Department of Electrical and Computer Engineering
North South University

EEE 499
Senior Project Design

Dielectric and Plasmonic Hybrid Heterodimer Pair: Reversal of Nearfield Optical Binding Force

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Declaration

This is to declare that no part of this report or the project has been previously submitted elsewhere for the fulfillment of any other degree or program. Proper acknowledgement has been provided for any material that has been taken from previously published sources in the bibliography section of this report.

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Approval

The Senior Design Project entitle “Dielectric and Plasmonic Hybrid Heterodimers: Reversal of Optical Binding Force” by Md. Mahbubuzzaman (ID: 162079943) and Sonjoy Sarker (ID: 1620531043) has been accepted as satisfactory and approved for partial fulfillment of the requirement of BS in EEE degree program.

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ABSTRACT

Reversal of the optical binding force is one of the fastest growing and auspicious area of optical manipulation. We used optical manipulation to find the reversal optical binding force. Until now optical manipulation was used to find reversal in far field. Two counter propagating plane waves were used on sphere shaped dielectric and plasmonic nano dimers. In our setup we used plasmonic substrate in some cases to get strong reversal of binding force. We kept the dielectric and plasmonic nano dimers in air medium and in one of our setups we polarization of dielectric (Y polarized) and plasmonic (Z polarized) were different. Our study provides a sturdy approach to gain a reversal of optical binding force using plane light wave. The optical binding forces we got were immensely sensitive to inter particular distance.