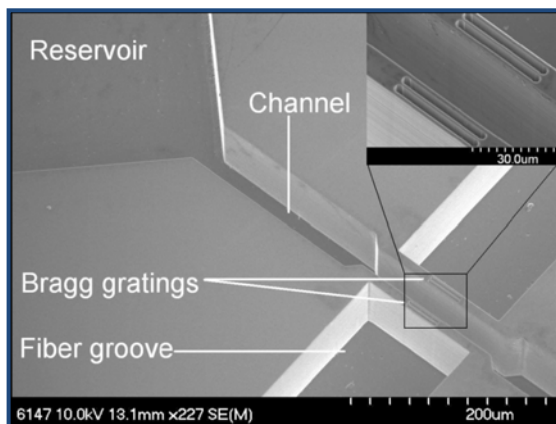


High Resolution Integrated Microfluidic Fabry-Perot Refractometer in Silicon

Technology

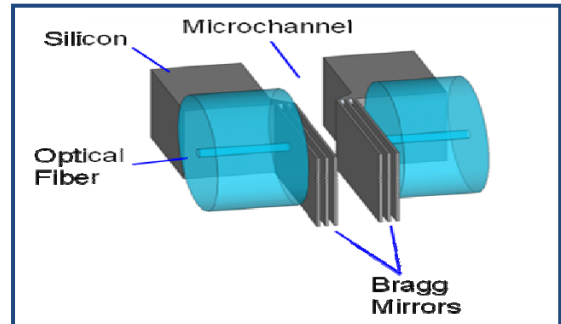
The organization of this Fabry-Perot cavity opens the way to characterization of a particle in a volume for analyses like flow cytometry. Our sensor, by confining a cell in a resonator through which light makes several passes, could yield superior resolution compared with those where the light passes through the sample only once.

In addition, components are fabricated simultaneously in a conventional microfabrication process (DRIE) and can be integrated into microfluidic systems.



Description

The liquids are placed in the reservoir where they flow (due to the capillary effect) into the microchannel and to the Fabry-Perot cavity formed by the two Bragg reflectors. Light from a broadband light source is incident on the Fabry-Perot's reflective surfaces from an optical fiber placed in the alignment groove. The transmitted light is collected by a second optical fiber, which is connected to an optical spectrum analyzer.



Applications

Given its portability and performance, this refractometer can be used as a sensor for cell detection (in flow cytometry, chromatography, etc). Its integration on microfluidic devices means it can be used in a lab on a chip.

It can also be used to measure the concentration of non-absorbing/non-fluorescent compounds in liquid-phase separation systems (e.g. liquid chromatography).

Advantages

- ◆ **Low production cost.** Standard microfabrication.
- ◆ **Easy manufacturing.** Entire structure is created in a single photolithography step and etched by standard deep reactive ion etching (DRIE) process.
- ◆ **High resolution.** Sensitivity of 920nm/RIU and detection limit of $\Delta n = 10^{-5}$ (when tested experimentally with homogenous liquids).
- ◆ **Portable.** On-chip laboratory integration.
- ◆ **Very robust, reusable.**

Business Opportunity

Univalor is seeking a commercial partner to support development and commercialization.

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Our Reference: VAL-654-EP

US Patent 12/228175: "Mems tunable silicon fabry-perot cavity and applications thereof"