Advanced UAV-Based Measurement & RF Verification for ATM / CNS Infrastructures

aeroXess — Access to Airspace

HTWK — Leipzig University of Applied Sciences

Overview

The AeroXess research laboratory at HTWK Leipzig specializes in high-precision airborne electromagnetic field measurements using custom-equipped Unmanned Aerial Vehicles (UAVs). We provide innovative, high-resolution solutions for validating navigation, communication, and surveillance systems—offering a flexible, cost-effective complement or alternative to classical flight inspection. We are always interested in research, just reach out.

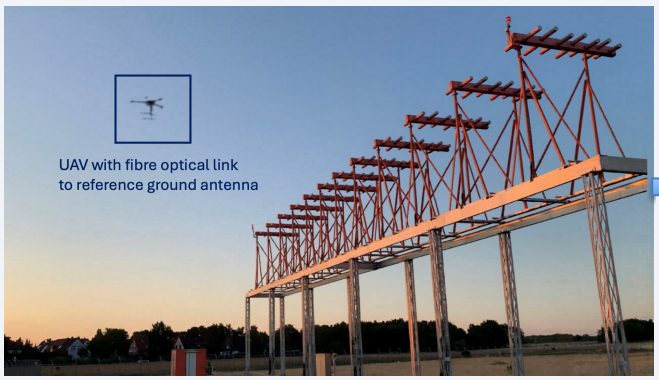
Core Capabilities & ATM Applications

- **Airport Navigation System Verification (ILS & Beyond):**
  High-resolution near-field and far-field measurement of ground-based navigation aids (e.g., ILS Localizer / Glide Path). Enables early anomaly detection and precise signal quality assessment without disrupting active air traffic.
- **Over-Sized & Very Low Frequency (VLF) Antenna Characterization:**
  In-situ 3D radiation pattern mapping for large or fixed antenna structures that exceed traditional absorber chamber capacities.
- **In-Air EMC & Interference Hunting:**
  Airborne signal tracking, spectrum inspection, and Electromagnetic Compatibility (EMC) mapping to locate and resolve RF interference source candidates in complex airport environments.
- **Customized Airborne Measurement Campaigns:**
  Tailored RF verification including radar coverage validation, specialized sensor payload integration, and customized aerial signal mapping.

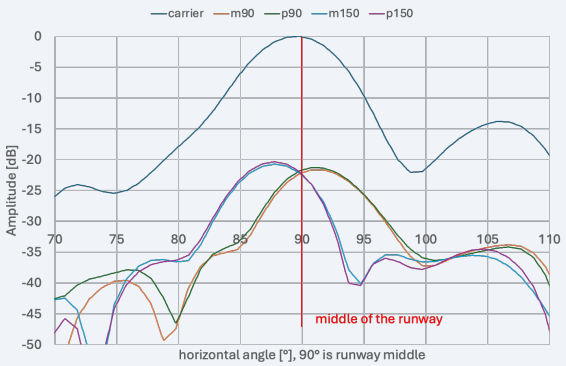
Why UAV-Based Inspection?

- **Centimeter Spatial Accuracy:** Integrated RTK-GNSS and high-precision telemetry for exact spatial mapping.
- **Unmatched Data Density:** Close-range scanning yields spatial data points impossible to obtain via conventional flight inspection aircraft.
- **Operational Efficiency:** Rapid deployment (<30min +15min flight) with minimal operational footprint, zero interruption to air traffic, and significantly reduced carbon emissions.

Visual Insights & Field Validation Data from the Navant-NG Project



flying UAV performing a near-field scan behind a ILS Localizer Array



carrier and sidebands of the ILS localizer array as results of the near-field-far-field-transform

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Exhibitor: AeroXess Laboratory | HTWK Leipzig – University of Applied Sciences
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