

Abstract Submitted  
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**The Acoustic Simple Harmonic Oscillator: Experimental Verification and Applications** SAM MATTESON, Department of Physics, University of North Texas, Denton, TX — In his famous volume, *The Sensations of Tone*, published in 1877, Hermann Helmholtz introduced a resonator that was central to his investigations of acoustics. This talk revisits the device that Helmholtz described and examines it as a manifestation of an acoustic simple harmonic oscillator (SHO). The presentation demonstrates that an enclosed volume which communicates with the outside world via a narrow tube exhibits a single strong frequency response in analogy to a mechanical SHO, along with weaker resonances of the air in the short pipe that comprises the “neck.” The investigations, furthermore, report results of a straightforward experiment that confirms the SHO model (with damping) and that is very accessible to undergraduate students using inexpensive equipment and internet-obtainable freeware. The current work also extends the analysis to include applications of the Helmholtz Resonator to several folk instruments, namely, the ocarina, whistling, and the “bottle band.”

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