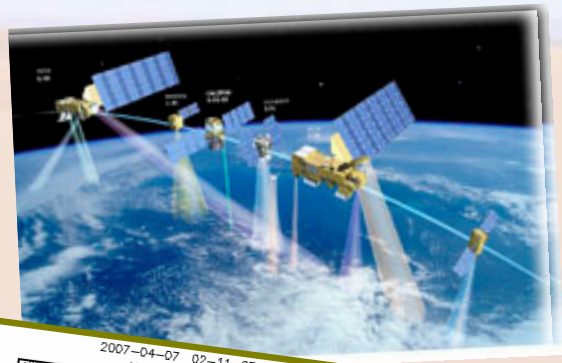
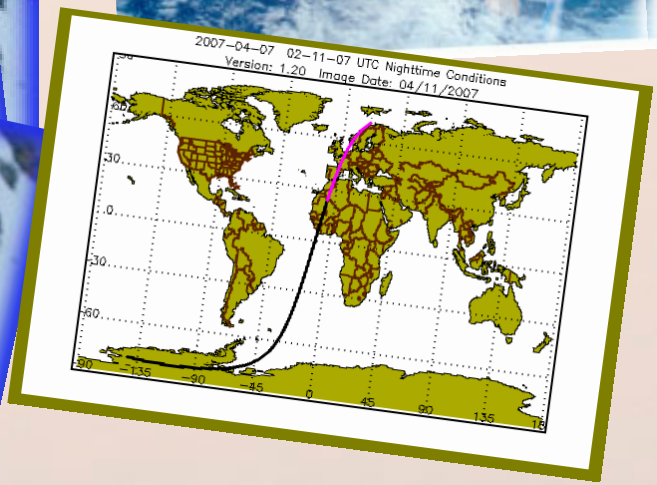
Bringing together ground and A train observations and measurements, to understand aerosols and clouds

Danielle de Staerke, Adrien Laurenceau, Annie Carrasset, Sylvie Dubreuilh, Eric Abgrall





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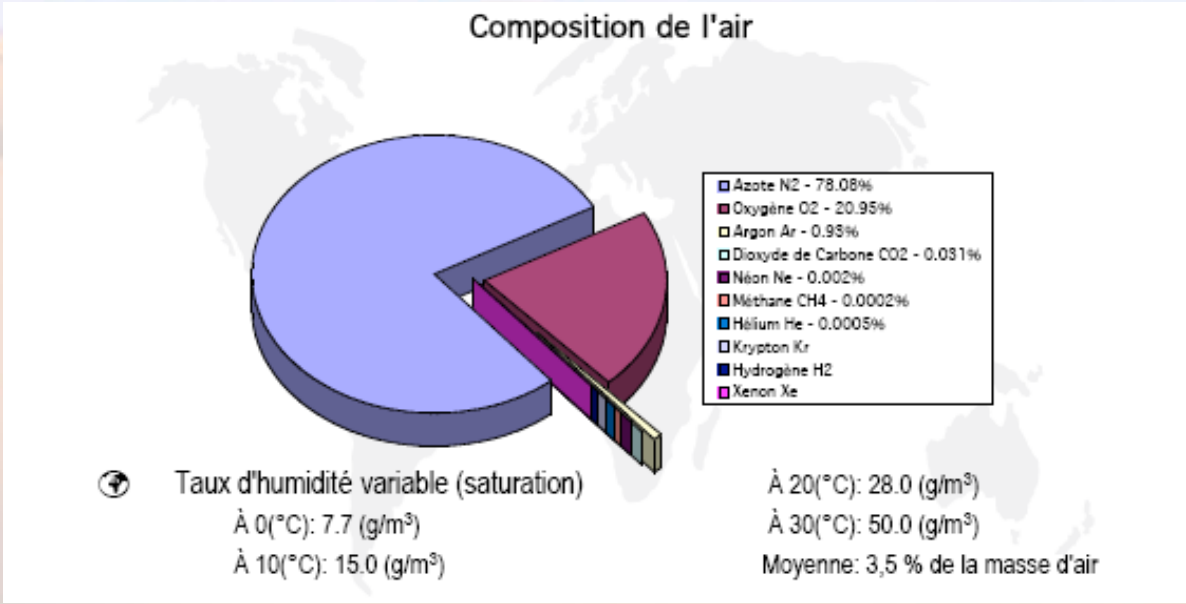
Earth atmosphere

A thin layer moving around the Earth

Components

- Gaz



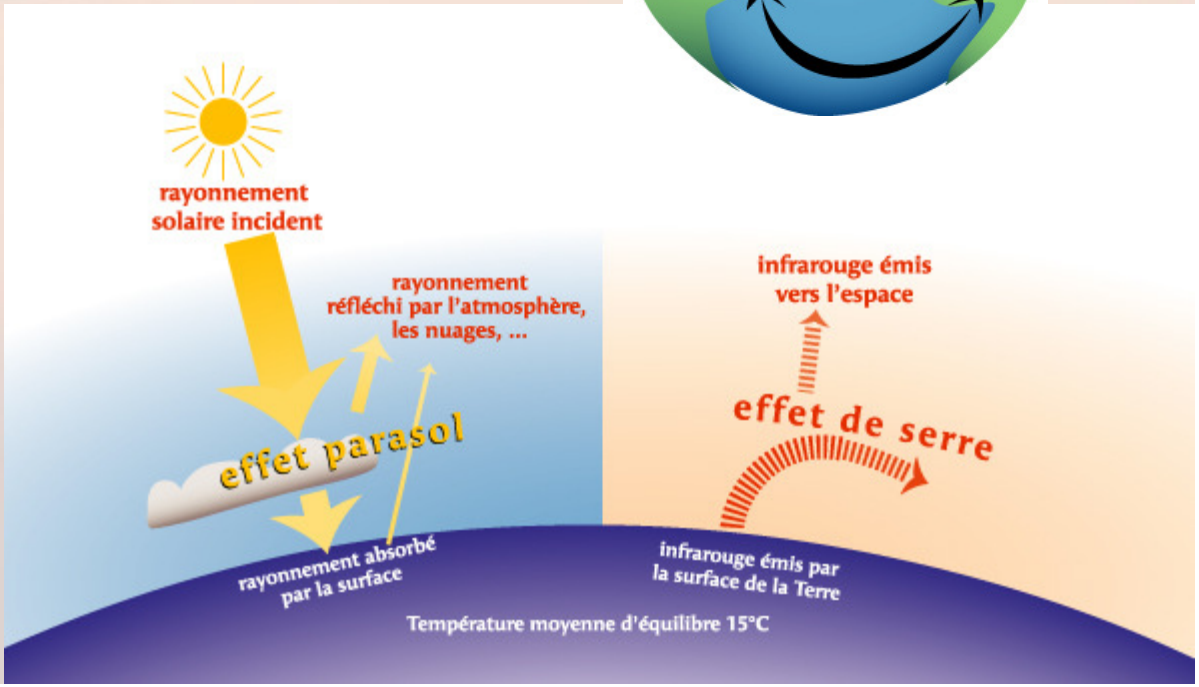
- Liquid and solid

Aerosols (volcanic ash, dust from deserts, spays…)

Heat balance

Atmosphere is one of the main component of the heat machine

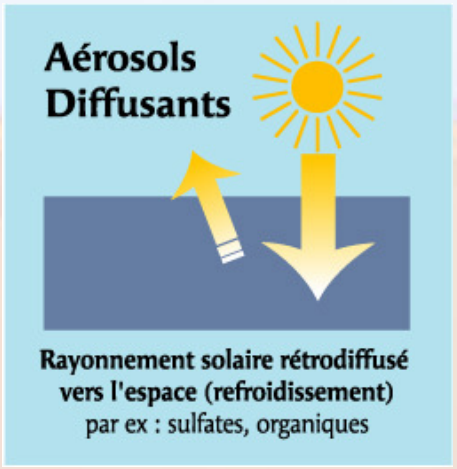
It is responsable for half of the heat balance of the planet.

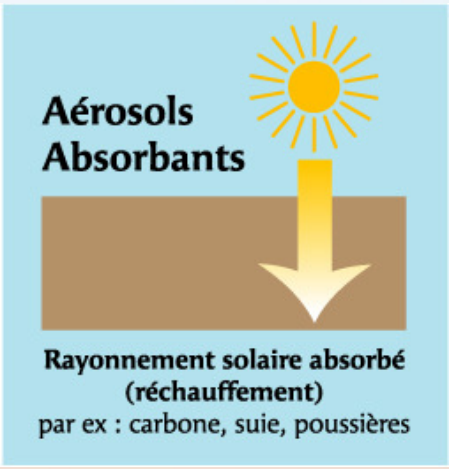


Multiple effects of the (anthopogenic) aerosols

Reflector absorb the solar ray

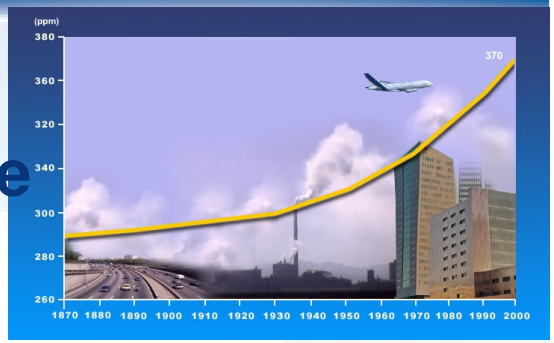
Modify the size of cloud drops

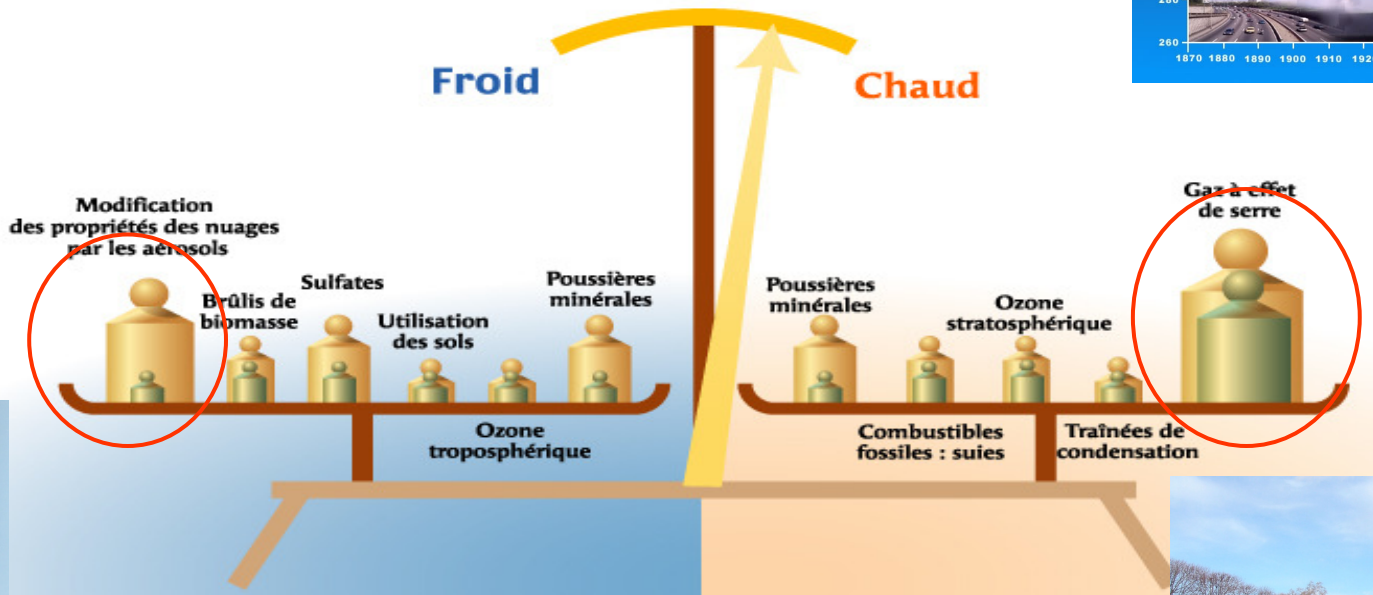




Will these effects change the precipitation pattern ?

The heat machine not balanced any more





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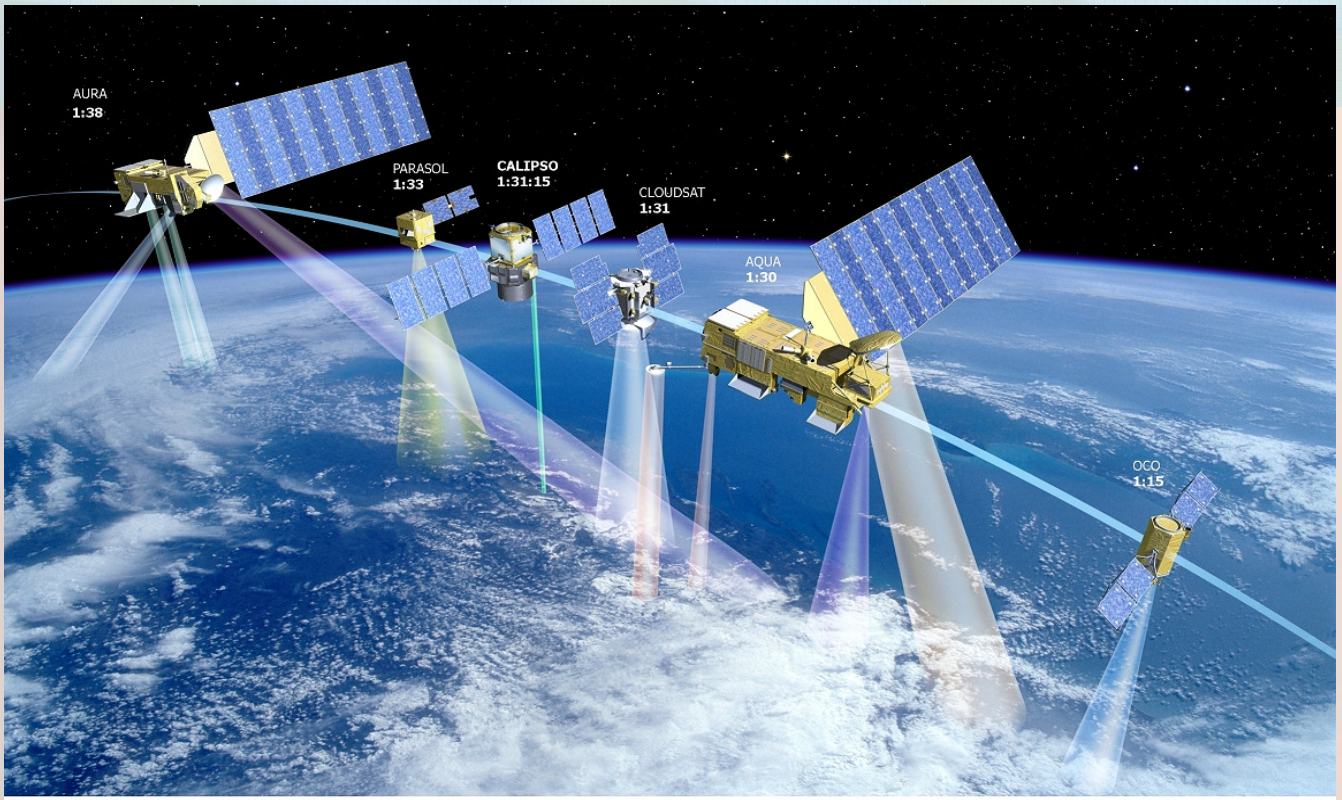
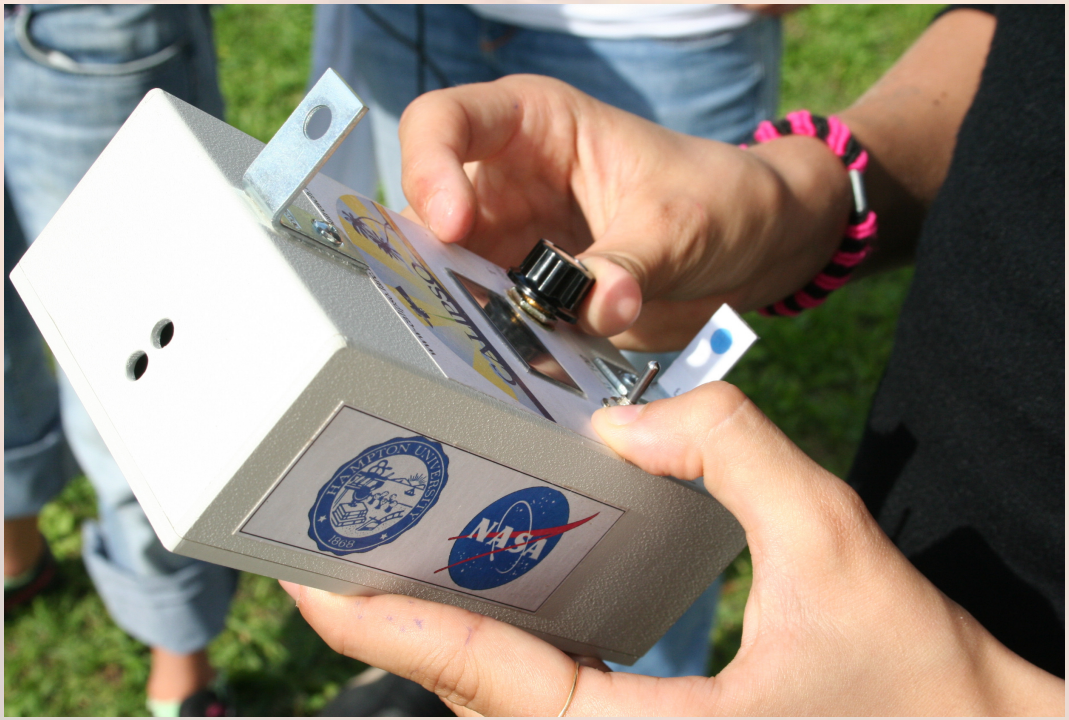
A Train

- **Global measurements,** satellites of the A-Train



Ground measurements

Sun-photometer



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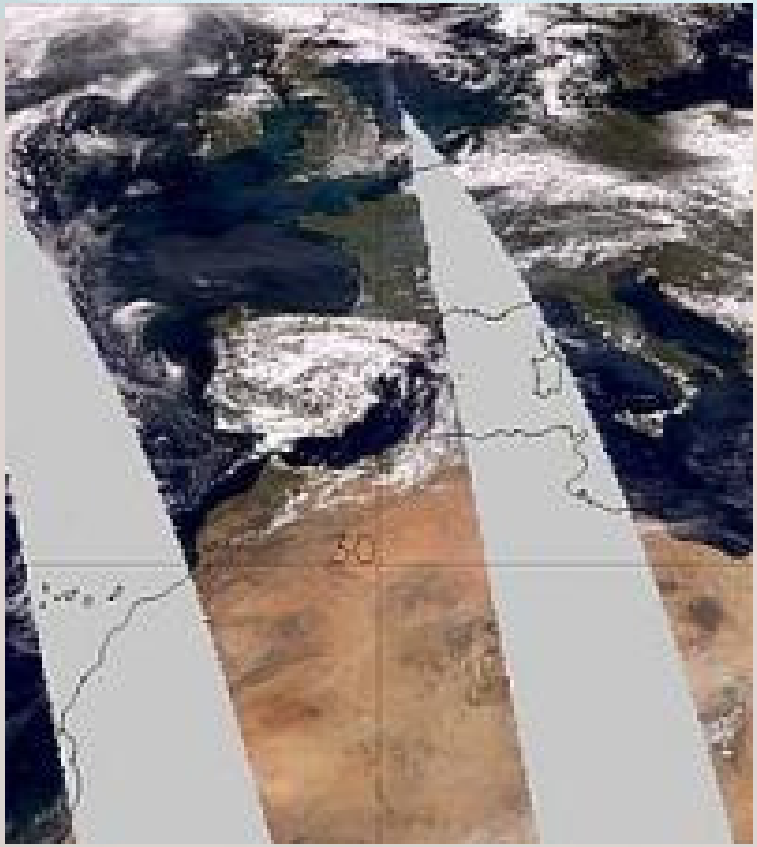
MEASUREMENTS CAMPAIGN
CALISPH'AIR – "VOYAGEURS DES SCIENCES"

Act locally, think globaly!



When : **26 March until 20 April**
Where : **France, Maroc, United-States**
Who: **elementary, Middle, High school**

Aerosols and meteorologic measurements . . .

Temperature

Wind speed

Wind direction

Relative humidity

Atmospheric pressure

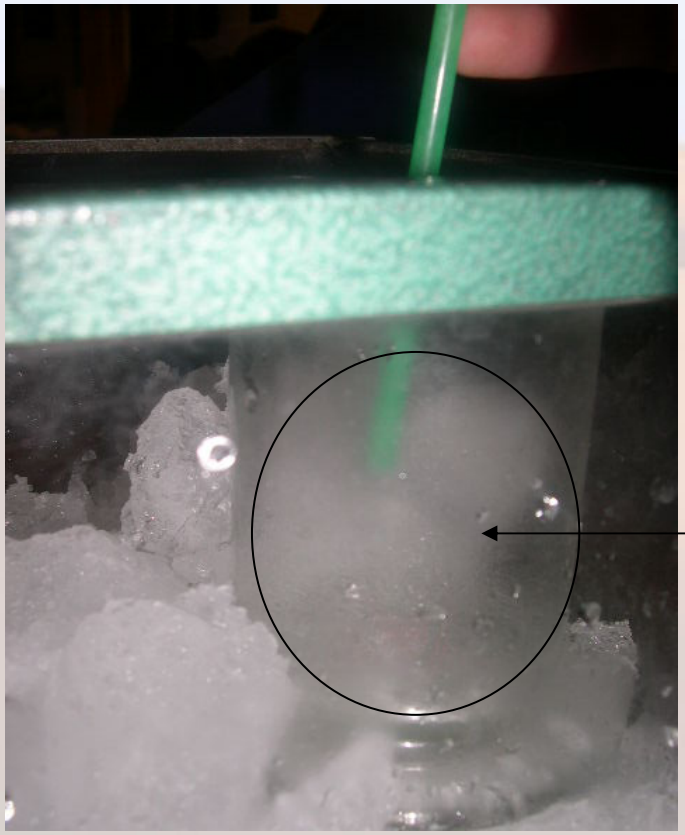
Implementation of the project : experimentation about the formation of the clouds

Hot water vapor

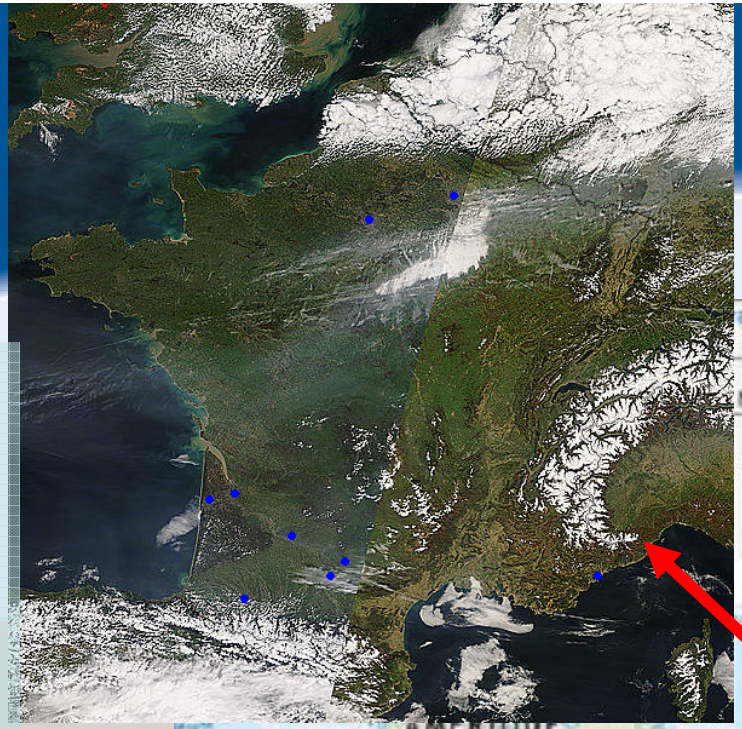
Cold air in the small bottle

Ice cube and salt

Implementation of the project : experimentation about the formation of the clouds

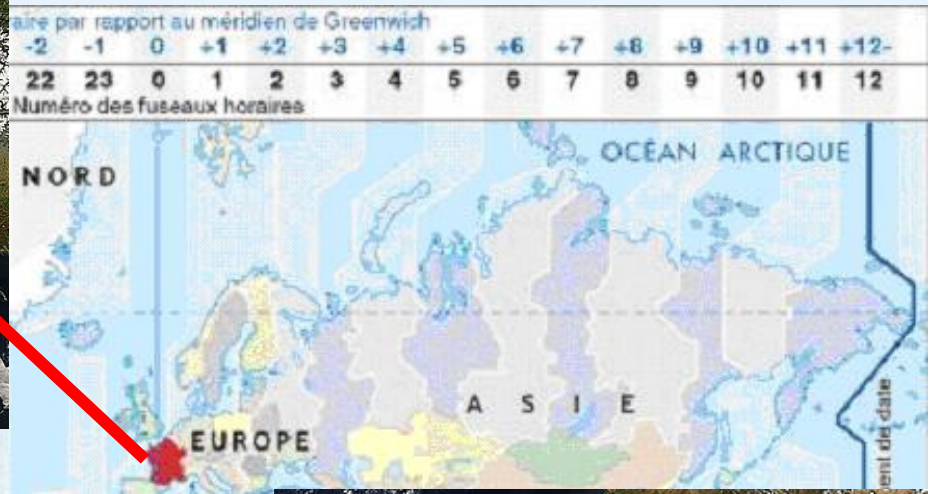


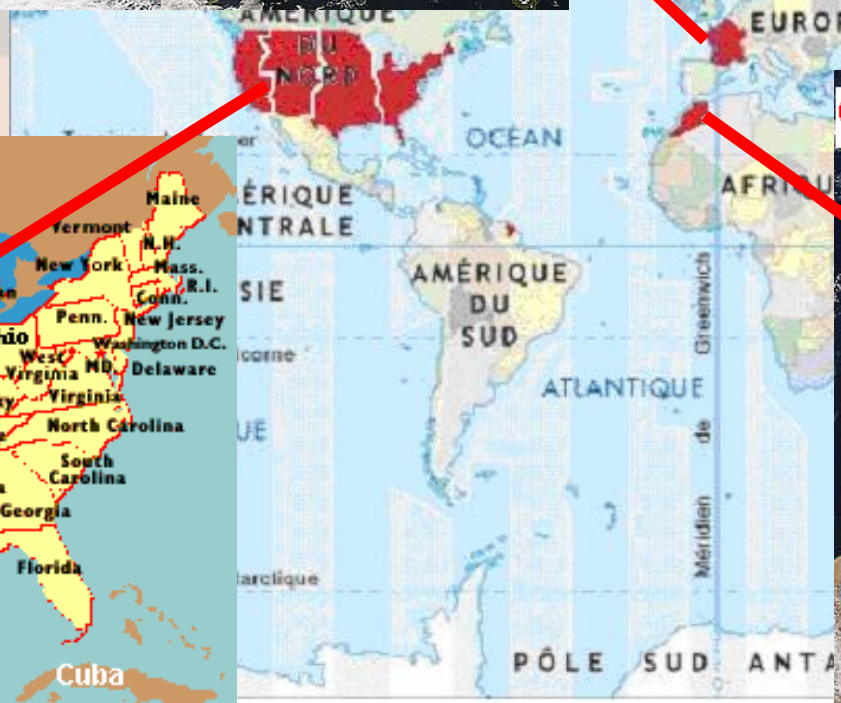
Warm air makes condensation and you can see the formation of small cloud

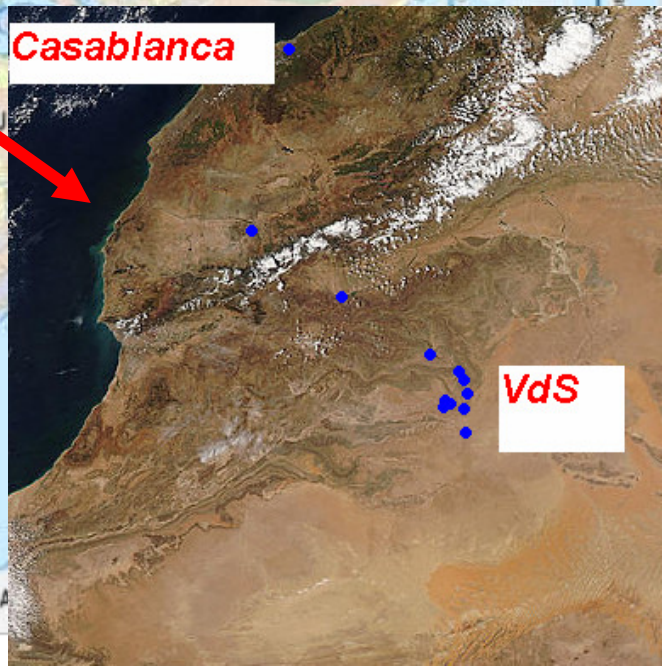


- 17 participants

FRANCE :
Agen, Andernos, Bobigny, Bordeaux, Cestas, Nice, Pau, Rabastens, Reims, Toulouse, Rabastens de bigorre.

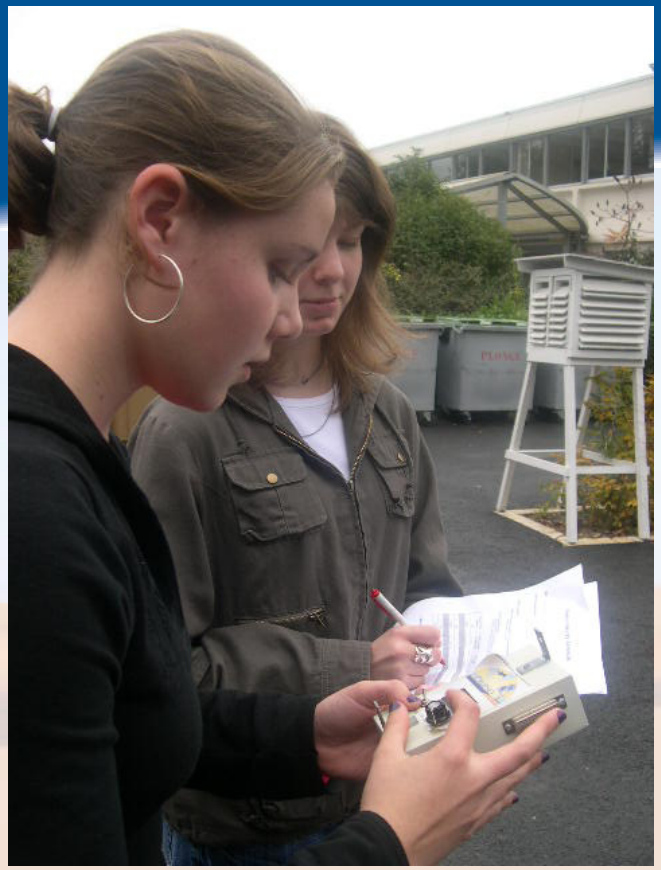






« Voyageurs des sciences »

desert south Marroco



Calisph'Air

FRANCE

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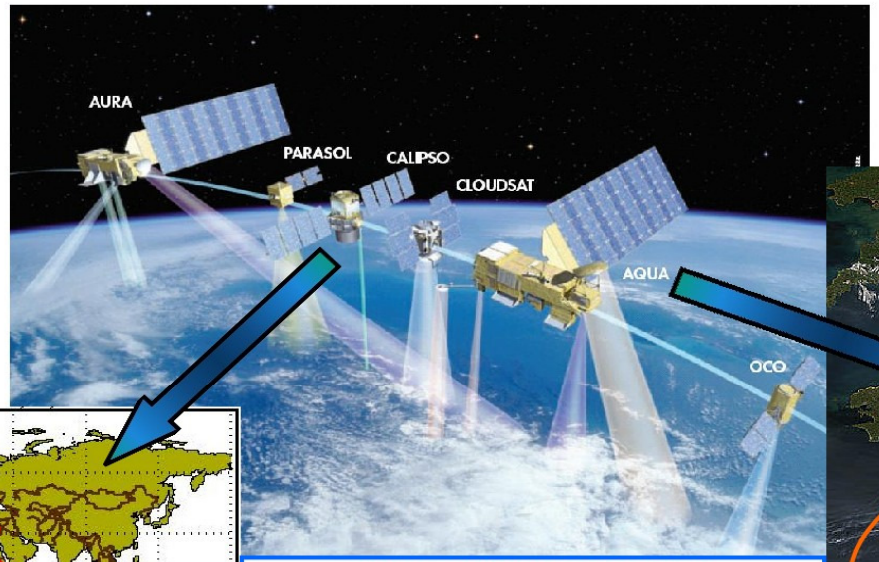
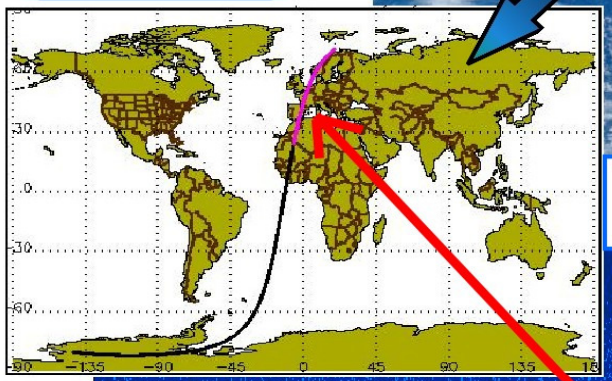
Les satellites de l'A-TRAIN. Observatoire spatial dédié à l'étude de l'atmosphère et du climat.



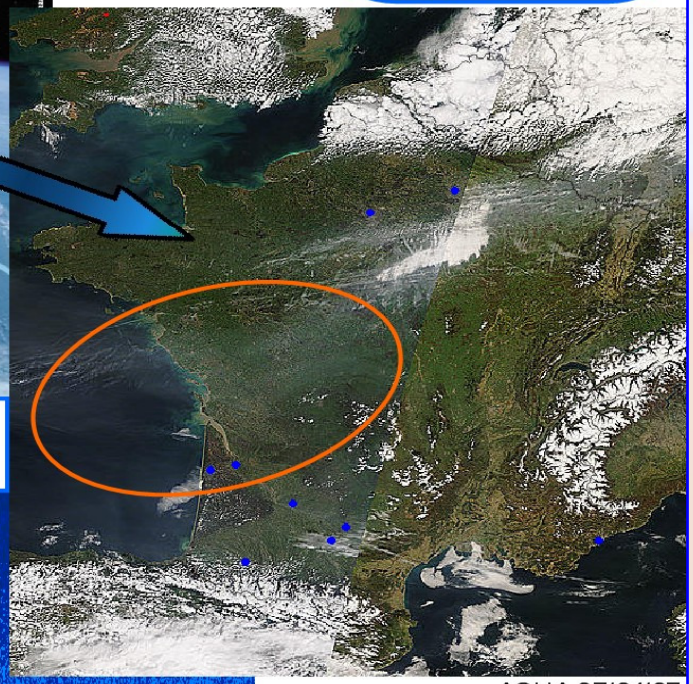
Le voile brumeux observé par AQUA est synonyme de présence d'aérosols sur la zone.

La présence d'aérosols sur le centre-ouest de la France et au Maroc est confirmée par les données CALIPSO (zone orangée).

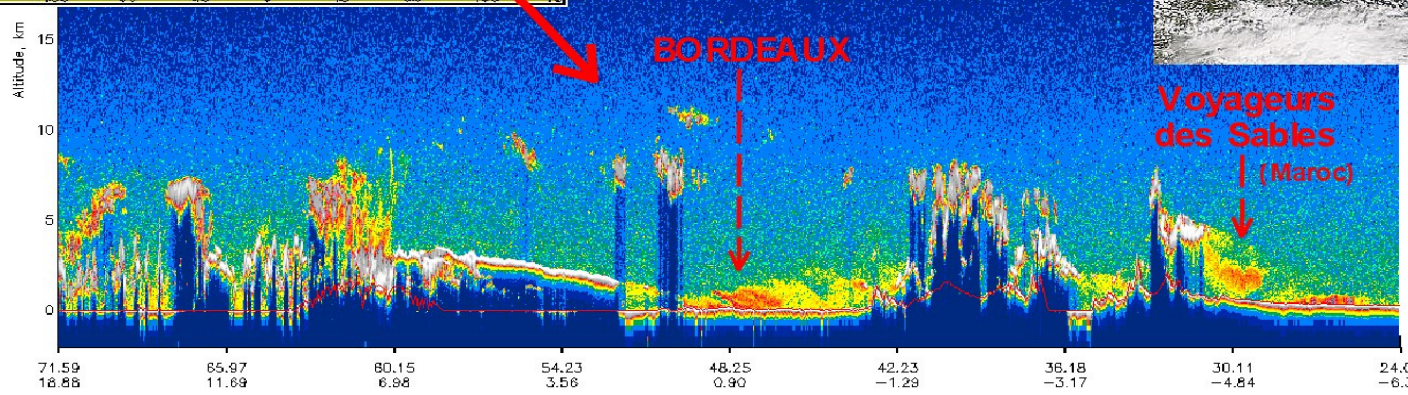


OBSERVATION DES AEROSOLS - 7 Avril 2007

Begin UTC: 2007-04-07 02:11:08.0022



AQUA 07/04/07



LEGENDE

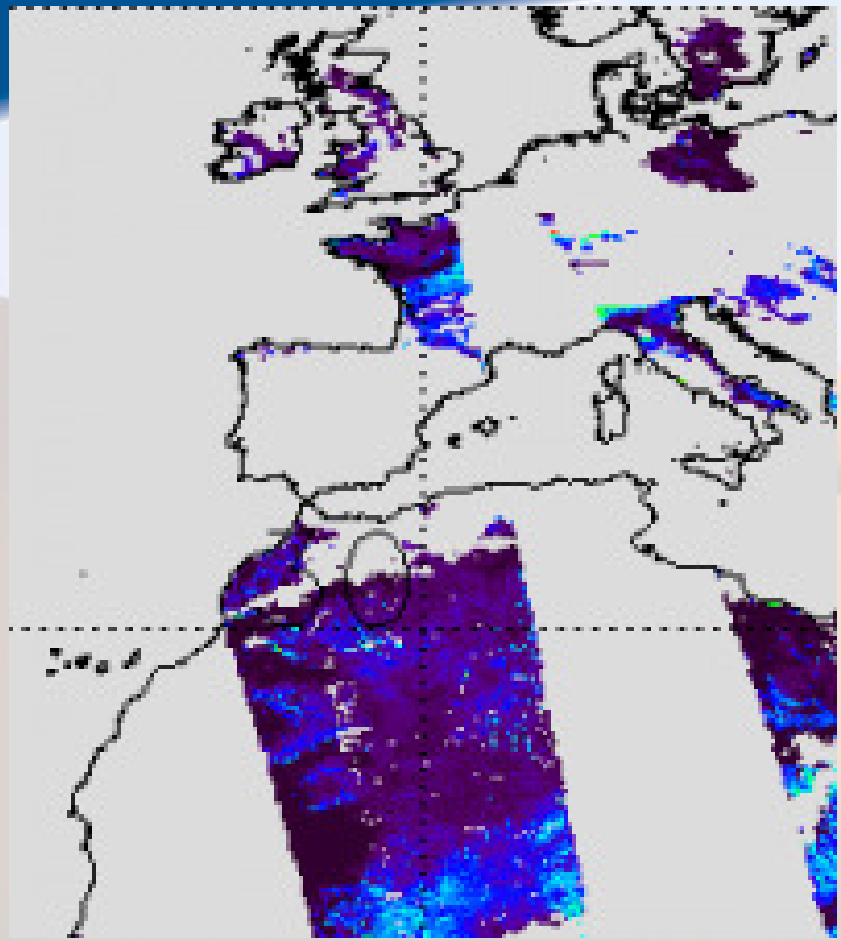
Aérosols de surface

nuages

atmosphère

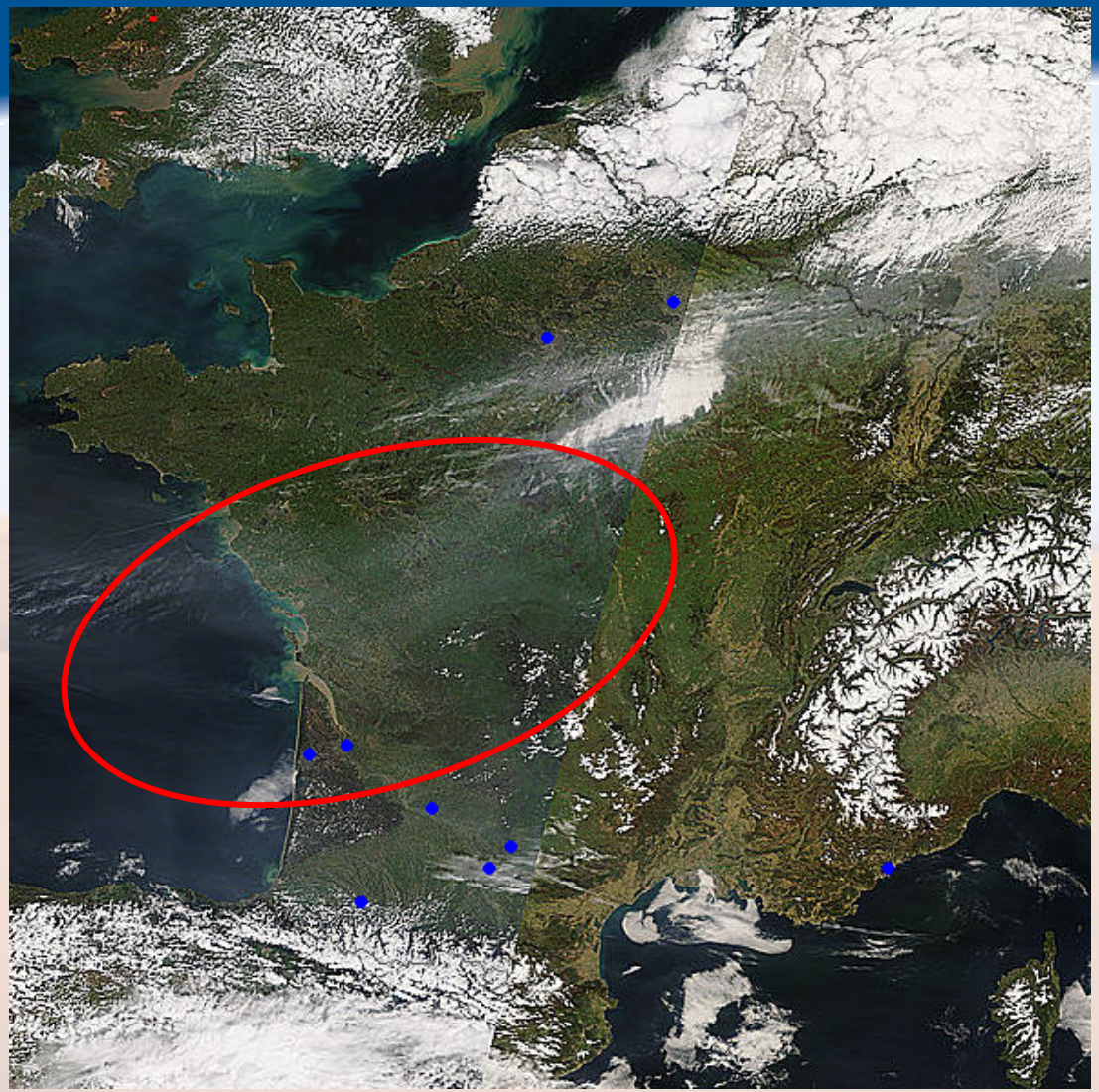
Trace du satellite CALIPSO. Profil vertical de l'atmosphère.

CALIPSO 07/04/07



Parasol

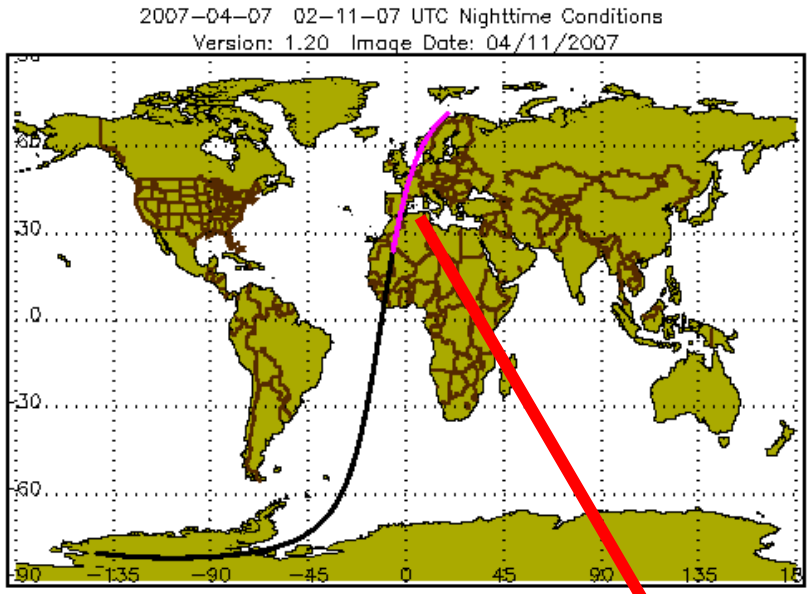
(07/04/2007)



Aqua

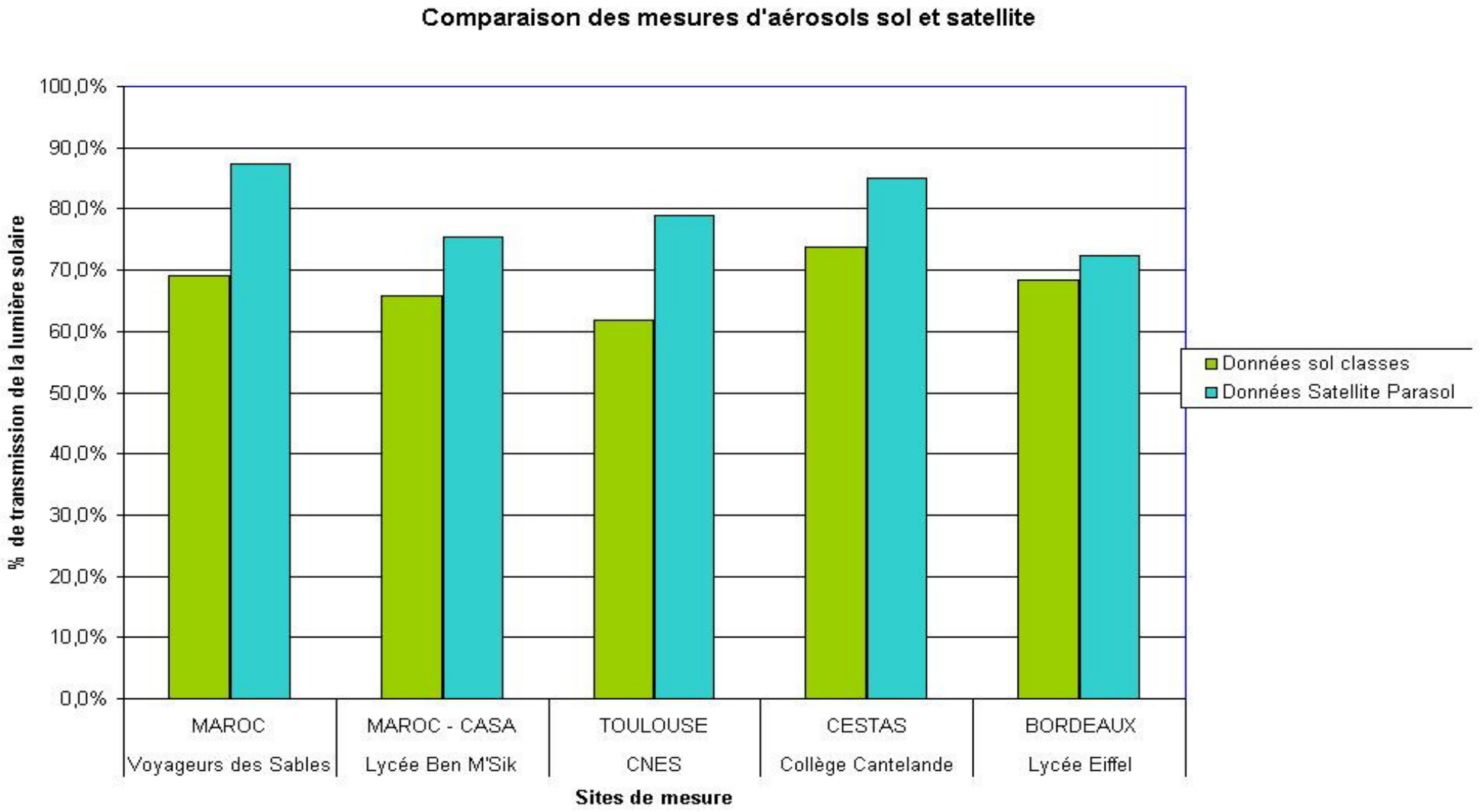
(07/04/2007)

Calipso
(07/04/2007)



DATA results

VILLE Ecole	VOYAGEURS MAROC-Midi	MAROC-CASA Lycée Ben M'Sik	TOULOUSE CNES	CESTAS collège Cantelande	BORDEAUX Lycée Gustave Eiffel	USA - KENSAS Fort Hays
Heure locale	17:42	13:00	14:00	14:00	14:00	11:00
Heure UTC	17:42	13:00	12:00	12:00	12:00	16:00
Température (sonde) (°C)	pas de données	pas de données	pas de données	pas de données	pas de données	25.4
Température (station) (°C)	28,8	21	20,25	20,8	16.2	26.3
Force du vent (km/h)	25.8	18.52	8,87	19,3	pas de données	3.3
Direction du vent	WSW	N	SSO	N	pas de données	W
Pression absolue (hPa)	1012	1012	pas de données	1015	1014	1016
Humidité relative (%)	24	pas de données	46,79	38	33	45
Canal Vert (V)	0,0973	0,614	0,61	1,03	0,935	1,105
Canal Rouge (V)	0,0542	0,466	0,352	1,04	0,811	1,178V
AOT Vert	0,370	0,257	0,288	0.304	0,378	0,068
% de transmisison	69%	77%	74,89%	73.8 %	68,40%	93,40%
Données Satellite Parasol	0,136 - 87,28%	0,063 - 93,4%	0,222- 80%	0,153 - 85,1%	0,328 - 72,4%	0,096 - 90,85 %
% de ciel couvert	10 à 25	10	grand ciel bleu	0 à 10	ciel bleu	Ciel bleu
HAUTE ALTITUDE	CIRRUS	AUCUN	AUCUN	Cirrus	AUCUN	AUCUN
MOYENNE ALTITUDE	AUCUN	Altostratus	AUCUN	AUCUN	AUCUN	AUCUN
BASSE ALTITUDE	AUCUN	AUCUN	AUCUN	AUCUN	AUCUN	AUCUN
NUAGES de PLUIE	AUCUN	AUCUN	AUCUN	AUCUN	AUCUN	AUCUN


Comparaison des mesures d'aérosols sol et satellite
% de transmission de la lumière solaire
100,0%
90,0%
80,0%
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
MAROC
Voyageurs des Sables
MAROC - CASA
Lycée Ben M'Sik
TOULOUSE
CNES
CESTAS
Collège Cantelande
BORDEAUX
Lycée Eiffel
Sites de mesure
Données sol classes
Données Satellite Parasol

RESULTS PRESENTATION BY PUPILS FOR PUPILS

- **Practice and communicate**
- **Work together and become « world citizen »**

Thanks !