



Moog S-250 Vehicle Hover Test Update

Revolutionary Vertical Lift Technology Project
Advanced Air Vehicles Program

NASA Glenn Research Center

Brenda Henderson

Jordan Cluts

Alexander Svetgoff

Lennart Hultgren

David Elliott

Jeff Severino

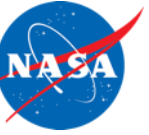
Moog

Justin Jantzen

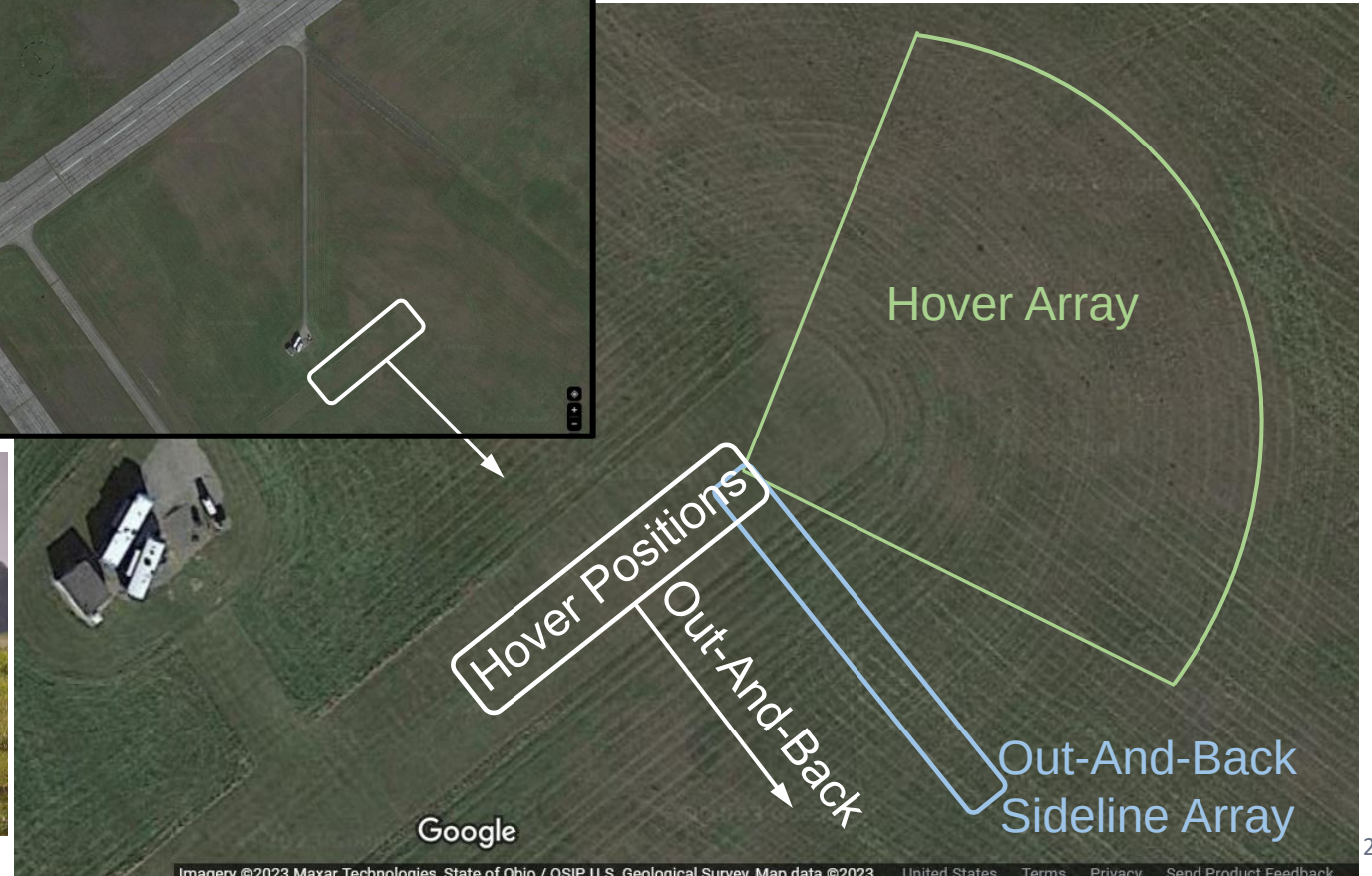
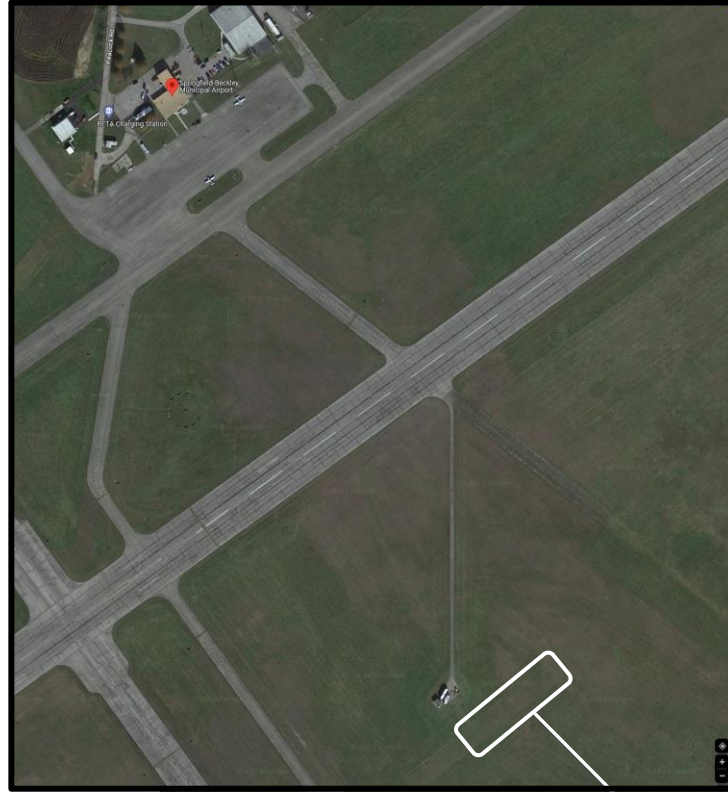
Jeff Bennett

Acoustics Technical Working Group
NASA Glenn Research Center
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Test Details



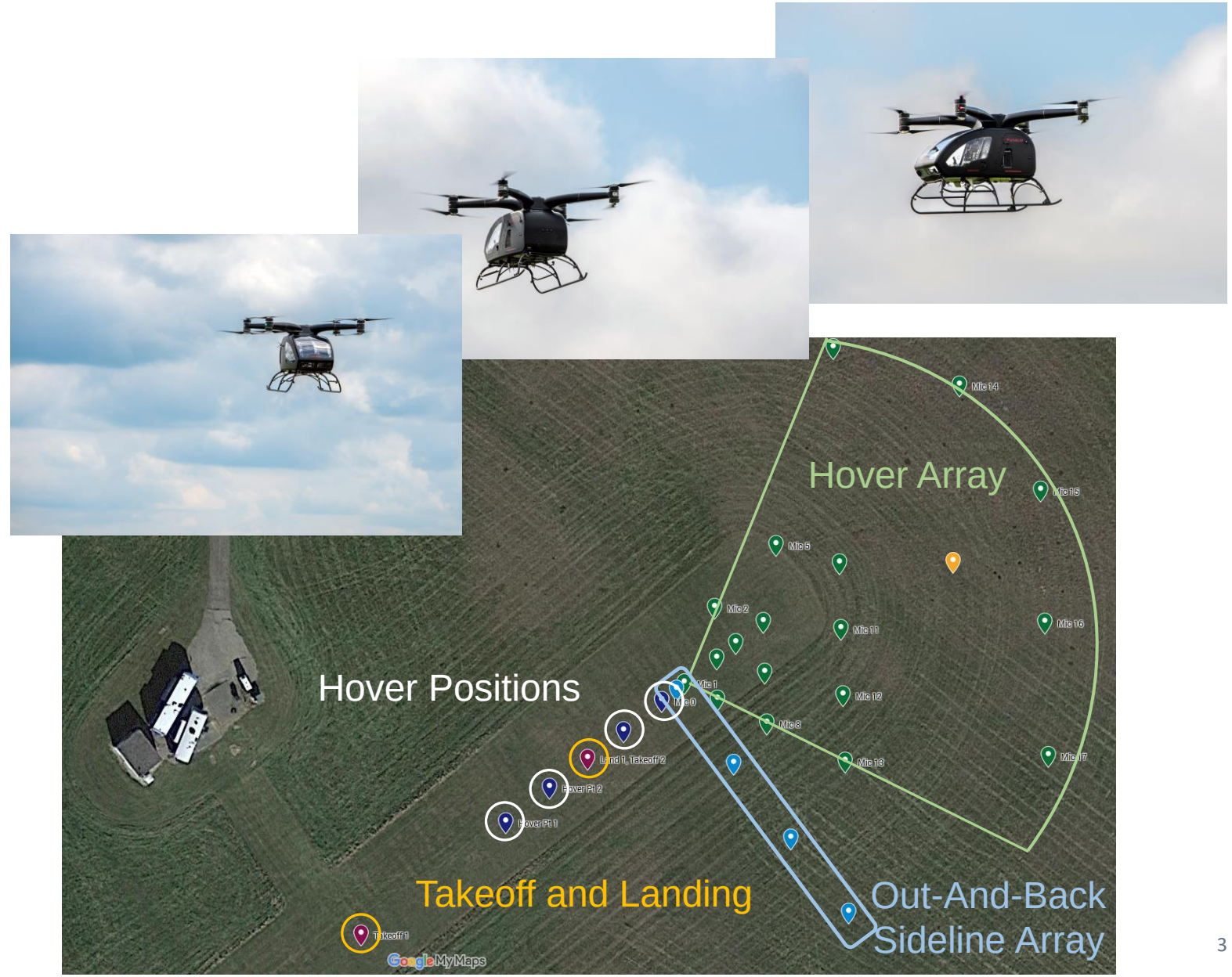
- Test date – 7/21/2023
- Springfield-Beckley Municipal Airport, UAM development area
 - Minimal air traffic
 - Background levels low relative to aircraft
- Maximum hover height – 60 ft
- Remotely piloted
- Ambient conditions
 - On-board pressure measurements
 - Temperature, humidity, pressure, and wind measured ~10 ft AGL
- Two flights
 - Hover
 - Out-and-back



Objectives



- 1) Identify the acoustic far field
 - Used subset of Hover Array
- 2) Obtain data to construct a noise hemisphere for prediction tool validation
 - Used all elements of Hover Array
- 3) Obtain out-and-back data for use in perceived noise studies
 - Used Sideline Array



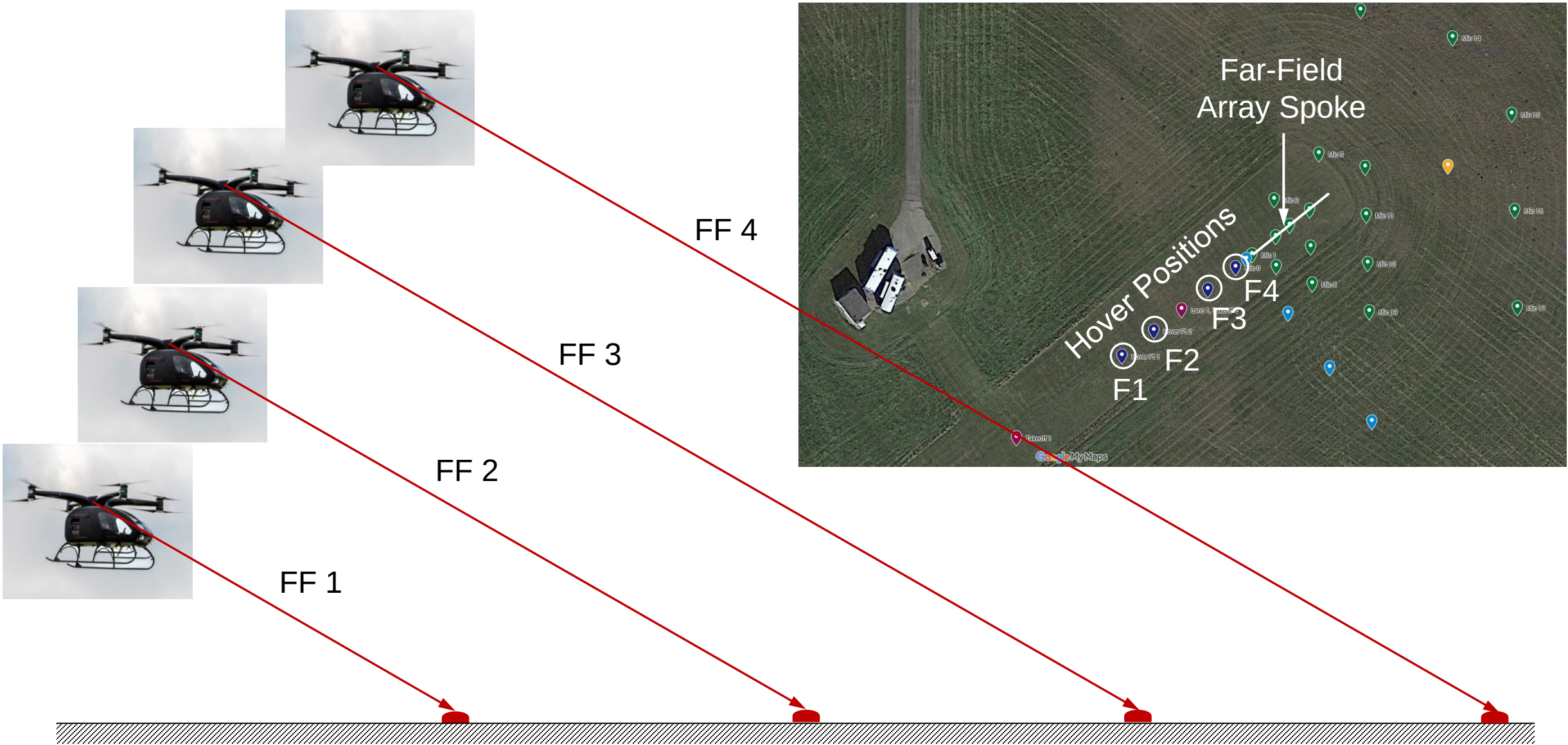
Approach



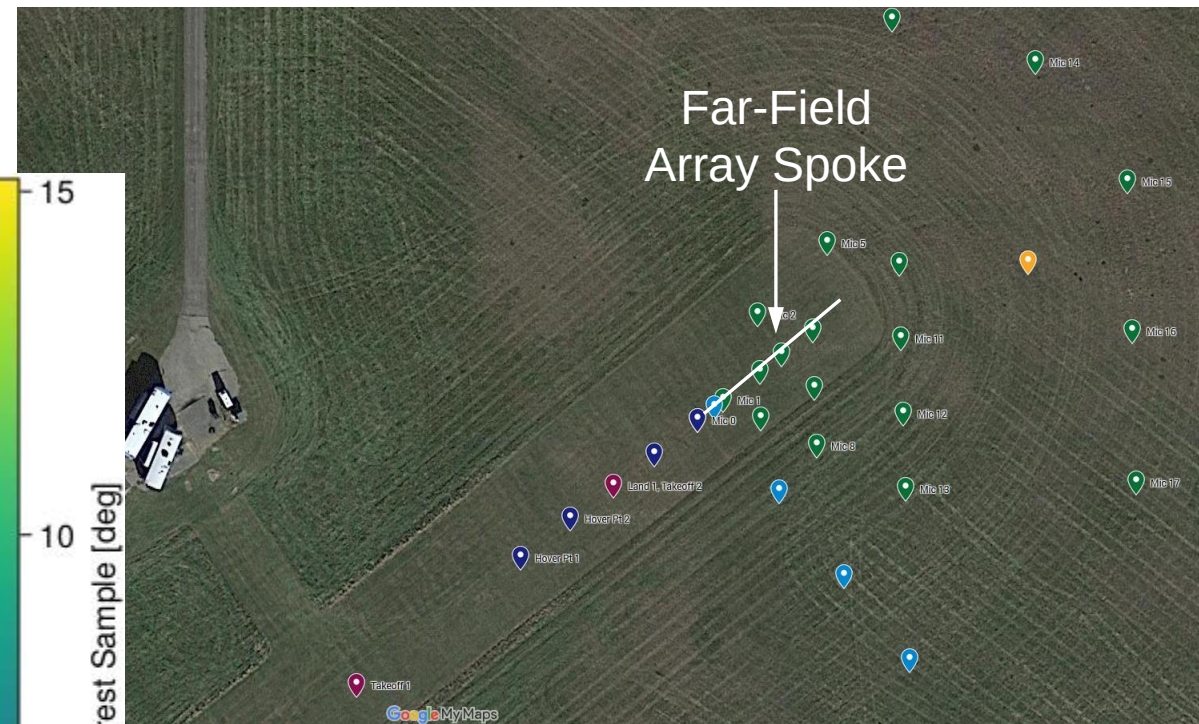
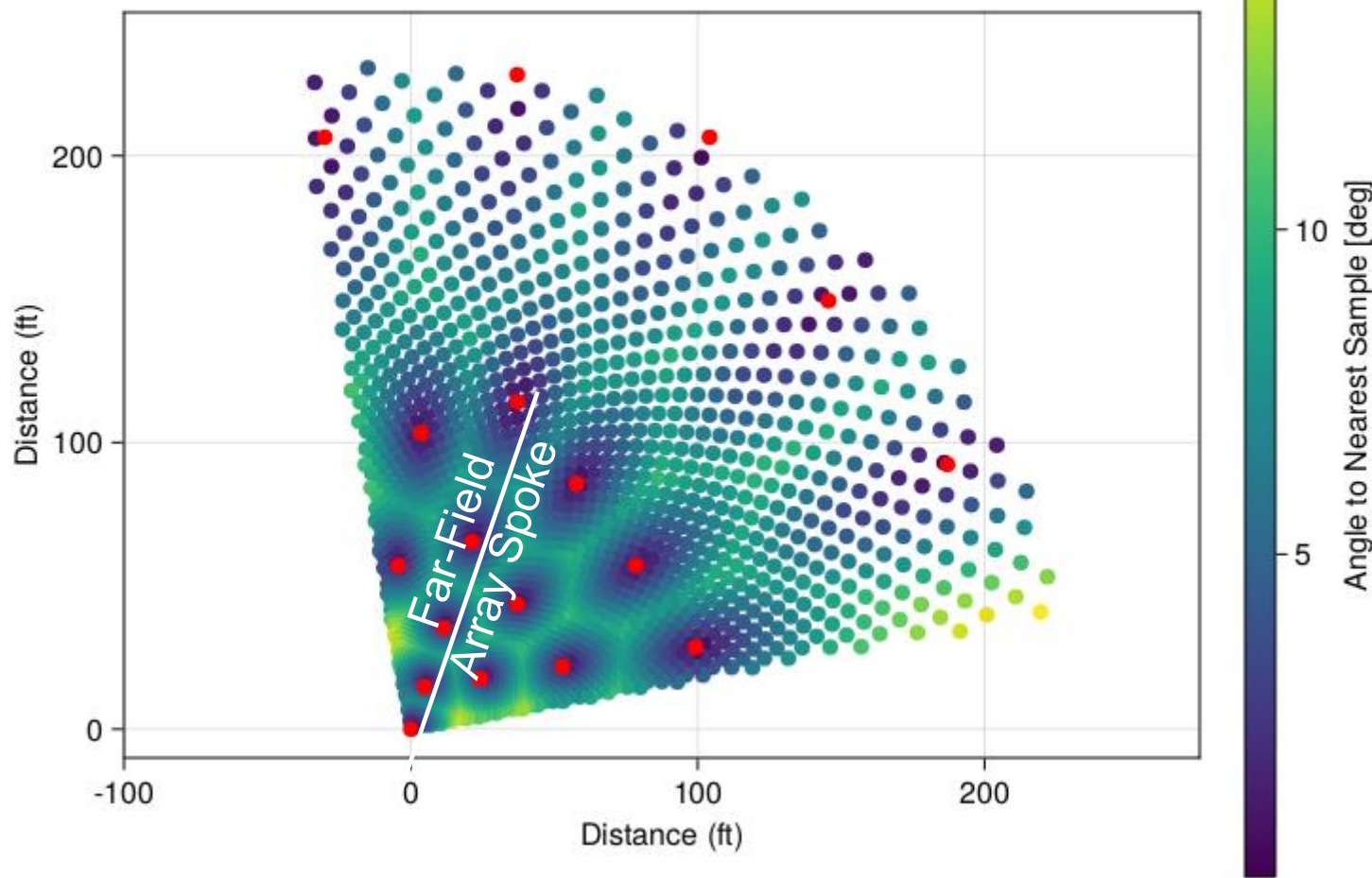
- Far-field determination
 - Vehicle positioned at four hover locations
 - Emission angle to a subset of microphones was maintained
 - Propagation distance varied
- Noise hemisphere construction
 - Custom array was designed to meet objectives
 - Vehicle rotated and held specified headings over origin
 - For each heading, array captured data over one quadrant of hemisphere
- Out-and-back data acquired with a four-element sideline array for a combined take-off and landing maneuver



Far-Field Operations

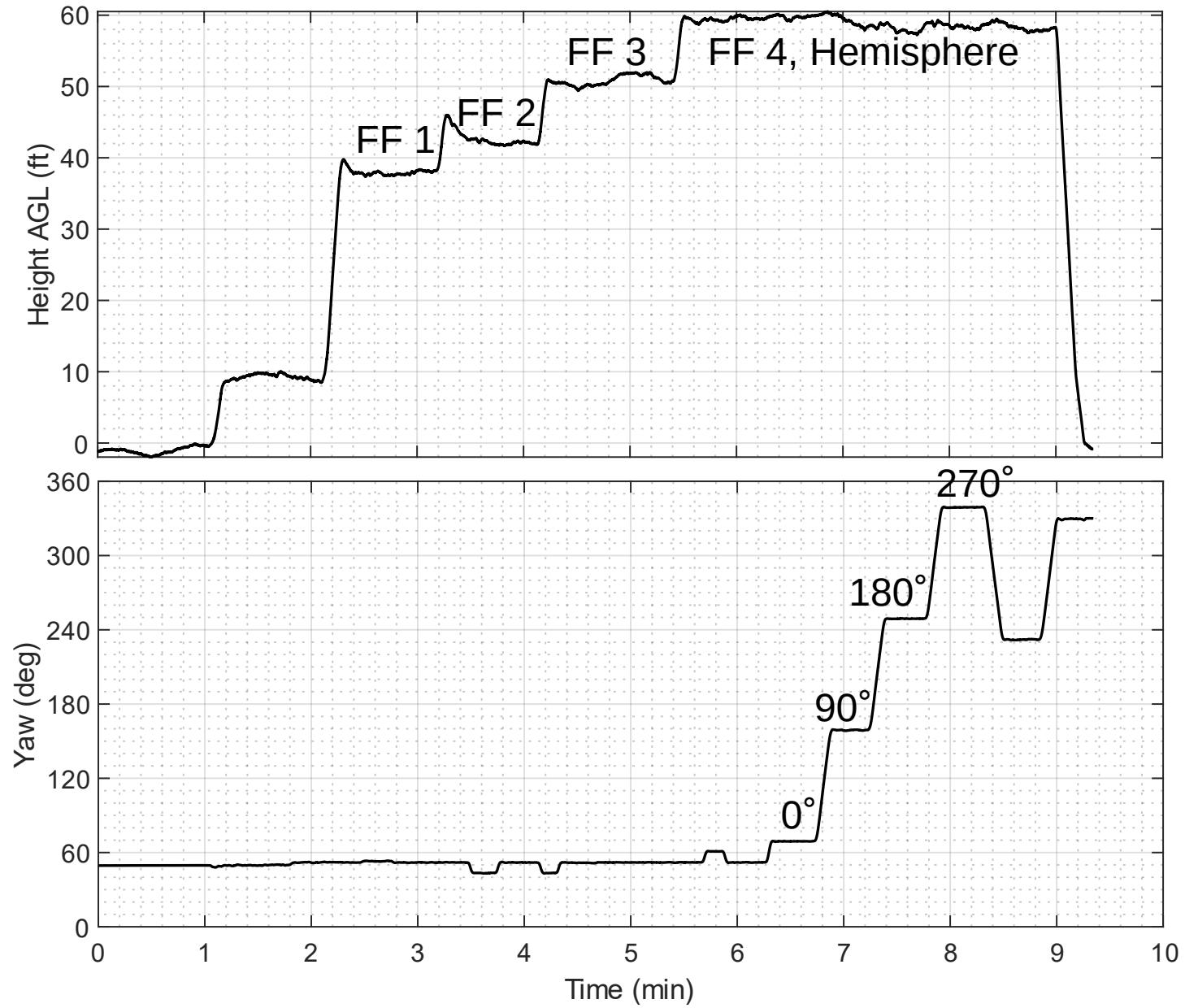


Hover Array



14.5° Declination
Angle from Horizon

Telemetry



Future Plan



- Process and report far-field results
- Depropagate sound to surface of hemisphere and report sound pressure levels as a function of hemisphere coordinates
- Report necessary aircraft telemetry (motor RPM)
- Release out-and-back acoustic data files
- Complete noise predictions
- Release rotor surface geometry files
- Release details of array construction
- Combine hover test results with previous electric motor results planned for publication at AIAA/CEAS Aeroacoustics in June 2024

