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Flight of the smallest insects LAURA MILLER, ARVIND SANTHANAKRISHNAN, TYSON HEDRICK, University of North Carolina at Chapel Hill, ALICE ROBINSON, California Institute of Technology — A vast body of research has described the complexity of flight in insects ranging from the fruit fly, *Drosophila melanogaster*, to the hawk moth, *Manduca sexta*. Over this range of scales, flight aerodynamics as well as the relative lift and drag forces generated are surprisingly similar. The smallest flying insects (Re$\sim$10) have received far less attention, although previous work has shown that flight kinematics and aerodynamics can be significantly different. In this presentation, we have used a three-pronged approach that consists of measurements of flight kinematics in the tiny insect *Thysanoptera* (thrips), measurements of flow velocities using physical models, and direct numerical simulations to compute lift and drag forces. We find that drag forces can be an order of magnitude larger than lift forces, particularly during the clap and fling motion used by all tiny insects recorded to date.

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