

Abstract Submitted  
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**Development and Optimization of Photocatalytic Air Disinfection System**<sup>1</sup> TIMOTHY POWELL, JEREMIAH WILSON, LAMONT HENDERSON, SSHA SRINIVASAN, PRAKASH SHARMA, Department of Physics, Tuskegee University — Photocatalytic air disinfection (PAD) systems are researched thoroughly towards increasing their maximum efficiency and rate of disinfection processes. Various parameters such as light irradiation, photocatalytic air filter location, gas purging and sampling etc. were optimized via both experimental and theoretical models. Development and optimization of different models are under investigation and will be presented. The objectives of this project are to (a) develop a radiation intensity model to derive the intensity field characteristics in absorbing, reacting, and scattering reaction media in which the rate of the reaction initiation step is expressed as a function of the local volumetric rate of energy absorption (LVREA); (b) develop a model for inactivation of microbes in a filter fiber media using mathematical and experimental data. The ultimate goal of this task is to ensure that the proposed models are true representations of photocatalytic air disinfection. The models developed in this research will be validated with experimental results from a full-scale instrumentation setup in the laboratory.

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