INTEGRATION OF RADIOMETER IN UAS FOR RESEARCH

INTA-Universidad de León

Ana Corrales Sierra
Neves Seoane Vieira
Laura López Campano
Eduardo García Ortega
María Parrondo
José Luis Sánchez
Rafael González Armengod
Bartolomé Marqués Balaguer

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CIAR
(Centro de Investigación Aeroportada de Rozas)

- Objectives:
  - Train UAS to fly in Airspace
  - Benefits of UAS in the civil field
  - Promoting technological development
  - Promoting industrial development
  - Promoting Innovation
  - international collaboration
  - Knowledge Dissemination
  - Development of standards for UAS

- Approximated size:
  - 4x3km

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CIAR
- Description
- Refurbishment
- Activity

ALO
- Description
- Capability

Equipment
- Description

Results
- Runway
- Landscape
- Infrastructure

Conclusion

- Adaptation:
  - Control Tower
  - Building for offices, laboratories…
  - Urbanization, parking…
  - Hangar, platform,
  - Runway
  - Fence
- General Services:
  - Fuel
  - Fire extinguish
  - Equipment:
    - APU
    - UHF and VHF
    - Radar
    - Meteorological Station
    - GPS differential
  - Communications and navigation

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- Flights with **UAS**
  - Certification flights
  - Instrumentation integration in UAS.
  - Flights as a Aerial Platform for Research

- In CIAR we are doing the following activities:
  - Flights for the development of SIVA
  - Flights for the development of Atlante (CASSIDIAN)
  - Flights for the development of ALO
  - Flights for development and verification for Fly-tech, in collaboration with Civil Aviation.
  - Flights for the development of helicopter UAV TEKPLUS

ALO

- Lightweight system
- Short to medium range,
- Composed of three UAVs and a mobile station

ALO

	ALO	SIVA	MILANO	DIANA
Length	2.33m	4.03m	8.52m	3,47 m
Wing span	3.48m	5.81m	12.5m	1,84 m
Height	0.98m	1.03 m	1.44m	0,67 m
MTOW	55 kg	300kg	900kg	160 kg
MPL	4 kg	50 kg	150 kg	20 kg
Vmax	180 km/h	190 km/h	230 km/h	800 km/h
V cruise	115 km/h	115 km/h	575 km/h	720 km/h
Autonomy	8h	7h	+20h	1 h
Scope (Data link)	100 km	150 km	2000 km	100 km
Flight roof	4270m	4270m	7500m	8000m

- Missions: reconnaissance, surveillance and target acquisition.
- Low cost and maintenance
- Easily operable
- Capable of performing autonomous missions with a short time-to-flight.
- The system has an Experimental Airworthiness Certificate (CAE).

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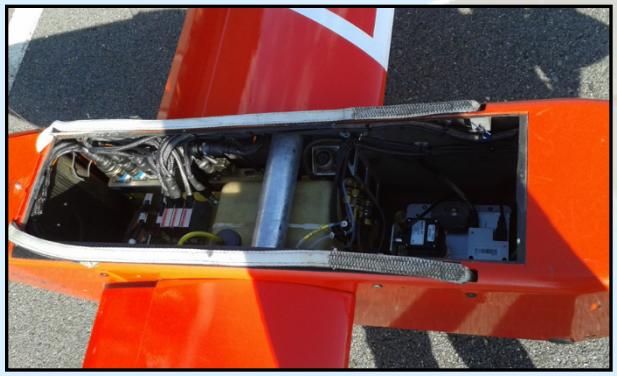
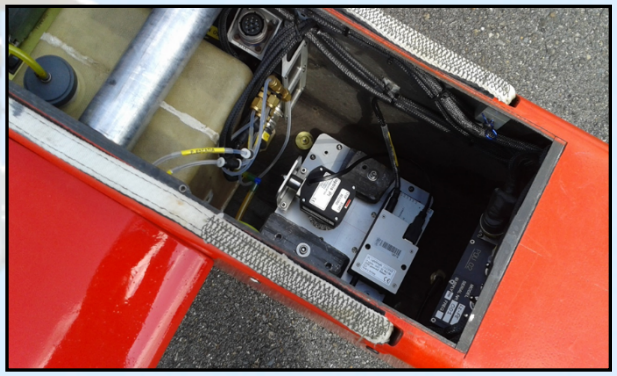
- The Atmospheric Physics Group of the University of León, Spain, has a lightweight OPTRIS radiometric camera (220g),
- Spectral measurements in the 7.5 to 13 micrometre range
  - Resolution of 382x288 pixels
  - FOV of 38º X 29º
  - Precision of 0.04K with 38ºC (311,15K).





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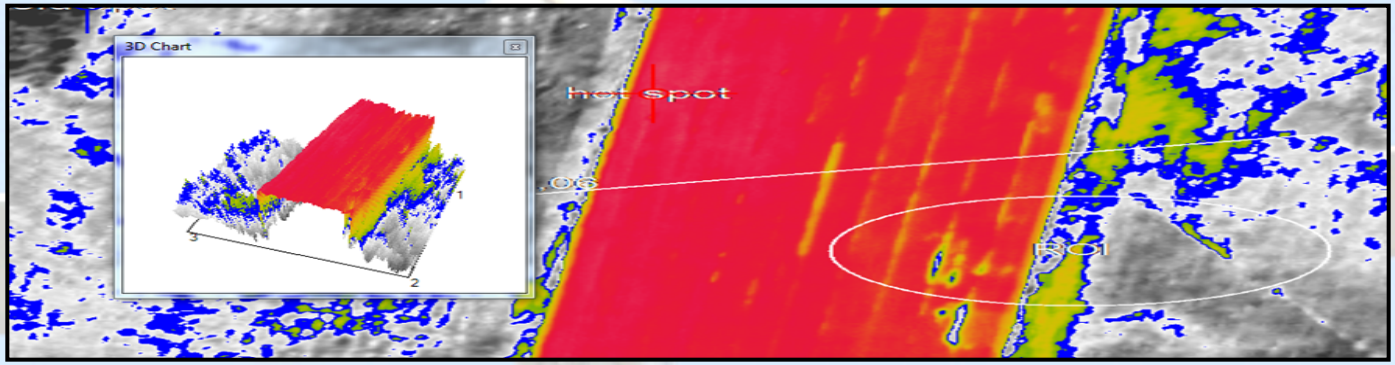
- Radiometric measurements on the track. Lower values indicate the presence of water on the asphalt



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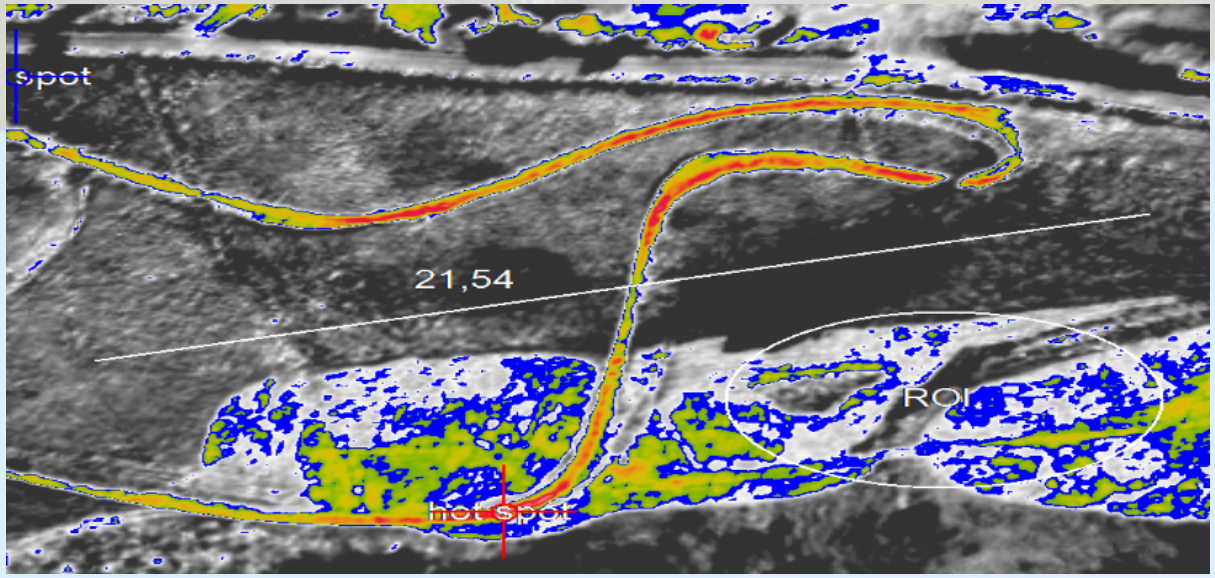
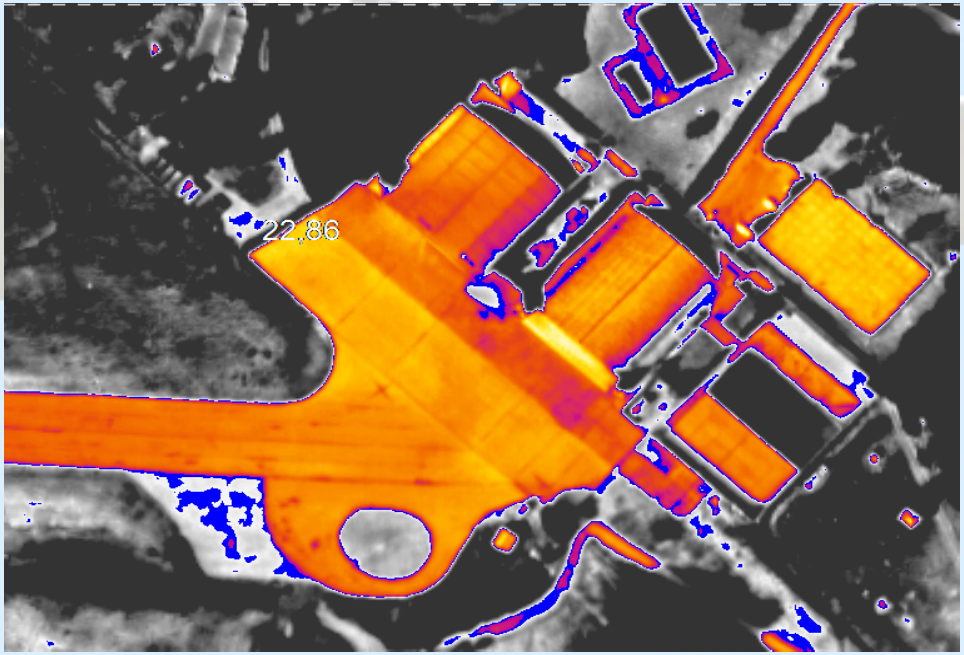
- Radiometric measurements. The high values show an un-asphalted road, while the lowest values indicate the presence of accumulations of water in the farmland close to the runway.



- Radiometric Measurements on the infrastructures



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- The use of UAS for these measurements allows the comparison of the three sources of data (ground, satellite and UAS) being cardinal to the study of the radiative properties of each kind of clouds.

Thank you

Contact or additional information:

- Ana Corrales Sierra ana.co.si@gmail.com
- Neves Seoane Vieira nevesseoane@gmail.com
- Laura López Campano laura.lopez@unileon.es
- Eduardo García Ortega eduardo.garcía@unileon.e
- María Parrondo parrondosc@inta.es
- José Luis Sánchez jl.sanchez@unileon.es
- Rafael González Armengod gonzalezr@inta.es
- Bartolomé Marqués Balaguer marquesb@inta.es