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Detecting antibody-antigen reaction using nano ripple gold LSPR based biosensor IRAM SALEEM, DHARSHANA WIJESUNDERA, BUDDHI TILAKARATNE, Department of Physics, University of Houston and Texas center for superconductivity TcSUH, WILLIAM WIDGER, Department of Biology and Biochemistry, University of Houston and Texas center for superconductivity TcSUH, WEI-KAN CHU, Department of Physics, University of Houston and Texas center for superconductivity TcSUH — We introduce a simple and cost-effective scheme for bio-sensing using nano-ripple structures. One-dimension metallic nano-ripple structures formed by gas cluster ion beam irradiation have shown polarization of light as well as the localized surface plasmon resonance. These localized surface plasmon resonance (LSPR) based bio sensors not only are capable of label free real time analytical detection but also show high sensitivity. The nano surface morphology determines the changes in the plasmonic properties of nanostructures hence the plasmonic response is tunable. By immobilizing a stable and sterically accessible monolayer of antibody on the surface of these substrates and loading different concentrations of the specific antigen we identified the shift in the LSPR peaks triggered by the change of dielectric function in the neighborhood of the structures. These plasmonic nano-metallic structures can be utilized to observe the shift in the LSPR resonance frequency due to the cycle of adsorption, re-adsorption and reactions taking place on the surface that can potentially be mapped in to reaction mechanics. The bio-sensor has monolayer molecule-coating sensitivity and specific selectivity.

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