Exact diagonalization User Manual

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https://github.com/JeanClaude87/BH_diagonalization
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Exact diagonalization of interacting Bose gases

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1 Quick User Guide

The SWaRP software package is a pure python code, consisting of two main scripts (*detectorDistortion.py* and *waveFront.py*) and several libraries (*func.py* - containing the main functions of the code, *EdfFile.py* - dedicated to handling the EDF file format, *norm_xcorr.py* - computes subset displacements using cross-correlation in the real-space, *g2s.py* - performs *grad2surf* integration). Being mainly a number-crunching code, it is currently designed to be ran directly from a terminal without a graphical user interface.

1.1 Installation

1.2 Running the code

2 Exact diagonalization principle

The first element to implement an Exact diagonalization algorithm is to find the best way to write the basis. In particular we need to index each state of the basis in a way that we can easily distinctly identify them. We will use the following table as an example:

```
"BC" : BC_inp,
"t"  : t_inp ,
"U"  : U_inp ,
"n_diag_state"  : n_diag_state_inp,
"cores_num" : cores_num_inp,
"mat_type" : mat_type_inp,
"PATH_now" : os.path.abspath('.'),
"parity"   : parity_inp,
}
```

3 Results

4 Data workflow

4.1 Main scripts and flow-charts

4.2 File handling