

Advanced Controls Simulation and Design Laboratory

The SmartFan is a small-scale propulsion testbed representative of electric engines used in many electrified aircraft propulsion applications.

- 200-W, 12,000-rpm single-stage axial fan achieves 0.28 lbm/s mass flow rate and 1.04 pressure ratio.
- 48-V power supply with two 2.5 F supercapacitors enables high-bandwidth fan speed control.
- Linear actuator controls mass flow plug position creating a responsive, variable-area fan nozzle.
- Real-time computer/field-programmable gate array enables high-rate signal processing and testing of advanced control algorithms.
- Leverages hardware from Quiet Space Fan efforts for low-noise spacecraft cabin ventilation.

SmartFan System Diagram

