Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Towards In-Flight Applications? - Requirements on the Dielectric Barrier Discharge (DBD) Plasma Actuator (PA) JOCHEN KRIEGSEIS, Karlsruhe Institute of Technology, BERNHARD SIMON, Technische Universitt Darmstadt, SVEN GRUNDMANN, University of Rostock — Most of todays flow control (FC) efforts with DBD show a rather one-sided picture. Typically, either the discharge properties are discussed extensively or FC achievements are reported. The former group of contributions only pays limited attention to implications and consequences of most characteristics with respect to subsequent control steps for successful DBD-based FC - the latter group mostly ignores changing discharge properties, thus varying control authority for the respective applications when changes of environment, PA health state or simply a varied angle-of-attack are to be considered. In addition, there still remains a fair bit of uncertainty regarding a universal PA-evaluation metric, such that some of the most promising quantities/characteristics for successful controller operation remain largely untouched from the community. The purpose of the present work is to outline the requirement profile of PAs in one coherent story starting from electrical issues all the way down the road to in-flight FC success, where particular emphasis is placed on the interplay of the involved subtopics. It is hypothesized that such a clear guideline is the only way to advance beyond the present level of lab studies, where there still is an obvious lack of real flight applications.

Jochen Kriegseis
Karlsruhe Institute of Technology

Date submitted: 30 Jul 2016 Electronic form version 1.4