



# Contribution of French research teams to ADM Cal/Val

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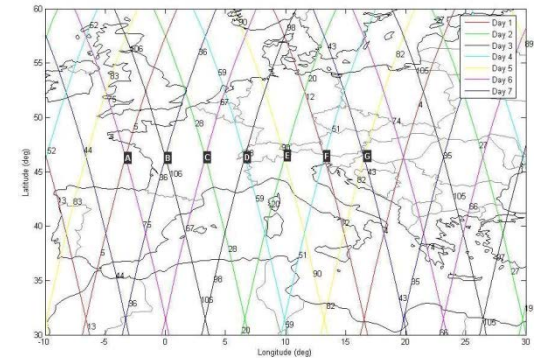
# Proposal objectives

Combination of 5 actions:

1. Measurement of aerosol and wind profiles at a cross-point of ascending and descending orbits during one month.
2. Flights of the airborne high-spectral-resolution lidar LNG along the flight track (some of them coordinated with 1., others with the A2D).
3. Operations of the high-power, Mie-Rayleigh lidars at La Réunion and Haute-Provence observatories during 2-months. Measurements of wind profiles as high as 40km.
4. Measurements of winds in the low stratosphere with high-altitude, equatorial balloons of STRATEOLE-2 research campaign (5 flights in 2018, 20 flights in 2020).
5. Assimilation of wind data with Météo-France global model → continuous monitoring of data quality throughout mission lifetime.

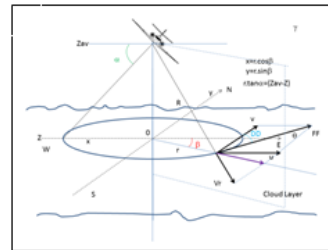
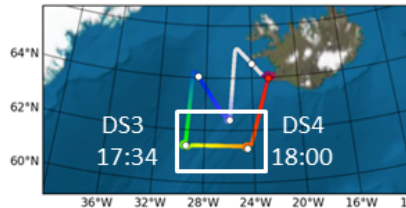
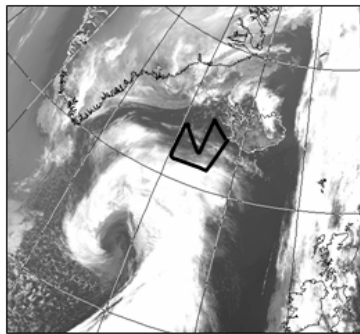
# Description of CAL/VAL techniques applied

- Mobile site at orbit cross-point
  - At least one Raman lidar (aerosol backscatter and extinction, depolarization, temperature), one UHF wind profiler (wind profiles up to 4 or 5km) and radiosoundings.
  - Depending of resources, possible addition of wind lidar.
  - Site operated during one month in May-June 2018. Up to 8 overpasses expected.
  - Ground measurements used for verifying the radiometric budget of AEOLUS and first assessment of data quality
- Flights of the high-spectral resolution lidar LNG:
  - Measuring aerosol backscatter, extinction, depolarization and winds.
  - Flights to be coordinated with mobile site and A2D.
  - Assessment of AEOLUS data quality with the impact of wind and aerosol variability.

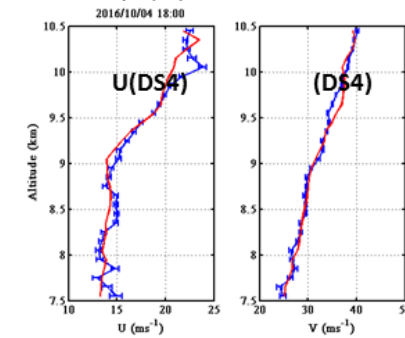
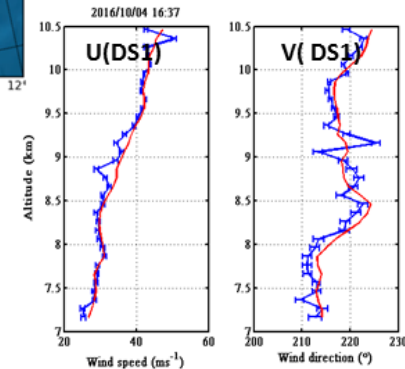
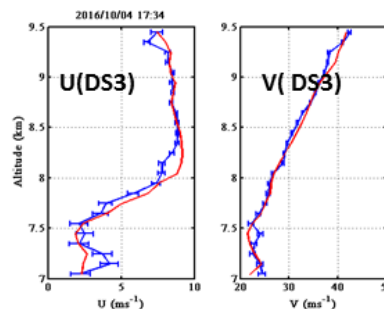
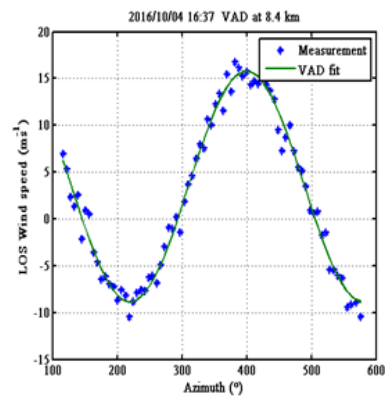


# Description of CAL/VAL techniques applied

LNG Flight October 3rd

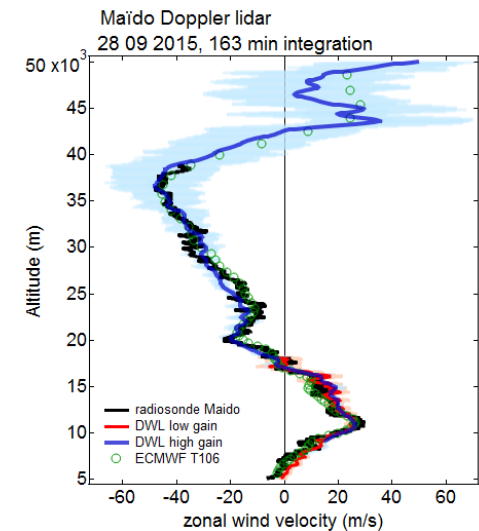


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# Description of CAL/VAL techniques applied

- Operation of high-power Rayleigh lidars at La Réunion (Indian Ocean) and Haute-Provence (French Alps):
  - Measurement of wind profiles up to 40km with lidars implementing the same dual Fabry-Perot technique as AEOLUS.
  - Three months, starting as early as Spring for La Réunion, followed by Haute-Provence later in the year.
- Stratospheric balloons
  - Stratospheric balloons will be launched by CNES in the equatorial band in 2018 and 2020 in the frame of the Strateole-2 campaign.
  - Flights typically last 2 to 3 months.
  - Winds will be measured in the equatorial band at about 20km altitude. 300 coincident measurements in 2018.



# Contribution to Aeolus CAL/VAL requirements



- Detailed analysis of AEOLUS sensitivity and first assessment of wind and aerosol products with the mobile station.
- Assessment of the quality of wind and aerosol products with LNG on a limited number of flights.
- Statistical analysis of wind products with La Réunion and Haute-Provence observatories.
- Quality of wind measurement at high-altitude in the equatorial band with stratospheric balloons.
- Long term monitoring of wind product quality.

# Status of manpower, tools and funding

- Cal/Val actions supported by CNES.
- CNES funds received these last years has been used for the preparation/improvement of the instruments.
- Funding for cal/val campaigns will be limited → number of LNG flight hours will depend on extra funding.
- Large part of the manpower is secured. Additional non-permanent staff to be recruited later this year.
- Instruments ready. Analysis tools to be developed/refined this year.

## Next steps

- Proposal submitted to CNES in April.
- Experiment plan to be written this year.
- Location of mobile site to be found once the satellite is in space (end 2017/early 2018).
- Analysis tools to be refined.