

Abstract Submitted  
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**Monitoring the aerial density and circadian rhythm of flying insects using a near-infrared stand-off optical sensor**<sup>1</sup> ADRIEN GENOUD, New Jersey Institute of Technology, GREGORY WILLIAMS, Center for Vector Biology, Rutgers University, BENJAMIN THOMAS, New Jersey Institute of Technology — Although small in size, insects are a quintessential part of terrestrial ecosystems due to their large number and diversity. However, estimating trends in population of specific insect groups, both on a local or global scale, greatly suffers from our inability to collect entomological data. Photonic sensors to monitor insects are a potential solution to this lack of data, as they can observed thousands of insects per day with a temporal resolution in the minute range. Here, we present the results of a field experiment where the activity of insects has been monitored continuously over 3 months using an entomological stand-off optical sensor (ESOS). The aerial density (insects/m<sup>3</sup>) of flying insects is obtained from optical backscatter signals of insects transiting through a near-infrared laser beam. The collected data allowed for the study of the circadian rhythm and daily activities as well as the aerial density dynamic over the whole campaign for each cluster individually. We believe that this new type of data can unlock many of the current limitations in the collection of entomological data, especially when studying the population dynamics of insects with large impacts on our society, such as pollinators or vectors of infectious diseases.

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