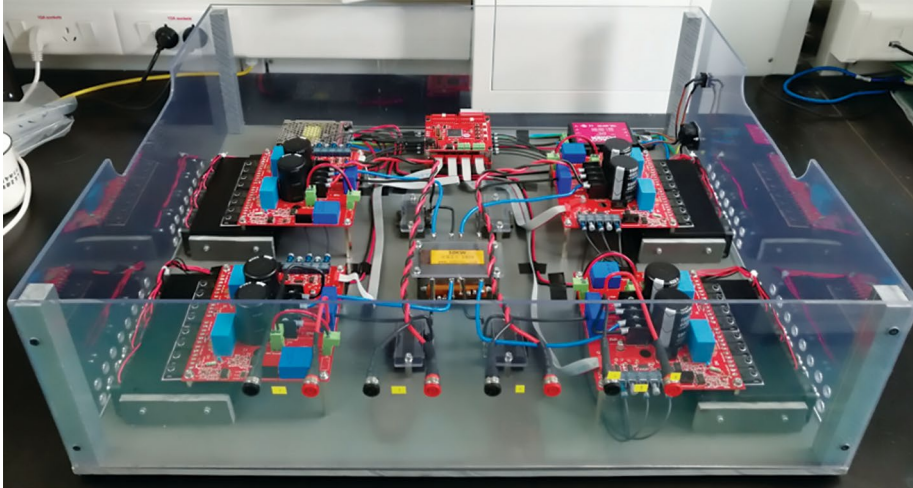


POWER ELECTRONICS

A balancing act for electric aircraft power systems

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Credit: IEEE

Approximately 2% of the world's greenhouse gas emissions come from aviation.

Electric aircraft are often advocated as an environmentally friendly alternative to aircraft based on gas propulsion. However, due to the low energy density of today's best battery technologies, electric planes are currently limited to impractically short journeys. Further improvements in battery technology, advances in lighter airframe materials and more efficient generators and motors are expected to bring electric planes closer to practicality.

Another technical challenge for electric aircraft is the management of its power electronics, where the distribution of generators and loads on an isolated aircraft can be considered a microgrid. An electric aircraft with on-board power generation will require an efficient power distribution system. Effective management of this

microgrid will lead to weight savings since oversized generators can be avoided.

Giampaolo Buticchi and colleagues at the University of Nottingham Ningbo China, Kiel University and the University of Nottingham have now demonstrated an online load identification strategy for aircraft employing direct current (d.c.) power systems. The researchers are able to monitor the load behaviour by studying small perturbations in voltage references of the d.c. bus in response to voltage variations in their test grid. This information is then used in their algorithm to manage the power consumption of the grid.

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