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An Overview on Future Challenges of Aerodynamic Configuration Design for Distributed Propulsion Air Vehicle

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Distributed propulsion system (DPS) is used with a number of small engines distributed installation on the aircraft instead of concentrated installation of few (usually 2 to 4) large ones, and improves the propulsion efficiency by distributing exhaust and filling the wake behind the air vehicle. It also alleviates the high performance requirements and difficulty to design and manufacture large engine. This paper introduces concepts and principles of distributed propulsion vehicle, especially the developing trend and technical challenges of aerodynamic configuration design in the future are emphasized.

The key factors to be considered in this overview are: the propulsion efficiency, aerodynamic performance, the effect of boundary layer ingestion on fuel efficiency and active flow control to reduce distortion of inlet flow, shape optimization method of distributed propulsion air vehicle design.