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Modeling and empirical evaluation of noise reducers for low-frequency acoustical spectrum sensing systems

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Abstract

This paper studies the performance of electro-acoustical modeling technique for mechanical noise reducers in low-frequency applications. To this end, firstly we introduce the electrical equivalents of fundamental acoustic elements and then, propose an equivalent circuit for the entire noise reduction system, which enables us to derive its overall frequency response. In order to validate the proposed modeling method, we implement the complete acoustical sensing system in real environment and compare its performance with simulated mathematical model. Empirical results confirm the proposed modeling technique for acoustical noise-reduction spectrum sensing applications.

Keywords: Noise-reduction filter, Acoustical spectrum sensing, Low-frequency, Sound.

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