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Effect Of Dielectric Permittivity And Gas Pressure On Breakdown Voltage In Solid-Gas Systems.[1] IGOR TIMOSHKIN, MARK WILSON, MARTIN GIVEN, SCOTT MACGREGOR, Department of Electronic and Electrical Engineering, University of Strathclyde, 204 George Street, Glasgow, UK, NELLY BONIFACI, RACHELLE HANNA, University of Grenoble Alpes, CNRS, Grenoble INP, G2Elab, F38 000 Grenoble, FRANCE — The development of more energy efficient/more electric aircrafts require advanced electrical systems which should operate in challenging environmental conditions: lower air pressure, elevated humidity, a wide range of temperatures. Also, there is a growing interest in using elevated DC voltage levels in the electrical avionic systems in order to reduce conduction losses and to transmit increased levels of power. Thus, the higher voltage levels result in the requirement for the electrical wiring systems to be capable of operating at the high DC voltage levels. However, the lower air pressure leads to lower critical voltages at which gas discharge processes such as corona discharges can be triggered. The present paper investigates the electric field distribution in solid dielectric-gas (air) systems. The obtained electric field is used in the analysis of the safe operating voltages. The results presented and discussed in this paper can be used for insulation coordination, optimisation of spacing between energised and grounded components, and selection of suitable solid dielectrics for avionic electrical systems. Acknowledgement. This work is supported by The British Council-Alliance Hubert Curien Programme.

[1]Effect Of Dielectric Permittivity And Gas Pressure On Breakdown Voltage In Solid-Gas Insulation Systems

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