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| --- | --- |
| **1. Title of Software:** | **QuSpin: A Python package for exact diagonalization and dynamics of quantum many-body systems.** |

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**2. AUTHORS:**

**A. BU/BMC Authors Information:**

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| Phillip Weinberg | Creator, wrote source code, distributor. |
| Marin Bukov | Wrote source code. |
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| National Science Foundation | 1410126 |  | Anders Sandvik | Simulation studies of ground state phases and criticality in correlated quantum matter | July 12, 2014 - June 23, 2016 |
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| **A.** | Date(s) of creation of Software | United States | 2015: v0.0.1a | source code |
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The software is used to solve both static and dynamic properties of interacting systems of many spins/qubits.

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This software was developed for Python. It can be distributed on Linux/OS X/Windows 7-10 platforms.

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1. Source code

2. Documentation

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In condensed matter physics many interesting phenomena comes about via the strong interactions between the indivual components of the system. There are many tools availible to study these strongly interacting quantum systems in equalibrium but there are less tools availible to study them when they are driven out of equalibrium. The only tool availible to numerically study these strongly driven systems is via direct simulation of the Schrodinger equation in full hilbert space. Our software allows for an easy interface to do these simulations for arbitrary time dependent Hamiltonians for up to 32 qubits at a time. We also have symmetries implemented for 1-dimensional spin chains which are easy to turn on and off, as well as functions which can be used to measure observables as well as entanglement entropy of these systems dynamically.

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Its main feature here is an easy user iterface which allows one to simulate arbitrary spin interactions efficiently and easily with little programming experience. It is a useful tool for researchers as well as students to test new ideas and also gain intuition about these quantum many-spin systems.

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