

Characterization of the Dispersion Phenomenon in an Optical Biosensor

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Abstract : Optical biosensors have become a powerful detection and analysis tool for wide-ranging applications in biomedical research, pharmaceuticals and environmental monitoring. This study carried out the computational fluid dynamics (CFD)-based simulations to explore the dispersion phenomenon in the microchannel of an optical biosensor. The predicted time sequences of concentration contours were utilized to better understand the dispersion development occurred in different geometric shapes of microchannels. The simulation results showed the surface concentrations at the sensing probe (with the best performance of a grating coupler) in respect of time to appraise the dispersion effect and therefore identify the design configurations resulting in minimum dispersion.

Keywords : CFD simulations, dispersion, microfluidic, optical waveguide sensors

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