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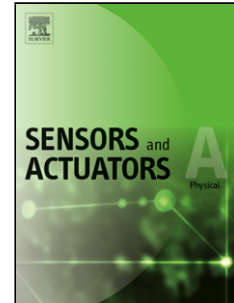
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# A Review of Acoustic Compressors and Pumps from Fluidics Perspective

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## Highlights

- This review serves as literature resource for those from acoustics and fluidics
- Current technologies in acoustic compressor/pumps are reviewed briefly
- This review also provides a critical assessment of the state of the art
- Emphasis is given on the role of resonator design for maximized performance
- The review also includes suggestions for future designs

## Abstract

Fluidics has the advantage of using no-moving-parts to manage fluid motion. Acoustic compressor/pump has become the latest entry into the field of fluidics as a no-moving-part pumping technology. Despite the advantage of using no-moving-parts, there are only a few acoustic fluidic pumps that have been physically built and tested to date. However, in the acoustics field, there are many acoustic pumps built employing moving-parts rectifiers. The fluidics field can benefit immensely from the recent advances made in acoustic compression technology, while the acoustic field can benefit from the plethora of work that already exists in fluidics. Although researchers have conducted extensive studies on this topic during the last few decades, no single resource lists, examines, combines and infers the immense information about it. This review offers a collective resource, tracing the development of the acoustic compressor/pump from its invention to recent advances, in terms of understanding, prediction, and application. This brief review (a) serves as a literature resource for researchers from various areas (especially from the field of acoustics and fluidics) (b) provides a critical assessment of the state of the art, and (c) provides suggestions for future designs.

*Keywords:* Fluidic pump; acoustic compressor; acoustic pump; valve-less standing wave pump; suction pump; nonuniform resonator; fluidic diodes

## 1 Introduction

Fluidics is a field of managing fluids (like pumping, distributing, amplifying, etc.) without using moving components. Pumps which employ no-moving-part valves are generally referred to as fluidic pumps. Tippetts and co-workers [1–3] pioneered the usage of fluidic pumps idea

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