

Abstract Submitted  
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**Generation of Sound from Flapping Wings of Mosquitoes<sup>1</sup>** JUNG HEE SEO, Johns Hopkins University, TYSON HEDRICK, University of North Carolina Chapel Hill, RAJAT MITTAL, Johns Hopkins University — It has long been recognized that mosquitoes use “wing tones” (sound generated by flapping wings) for communication and signaling during mating. Previous experimental studies showed that the wing tone based “communication” between conspecifics is complex, and it conveys important information about fitness and sexual interest. The mechanisms of wing tone generation and the characteristics of its sound field are however not well understood. Mosquitoes (e.g. *Culex*) that employ wing-tone communication have very unique wing kinematics (high frequency and small stroke amplitude) compared to other insects of similar size and it has been speculated that this facilitated wing-tone communication. In the present study, the generation of wing-tones in a mosquito (*Culex*) is computationally investigated to explore the speculation. The flow field around a hovering mosquito is simulated by solving the incompressible Navier-Stokes equations using a sharp-interface immersed boundary method, and the aeroacoustic sound is predicted by the Ffowcs Williams and Hawkings equation. The analysis of the simulation data suggests that the kinematics employed by these mosquitoes facilitates efficient generation of wing-tones.

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