Jülich Institute – Fieldship UAV blimp

Peter Lobner, 19 June 2023

The 10-meter (32.8-ft) Fieldship unmanned aerial vehicle (UAV) blimp operated by the Jülich Institute was acquired in 2013 to serve as a remote sensing platform for a variety of studies, many led by the Institute of Bio- and Geosciences (IBG-2) and dealing with plant sciences. The Fieldship is stored and operated at the Campus Klein-Altendorf near to Bonn.

The Fieldship blimp enables surveillance of agricultural areas for long periods of time. The smooth flight characteristics with low vibrations make the UAV blimp a good platform for carrying remote sensing instrumentation packages that complement the remote sensing capabilities of other types of small UAV platforms used by Jülich Institute (i.e., quad-copters).

Jülich Fieldship UAV blimp in low-level flight.
Source: Jülich Institute

Since its acquisition, the Fieldship has been significantly improved with the addition of an autopilot to enable semi-autonomous operations.

General characteristics of the Jülich Fieldship UAV blimp

Parameter	Fieldship UAV blimp
Type	Non-rigid, pressure stabilized hull
Length	10 meters (32.8 ft)
Diameter, max	About 3.2 meters (10.0 ft)
Lifting gas	Helium
Volume	24m³ (848 ft³)
Payload capacity	5 kg (11 lb)
Power source	Batteries
Propulsion	Two x 1 kW (1.4 hp) brushless electric motor driven propellers, cantilevered from the small gondola
Endurance	60 minutes

Jülich Fieldship UAV blimp. Source: Jülich Institute

Agricultural areas and specific experiments recorded using the UAV blimp platform at multiple times during the 2017 growing season. Source: Jülich Institute

For more information

- "Field investigations from the air with unmanned aerial vehicles (UAV's)," Jülich Institute, 2017: https://www.fz-juelich.de/ibg/ibg-2/EN/Research/ResearchGroups/shoot_dynamics/technologies/UAV/UAV_node.html

- “Analysis of fields from the top with unmanned air vehicles (UAV's),” Jülich Institute: https://www.fz-juelich.de/ibg/ibg-2/EN/methods_jppc/UAV_ZeppOcto/_node.html
- F. Fiorani, et al., “Opportunities and challenges for the development of a European plant phenotyping research infrastructure,” Jülich Institute, Institute of Bio- and Geosciences (IBG-2), Jülich Plant Phenotyping Center, 2016: http://www.trees4future.eu/uploads/Final%20conference/Presentations/Session1/2%20-%20Fiorani.pdf

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