

Abstract Submitted
for the CUWIP21 Meeting of
The American Physical Society

Exploring free energy states of small quantum systems GAUKHAR YESMURZAYEVA, SARAH SHANDERA, UNNATI AKHOURI, Pennsylvania State University — In quantum mechanics quantum bit or qubit is used to describe the simplest unit of quantum information. It is usually represented as a superposition of two states. Properties of natural objects in the Universe can be described by thermodynamics. The question is whether there is a simple thermodynamical description of the basic properties. In order to assess the complex phenomena, it is helpful to start with simple systems. The goal of the research is to find the analog of these phenomena with the use of simple qubit systems by assessing the free energy, dynamics, and other factors. The research is focused on the thermodynamical aspects of the systems and findings of the amount of qubits needed to satisfy the local free energy equations. The research is conducted under the supervision of Prof. Sarah Shandera and Akhouri Unnati.

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Date submitted: 04 Jan 2021

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