Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Multifunctional nanopipette for simultaneous ionic current and potential detection of nanoparticles[1] NAMUNA PANDAY, JIN HE, Florida International University — Nanopipette has been demonstrated as a nanopore type biosensor for DNA, protein, nanoparticle and virus analysis. In the last two decades, nanopore based technologies have made remarkable progress for single entity detection and analysis. Multifunctional nanopipette for multi-parameter detection is a new trend for nanopore based technique. We have developed a technique to fabricate multifunctional nanopipette which contains both nanopore and carbon nanoelectrode (CNE) at the nanopipette tip. It can be quickly, cheaply and reproducibly fabricated from theta pipettes. We have been able to use this multifunctional nanopieptte for simultaneous detection of ionic current and local electrical potential changes during translocation of charged gold nanoparticles (GNPs) which is used as a model experiment. The CNE functions as a local potential probe. We have demonstrated that it can detect the local potential change during translocation of a single GNP as well as collective potential change due to cluster of GNPs outside the nanopore entrance. From the potential change, we can also have insight of motion of GNPs before entering the nanopore. We have also tested insulating and biological NPs with various size and charge. Observed results have shown correlations between ionic current and potential change during translocation of these NPs.

[1]Florida International University

Namuna Panday
Florida Intl Univ

Date submitted: 08 Nov 2016 Electronic form version 1.4