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Fiber-optic Fabry-Perot interferometer based high sensitive cantilever microphone

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Highlights

- A fiber-optic Fabry-Perot interferometer based high sensitive cantilever microphone is proposed.
- The small fiber-tip sensor head and the demodulation module are connected by a single fiber.
- High sensitivities in the frequency range from 100 Hz to 3 kHz.
- The pressure sensitivity and the noise-limited minimum detectable acoustic pressure level are measured to be 364 nm/Pa and $8.5 \mu\text{Pa}/\text{Hz}^{1/2}$ at 1 kHz.

Abstract

We demonstrate a high sensitive cantilever microphone based on fiber-optic Fabry-Perot interferometer. A stainless steel cantilever is manufactured by laser micro-machining technique. The size of the cantilever is $2 \text{ mm} \times 1 \text{ mm}$, and the thickness is $10 \mu\text{m}$. The air gap between the fiber endface and the cantilever forms the Fabry-Perot cavity. Acoustic sensing test demonstrates high sensitivities in the frequency range from

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