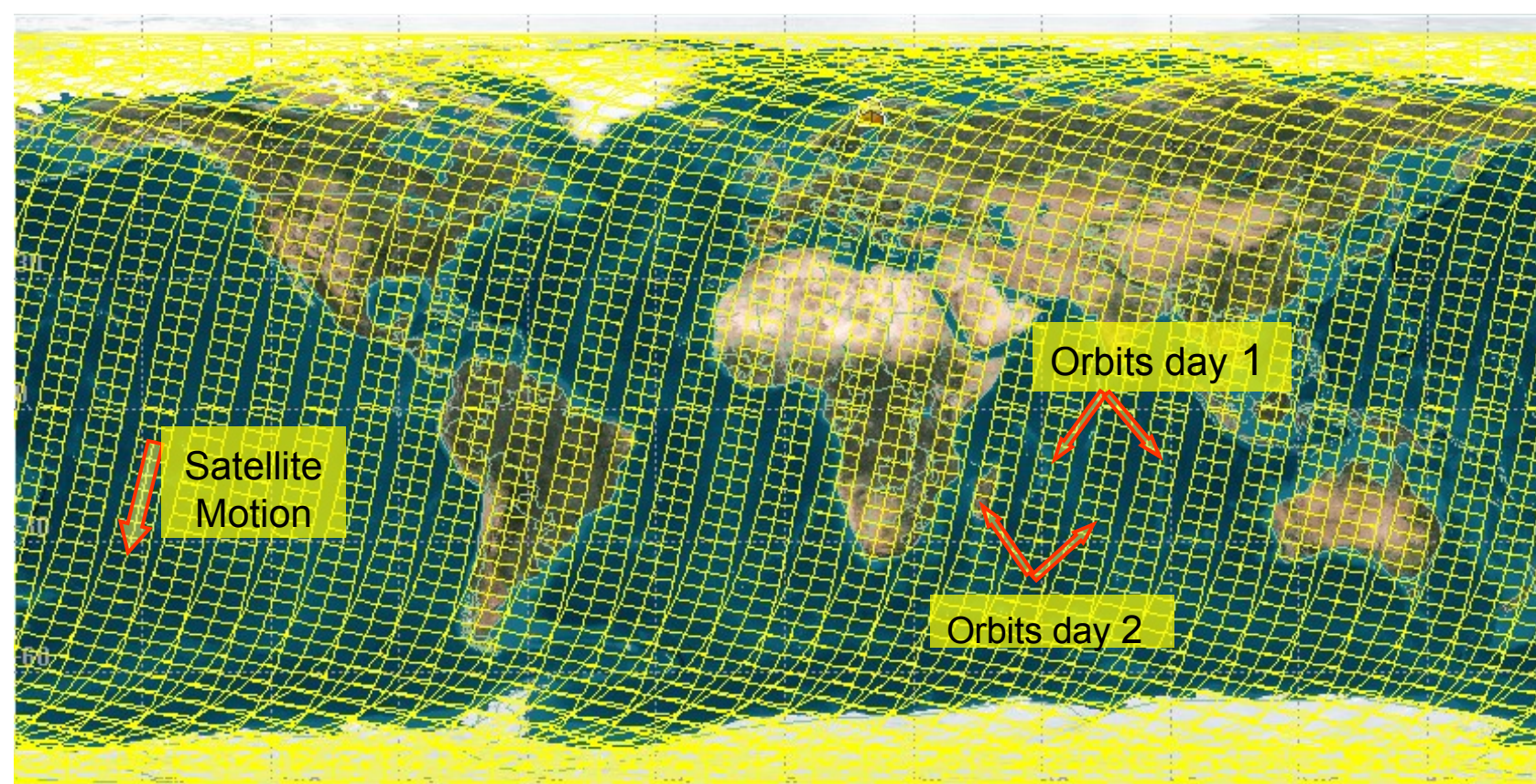


Venus Mission

Systematic and frequent observation of 50 sites around the world. Cooperation between Israel (ISA) and France (CNES).

- 10 m resolution
- Field of view : 27 km
- Revisit : 2 days
- Constant observation angles
- 12 spectral bands from 420 to 910 nm
- Launch in 2009



Accessible zones for all 29 orbits of Venus 2-day repeat cycle

Venus Products

Level 1 Product contains:

- Geo-referenced and registered
- Top of Atmosphere Reflectances

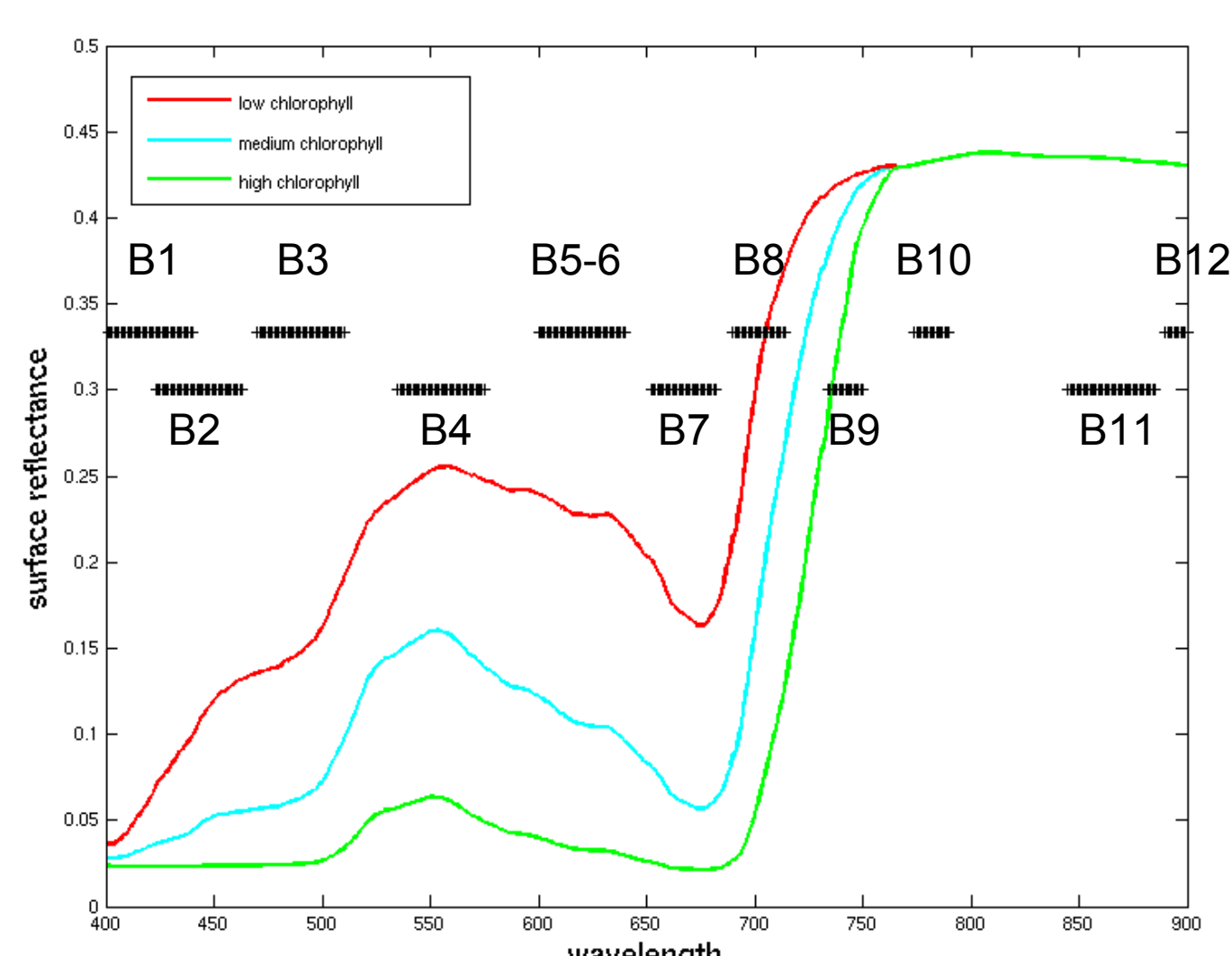
Level 2 Product contains :

- Surface reflectance after
- Cloud screening
- Atmospheric correction

Level 3 Product contains:

- Weekly synthesis of surface reflectances

Venus Spectral bands



Formosat 2 Mission

Taiwanese satellite (NSPO)

- 8 m resolution (Panchro 2m)
- Field of view : 24 km
- repetitivity : 1 day
- constant observation angles
- 4 spectral bands (488, 565, 650, 830 nm)
- Launched in may 2004

Data are distributed by SPOTIMAGE outside Taiwan and China



Retrieval of aerosol optical thickness using multi-date and constant viewing angle images from Formosat-2 and VENμS.

O.Hagolle^{1,2}, G.Dedieu^{1,2}, V. Debaecker, B.Mougenot²

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² CESBIO, Unité mixte CNES-CNRS-IRD-UPS, 18 avenue Edouard Belin, 31401 Toulouse Cedex 9, France

Method

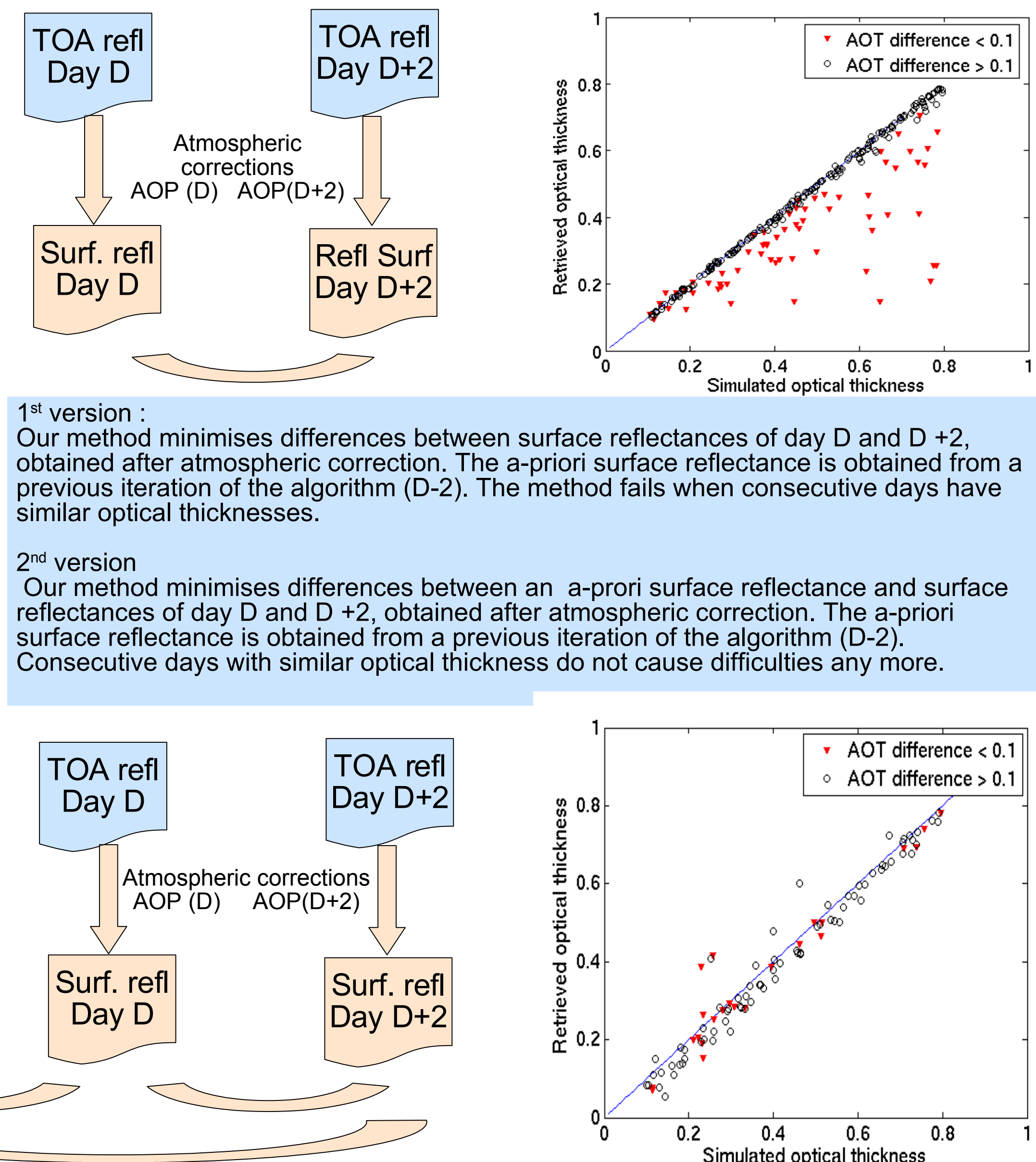
Hypotheses for Venus aerosol detection and corrections

- No directional effects on Venus time series
 - Thanks to constant viewing angles and constant local time
- Surface reflectance vary :
 - Quickly against distance
 - Slowly against time (with exceptions...)
- Aerosol optical properties (AOP) vary :
 - Quickly against time
 - Slowly with distance (uniformity over a few km)

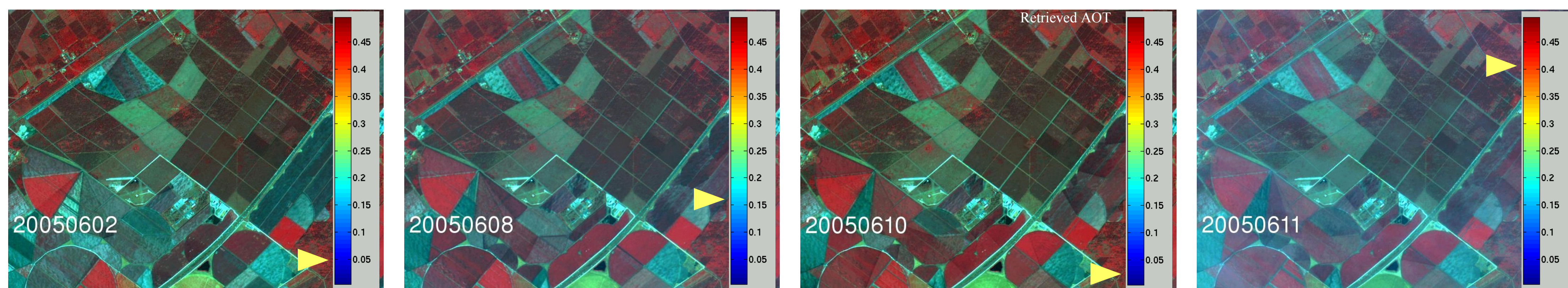
Quick variations of TOA reflectance ==> AOP variations

Current Implementation :

- Our method searches the AOPs of day D and D+2, such that:
 - Surface reflectances of day D and D+2 are closest.
- Fixed aerosol model : continental type
- Two spectral bands used for the inversion:
 - Blue and green bands : 488 nm, 565 nm
 - Red and NIR Surface reflectance are less stable
- Resolution 100m (to reduce noise)
 - 7*7 pixels are used for the inversion

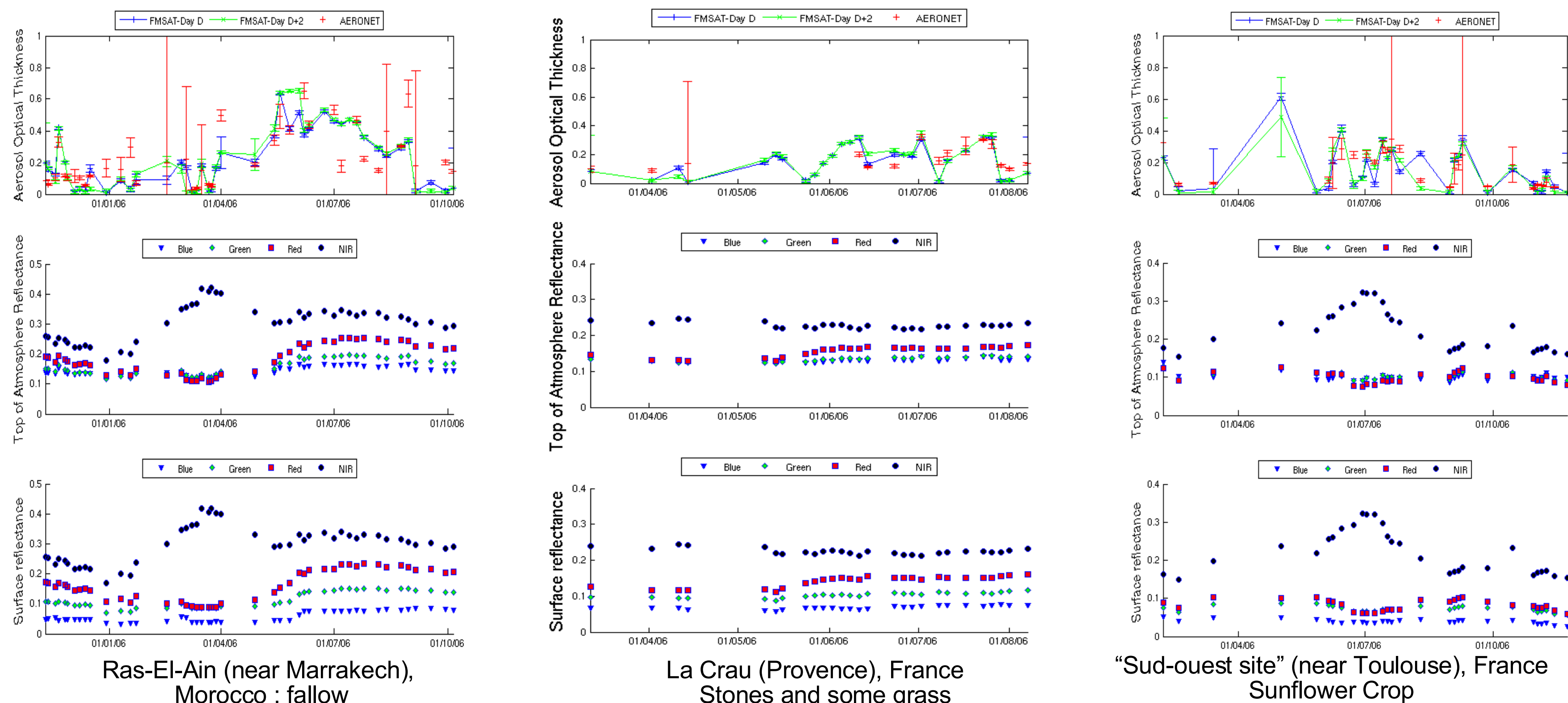


Results



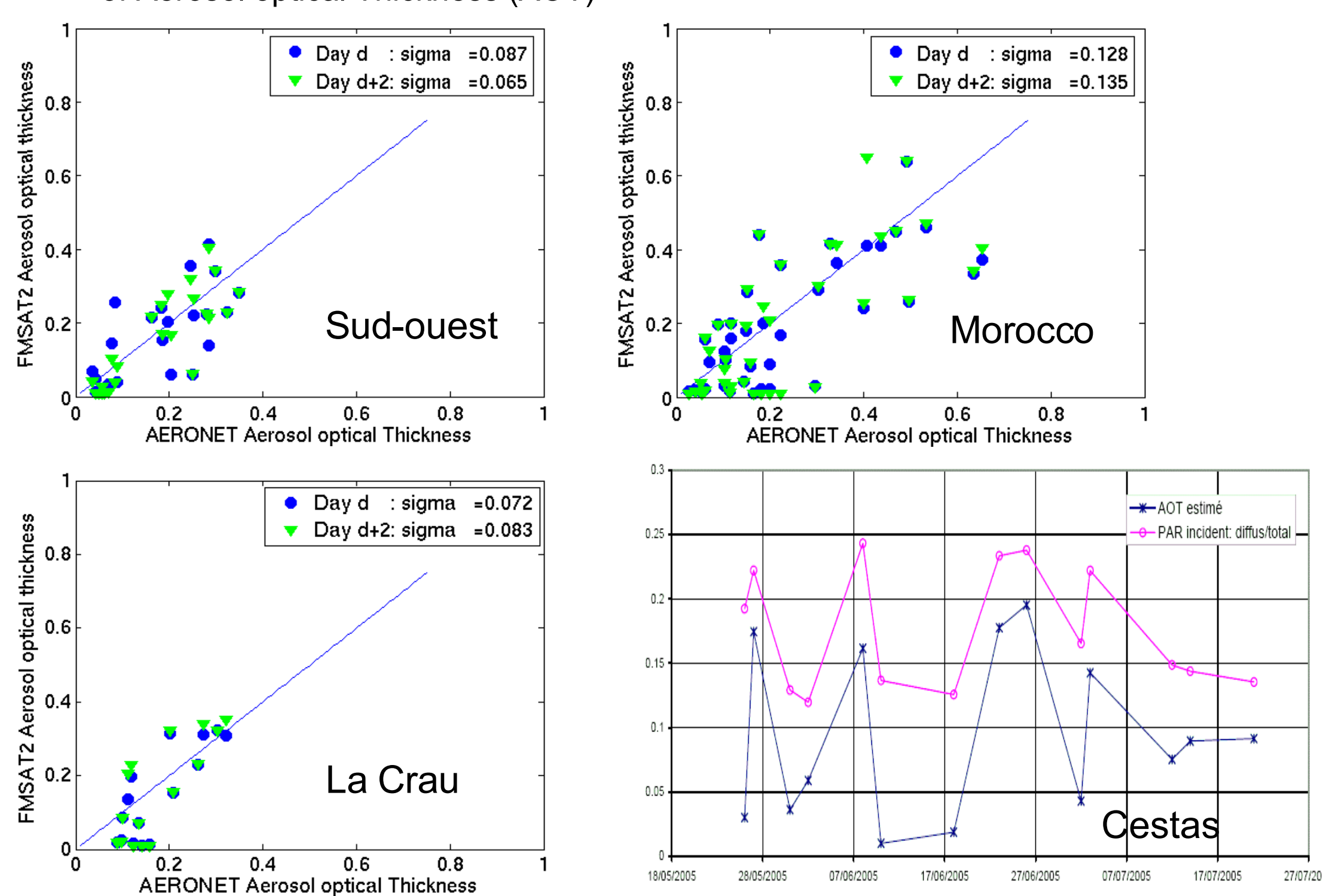
Formosat 2 data acquired with constant viewing angle. Site : Cestas, Southwest France
Constant Colour Composite in TOA reflectance.

The yellow cursor shows the Aerosol optical thickness estimated by our method



Validation of AOT

Comparison with AERONET estimates of Aerosol optical Thickness (AOT)



Comparison with Diffuse irradiance ratio measured by PAR sensors. Thanks to D. Guyon, INRA EPHYSE

Conclusions

- Work in Progress
 - Aerosol images nearly ready
- Good results for 3 very different sites
 - processed with the same parameters
- Nice surface reflectance time series
 - » Very smooth in all 4 spectral bands
- Good accuracy of optical thicknesses
 - Consistent with Aeronet measurements
- **Venus will provide high quality time series**
- **Aerosol estimates might be a by-product of Venus**

Acknowledgments :
Formosat 2 images © NSPO (2006)
distribution Spot Image S.A. all rights reserved
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