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A Simple Experimental Verification of Maxwell-Boltzmann Statistics

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Poster Presentation P26

**A SIMPLE EXPERIMENTAL VERIFICATION OF
MAXWELL-BOLTZMANN STATISTICS**

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The purpose of this research is an experimental verification of Boltzmann statistics. The goal is to design an experiment simple enough to demonstrate these ideas, which lie beyond the range of common experience, which can be completed by undergraduate students as part of normal undergraduate physics lab work. Several distinct but related experimental tests are under way. First, it will be shown that colloidal particles allowed to sediment follow the Maxwell-Boltzmann distribution. Second, it will be shown that these same colloidal particles diffusing in a spherical potential well do so in accordance with Boltzmann statistics. Finally, these same particles can be optically trapped, and from the Boltzmann statistics, we can extract the shape of the effective (optically defined) potential well.