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The relationship between DBD performance in ambient and flowing air MOHAMMED SIDDIQUI, ALI GULEC, LUTFI OKSUZ, RICCARDO BONAZZA, NOAH HERSHKOWITZ, University of Wisconsin - Madison — Dielectric barrier discharges (DBDs) have been shown to reduce flow separation on airfoils in flowing air [1], as well as impart momentum into ambient air [2]. The relationship between DBD performance in both regimes is not well understood. We previously investigated a novel DBD discharge regime in ambient air first discovered by Hoskinson et. al.[3], where for cylindrical exposed electrodes, as the electrode diameter was reduced below $50 \mu\text{m}$, the force divided by power dissipated in ambient air increased exponentially. We now investigate the ability of these DBDs to reduce flow separation in flowing air of $\text{Re} \sim 5\text{E}5$ and how it relates to their discharge characteristics in ambient air. The results are presented here for the first time.

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[2] M. Forte et. al. *Exp. Fluids*, 43, 917-928 (2007).

[3] A. R. Hoskinson, N. Hershkovitz, and D. E. Ashpis, *J. Phys. D: Appl. Phys.*, 41, 245209 (2008).

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