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The density of states from first principles

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We present a novel algorithm to compute the density of states, which is proven to converge to the correct result.

The algorithm is very general and can be applied to a wide range of models, in the frameworks of statistical mechanics and lattice gauge theory.

All the thermal or quantum expectation values can then be obtained by a simple integration of the density of states.

As an application, a numerical study of 4d U(1) compact lattice gauge theory is presented.

Primary authors: Dr RAGO, Antonio (School of Computing & Mathematics, Plymouth, PL4 8AA, UK); Prof. LUCINI, Biagio (College of Science, Swansea University, Swansea, SA2 8PP, UK); Prof. LANGFELD, Kurt (School of Computing & Mathematics, Plymouth, PL4 8AA, UK); Dr PELLEGRINI, Roberto (College of Science, Swansea University, Swansea, SA2 8PP, UK)

Presenter: Dr PELLEGRINI, Roberto (College of Science, Swansea University, Swansea, SA2 8PP, UK)

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