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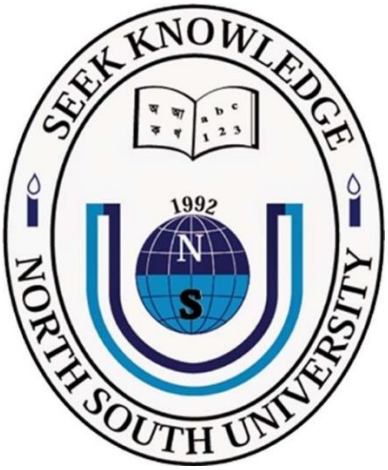

Senior Project Design

Metasurface "Solar Sail" For Flexible Motion Radiation Pressure Control

Team Members:

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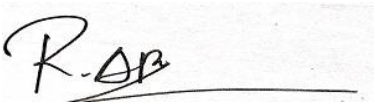
Fall 2020

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 “Metasurface “Solar Sail” For Flexible Motion Radiation Pressure Control” by Rifat Sarker APU and Mohammad Sabbir Ahmed has been accepted as satisfactory and approved for partial fulfillment of the requirement of BS in EEE degree program.

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Abstract

We analyzed the theoretical and experimental data of metasurface solar sails and their effect on the three forces (repulsive, attractive, lateral) applied to the sail. Our experiment goal is to control radiation pressure that's the solar sail motion rage will be increase. In addition, we present mathematical analyzes on different electromagnetic field and make a balance with our experimental data. Using unusual optical reflections from metasurface to generate pure forces in the plan. Specially we design a new metasurface and experiment by previous researchers' theory and compare with previous work. we also present mathematical synthesis and make configuration that allow to achieve pushing and lateral for new metasurface.