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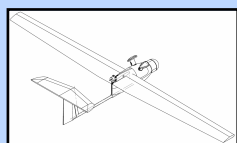
## Objet Volant Léger Instrumenté

### Turbulences Atmosphérique

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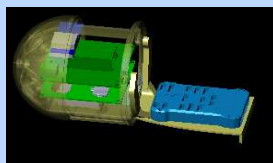
#### Objectives:

- Frequent and 'flexible' sounding of the low troposphere (average meteorological variables)
- Turbulence measurements, for estimation of turbulent flux, and studies of the fine scale processes (surface/atmosphere processes, entrainment, cloud/atmosphere/surface interaction, micrometeorology)



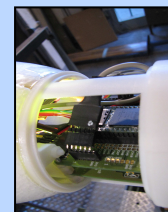
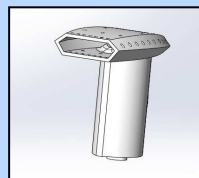
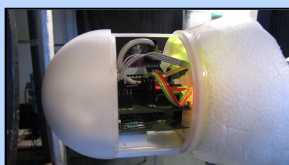
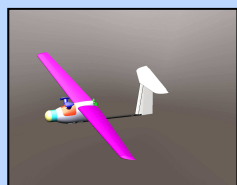
#### Airplane:

- Based on Techpod (HobbyUAV)
- 2.5 kg of weight
- 2.6 meters of wingspan
- Electrical propulsion
- PixHawk Autopilot



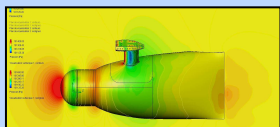
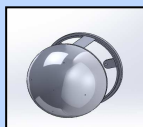
#### Sensors:

- Temperature/humidity sensors (10 Hz)
- 3D Wind sensors (20 Hz)
- Attitude measurement by IMU (100 Hz)
- GPS (5 Hz)



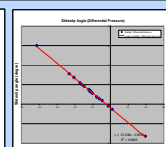
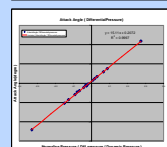
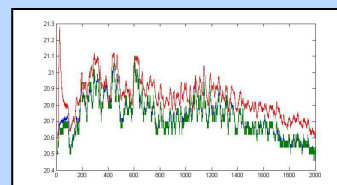
#### Wind Sensor:

- 5-holes spherical probe
- Low cost – Made by a 3D printer
- Easy calibration
- Measure of wind direction by difference of pressure in each hole



#### Wind Tunnel Test:

- Calibration of the wind sensor
- Analysis of the hoods effect in temperature measurement



#### Flight tests:

- Made in 05/06/2014 at CRA Lannemezan
- 4 flights
  - Takeoff weight of 2.2 kg (400g of battery)
  - Duration of 10, 15, 36 and 24 minutes
- Mission simulation and performance test



#### Results:

- Very stable flight
- Good autopilot response
- 2 hours of maximum autonomy
- Speed range: 8 – 16 m/s
- Maximum vertical speed: 10 m/s

