudo apt-get install python3 python3-numpy python3-scipy  
python3-matplotlib tk tcl
```

With these dependencies installed the user should view the image of the previous page once the program has been run.

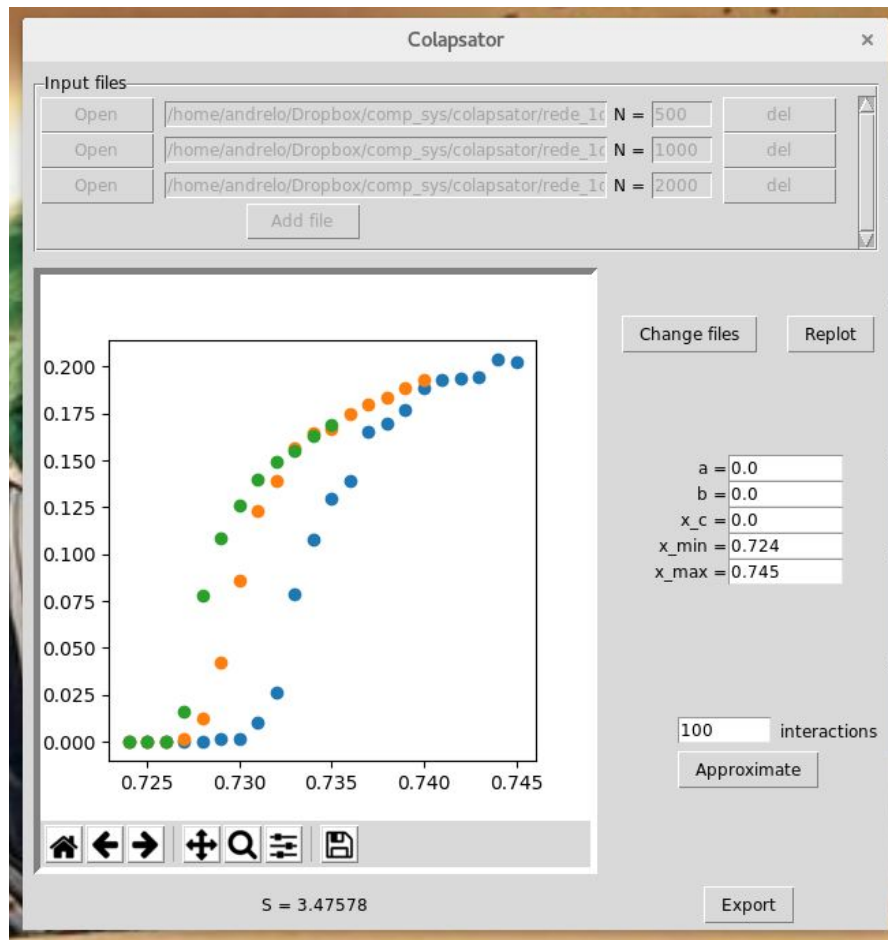
Usage

Input files

The input files contain the data that will be collapsed. You can use any number of files. To add a new file simply click the add file button and a new line will appear. Any file input can be removed by clicking the del button. You can inform the file location in the text box or click the open button in order to open a dialog where you can select your data file. Next to each file location there is the system size input box.

The only requirements for the input files is that they have 2 columns and a single system size. The first column will be regarded as the X variable and the second column as the Y variable. Any other columns in your file will be ignored. Different system sizes must be divided in different input files. Different input files don't need the same number of points and the order of the input files is also not important.

When you finish informing the file locations and system sizes click the Load data button. After this the program will check the validity of your files and system sizes, load the set of points and plot them. As can be seen in the image below.



Now you will not be able to load new files unless you click the Change files button.

Finding the best collapse

Once the data set is loaded a plot will appear and the collapse variables will be editable.

Where

- a is the exponent of the Y axis;
- b is the exponent of the X axis;
- x_c is the critical value;
- x_{min} and x_{max} give the range that is taken into account while calculating the distance between the curves.

You can manually change the values of the variables, if you do so the replot button will update the plot and the value of the distance between the curves (S) shown under the

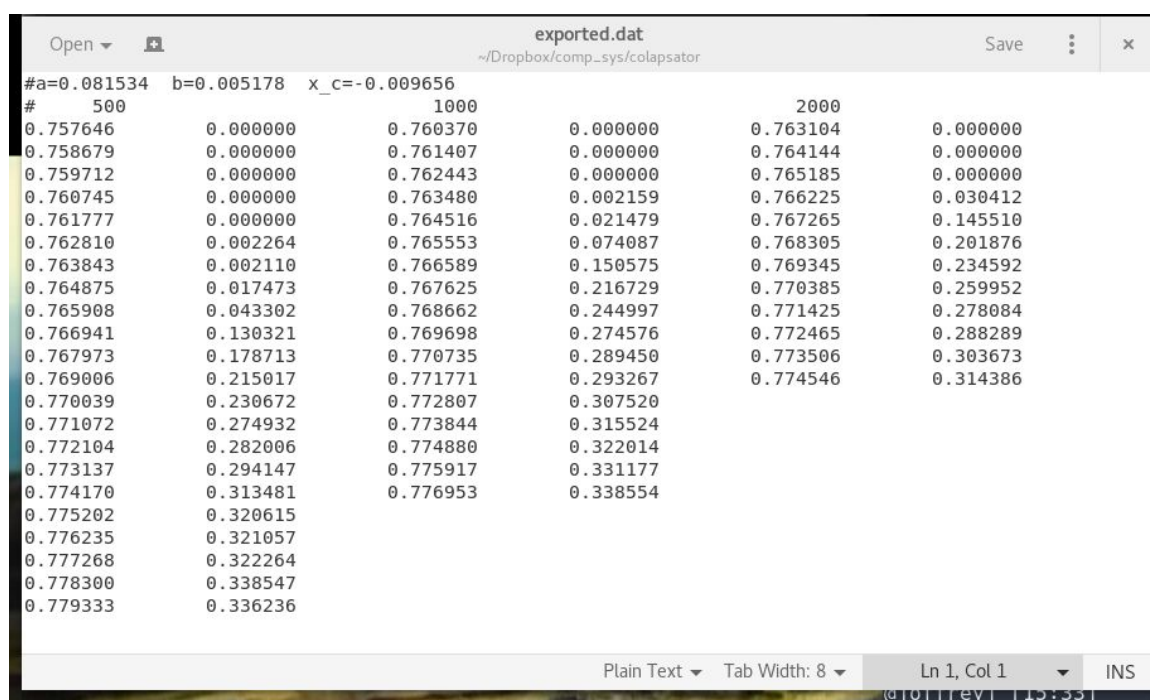
graph.

You can also use an automatic minimization of the distances between the curves. This can be done using the Approximate button. This will use the [Nelder-Mead minimization method](#). You can choose the number of interactions before stopping. The input values will be used as the initial guess for the minimization, so **if you get in a local minimum try to change the input values and run the minimization again.**

Exporting collapsed data

Once the collapse is finished the data can be exported to be plotted with the software of your preference. To do so just click the Export button. A dialog will appear in which you can choose the file destination.

In the output file the first line is a comment with the values of the collapse. The second line is the system size of the respective pair of columns. As can be seen below.



```
Open  [icon]  exported.dat  Save  [icon]  x
~/Dropbox/comp.sys/colapsator

#a=0.081534  b=0.005178  x_c=-0.009656
#          500          1000          2000
0.757646    0.000000    0.760370    0.000000    0.763104    0.000000
0.758679    0.000000    0.761407    0.000000    0.764144    0.000000
0.759712    0.000000    0.762443    0.000000    0.765185    0.000000
0.760745    0.000000    0.763480    0.002159    0.766225    0.030412
0.761777    0.000000    0.764516    0.021479    0.767265    0.145510
0.762810    0.002264    0.765553    0.074087    0.768305    0.201876
0.763843    0.002110    0.766589    0.150575    0.769345    0.234592
0.764875    0.017473    0.767625    0.216729    0.770385    0.259952
0.765908    0.043302    0.768662    0.244997    0.771425    0.278084
0.766941    0.130321    0.769698    0.274576    0.772465    0.288289
0.767973    0.178713    0.770735    0.289450    0.773506    0.303673
0.769006    0.215017    0.771771    0.293267    0.774546    0.314386
0.770039    0.230672    0.772807    0.307520
0.771072    0.274932    0.773844    0.315524
0.772104    0.282006    0.774880    0.322014
0.773137    0.294147    0.775917    0.331177
0.774170    0.313481    0.776953    0.338554
0.775202    0.320615
0.776235    0.321057
0.777268    0.322264
0.778300    0.338547
0.779333    0.336236

Plain Text  Tab Width: 8  Ln 1, Col 1  INS
@j011reyj [15:33]
```