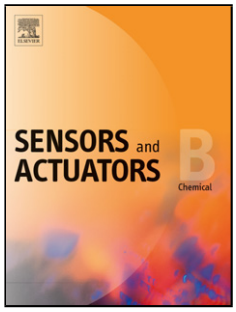

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In-situ ultrasensitive label-free DNA hybridization detection using optical fiber specklegram

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Highlights:

- A new low-cost bio-molecule sensor based on fiber specklegram, achieving ultrahigh sensitivity and stability with a compact envelope.
- The new fiber-optic sensor achieves label-free DNA detection with a sensitivity of 10^{-16} M – the best fiber-based DNA sensor reported to date.
- The high sensitivity is realized via a new temperature compensation method with a custom-designed microfluidic chip.

Abstract:

In this work, we present a compact and ultrasensitive bio-molecule sensor based on fiber specklegram, achieving a DNA detection sensitivity of 10^{-16} M. To our knowledge, the new device