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Remote characterization of flying mosquitoes using an infrared Lidar system ADRIEN GENOUD, ROMAN BASISTYY, New Jersey Institute of Technology, GREGORY WILLIAMS, Hudson Regional Health Commision, Rutgers University, BENJAMIN THOMAS, New Jersey Institute of Technology — More than one million people die every year due to mosquito-borne diseases. As of now, most study of mosquito population is done through trapping methods that are tedious to set up, costly and present scientific biases. Lack of reliable data on the spatial distribution and population dynamics of key mosquito species has become a major obstacle to the development of predictive spatial models for risk of exposure to key vectors. This project describes an innovative technique for the remote sensing of mosquito population. Based on an infrared continuous wave Lidar, the presented technique aims at the remote characterization of flying mosquitoes. By retrieving the insect's wing beat frequency, this new entomological Lidar can count and differentiate male from female of the Aedes Albopictus, Aedes Aegypti and Culex Genus with an accuracy of at least 94 percent. This study also evaluates the relevance of wing beat frequency alone as a predictor variable for mosquito species classification. The ability to collect extensive data with automatic characterization will enable entomological studies to better understand population dynamics and behavior, migration patterns and circadian rhythm as well as evaluate the impact of new and existing mosquito control methodologies.

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