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Call for Papers for the Special Session on

Health and Usage Monitoring Systems (HUMS)–Driven Predictive Maintenance for Urban and Advanced Air Mobility

Organized and co-chaired by

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Technical Outline of the Session and Topics

Urban and Advanced Air Mobility (UAM/AAM) is transforming aviation through highly automated, low-altitude passenger and cargo transport, where safety, reliability, and cost-effective maintenance are critical for certification and large-scale deployment. Health and Usage Monitoring Systems (HUMS), combined with predictive maintenance and data-driven analytics, enable continuous health assessment, early fault detection, and reliable prognostics, supporting a shift from scheduled to condition-based maintenance. This special session focuses on advanced HUMS-driven solutions for UAM/AAM, emphasizing electric propulsion, flight-critical actuators, autonomous control, and safety management, while addressing recent advances, key challenges, and future research directions.

Topics of the session include, but are not limited to:

- HUMS architectures and sensor technologies for UAM/AAM platforms.
- AI- and machine learning-based predictive maintenance using HUMS data.
- Advanced diagnostics and prognostics of electric propulsion systems, motors, and drives.
- Condition monitoring and health assessment of actuators and flight-critical subsystems.
- Predictive analytics to support adaptive flight control and autonomy.
- Integration of HUMS with Safety Management Systems (SMS).
- Digital twins and cyber-physical systems for HUMS-enabled maintenance.
- Uncertainty quantification and risk-aware maintenance decision-making.

Timeline for Authors

All the instructions for paper submission are available on the conference website. Please visit www.iecon2026.org or scan the QR code for the timeline.