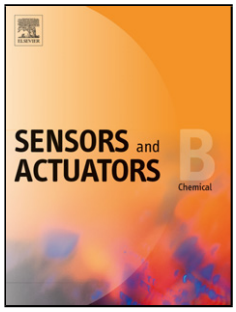

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A Rayleigh Surface Acoustic Wave (R-SAW) Resonator Biosensor based on Positive and Negative Reflectors with Sub-Nanomolar Limit of Detection

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Highlights

- A surface acoustic wave-based, high performance biosensor is presented.
- The biosensor is benchmarked against biotin-streptavidin binding.
- The sensitivity is -296 m^2 kg^–1 and the limit of detection is 104 pM.
- The biosensor sensing range is compatible with health- and safety-related assays.

Abstract

A label-free sub-nanomolar Rayleigh surface acoustic wave (R-SAW)-based resonator biosensor is demonstrated for biomolecular detection in liquid after drying. The biosensor comprises two interdigital transducers for R-SAW generation and two positive and negative reflectors to confine the acoustic energy in the sensitive area. We benchmark this biosensor against biotin-streptavidin binding, which is a standard, well-known model for a variety of biosensing processes. The experiments demonstrate a limit of detection of 104 pM and a