Contribution ID: **785** Type: **Poster**

A Particle Detection Modeling of Non-contact Coplanar Differential Impedance Sensor in Microfluidic System

Monday 21 May 2018 17:45 (1 hour)

Over the last few years, study of microfluidic flow cytometry using electrical signals has developed at a fast pace. There are several electrical detection configurations but differential impedance sensing offers a greater advantage due to its capability of cancelling common noise from the detected signal, resulting in improved signal to noise ratio. This paper presents the simulation of a differential impedance sensor by employing the finite element method to gain an insight and to find the proper range of the working excitation frequency for the detection system. A polystyrene microbead was used as a model particle flowing past the detection area that had non-contact excitation and two pickup coplanar electrodes in which an excitation electrode was positioned between the two pickup electrodes. The modeling results showed that for a 2 μm PDMS separation layer, the range of optimal excitation frequency was about 100 - 1000 Hz when DI water was a background medium. The bead size to microchannel height ratio was found to affect the sensitivity of detection, in which the closer the height ratio was to the unity ratio, the more current was detected. The results of the simulation study will be used in fabricating an actual device for microfluidic particle cytometry applications.

Authors: Mr MASAEN, Korkuson (Master's Degree Program in Physics, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thailand); Dr PUSSADEE, Nirut (Plasma and Beam Physics Research Facility, Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thiland)

Co-authors: Prof. TECHAPIESANCHAROENKIJ, Ratchatee (Department of Materials Engineering, Faculty of Engineering, Kasetsart University, Bangkok 10900, Thailand); Ms SANGLAO, Jongrak (Master's Degree Program in Physics, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thailand); Mr CHIMSIRI, Pongsaran (Master's Degree Program in Physics, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thailand)

Presenter: Mr MASAEN, Korkuson (Master's Degree Program in Physics, Faculty of Science, Chiang Mai University, Chiang Mai, 50200, Thailand)

Session Classification: A08: Instrument (Poster)

Track Classification: Instrumentation, Metrology and Standards