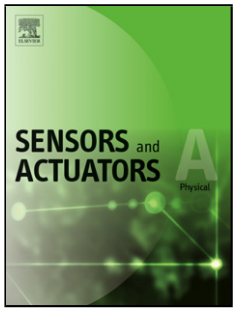

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Label-free ferrule-top optical fiber micro-cantilever biosensor

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Highlight

- Optical fiber addressed cantilevers have been reported previously in the literature and in this paper we propose techniques to design and fabricate polymer micro-cantilevers onto the end of standard single mode fibers using ns-laser machining. The sensor combines sensing probe with standard optical fibers as a delivery device. Low-cost optical sources and a fiber coupled spectrometer are employed to monitor the cantilever deflection and thereby observing biological binding between species of interests and activated cantilevers. A few biological experiments are conducted with the sensor developed in this paper:
- Biotin and streptavidin binding with a minimum detectable level of 10nM;
- Surface stress monitoring of SAM process on cantilever surface;
- Detection of *Listeria* food pathogen with minimum detectable concentration of less than 10^5cfu/ml;
- The benefit of the sensors is that it can provide rapid, reliable sensing platform, which can potentially not only be portable but also using minimal quantities of biological sample volumes. The ferrule-top cantilever opens a new route for label-free rapid portable biosensing platform with potentially low-cost fabrication process.