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Electroactive Polymer based flow control at Low Reynolds Numbers SARAH ZAREMSKI, MICHAEL AMITAY, Rensselaer Polytechnic Institute — Electroactive polymers (EAPs) are used to achieve distributed, conformal actuation on aerodynamic surfaces, promote transition in places where laminar separation occurs, and maintain laminar flow where there is no separation. In this work, the feasibility of the EAPs in mitigating a laminar separation bubble on a flat plate was examined. First, the performance of the EAPs was evaluated using a Laser vibrometer and a high-speed camera to quantify the response of the EAP to input voltage and driving frequency and to better understand the physics of the actuator itself. Then, measurements using Stereoscopic particle image velocimetry were conducted in the vicinity of the EAP. Several parameters, such as the driving frequency, the input voltage, and the dimple size, were tested. Preliminary data show promising results, where the size of the separation bubble was significantly reduced when the EAPs were driven at the appropriate voltages and frequencies.

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