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Modeling of Helmholtz resonators for application in passive noise control MATTHEW CALTON, SCOTT SOMMERFELDT, Brigham Young University — Acoustic resonators, such as the Helmholtz resonator, can be used to attenuate unwanted noise in a space. However, the classic Helmholtz resonator provides attenuation over a very narrow frequency band. This research aims to accurately model different resonator designs and to use those resonator models to investigate different configurations that can be developed to achieve a broader usable bandwidth. Using higher order approximations, more accuracy can be obtained in calculating the impedance and resonance frequency of a single Helmholtz resonator, which will then carry over into the overall configuration of the model. The impedance of a system of Helmholtz resonators in parallel is also considered, where the effects of acoustic coupling can be observed.

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