



ACTRIS-ACSM intercomparison study at SIRTA

(Gif/Yvette, France)

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LABORATOIRE DES SCIENCES DU CLIMAT & DE L'ENVIRONNEMENT
Prague, 07-09/ 2013



ACTRIS-ACSM intercomparison study

- Participants:

- ACTRIS partners (official or future ACTRIS stations):

FRANCE (LSCE),

UK (King's College London),

SPAIN (CIEMAT, IDAEA-CSIC),

IRELAND (NUIG),

SWITZERLAND (PSI),

GERMANY (TROPOS, DWD),

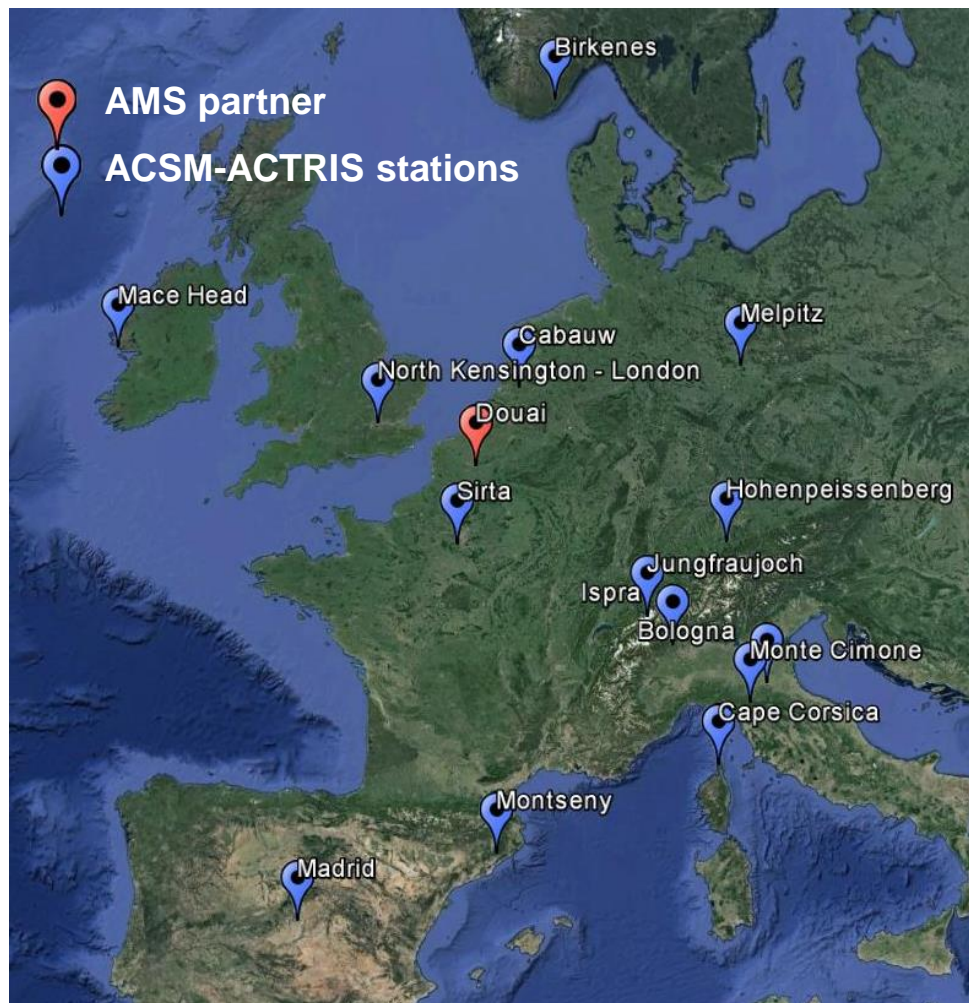
NORWAY (NILU),

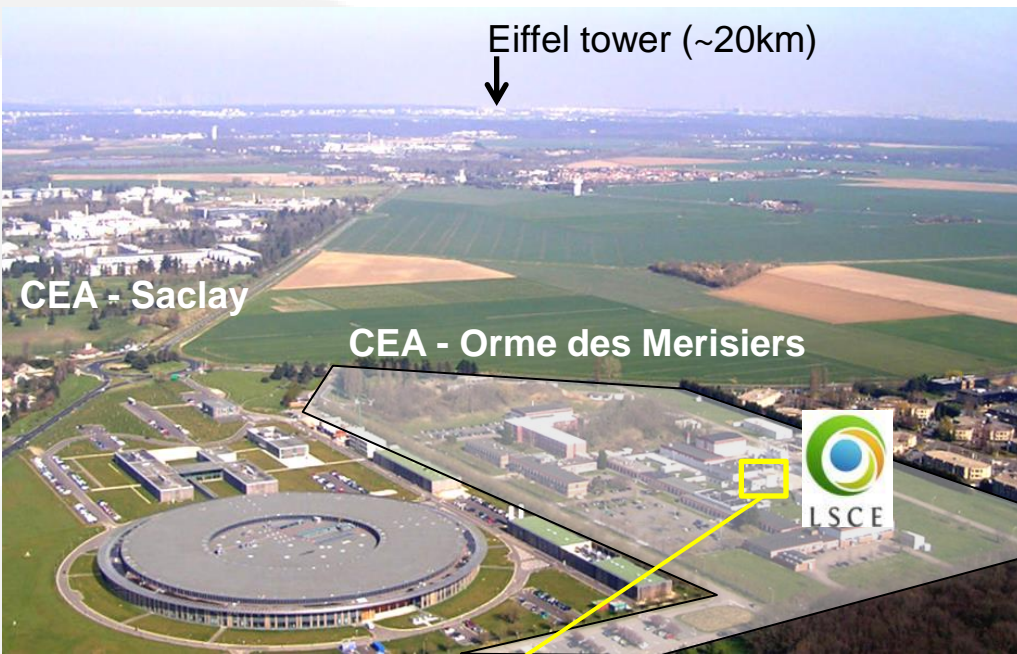
ITALY (ISAC-CNR, ENEA)

- AMS partner → FRA (Mines Douai)

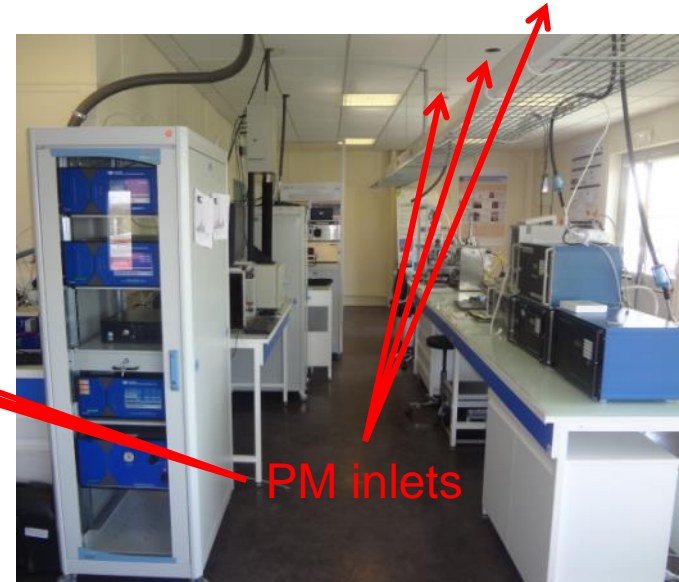
- ARI support (P. Croteau and J. Jayne)

12 ACSMs !!
+ 1 e-ToF-ACSM
+ 1 HR-ToF-AMS





SIRTa-LSCE atmospheric station (French ACTRIS TNA since mid. 2011)



Laboratory = 70m², 2 technical rooms = 12m² each

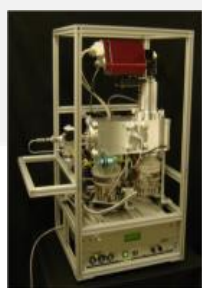
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Real-time measurements of aerosol properties (since 09/2011)

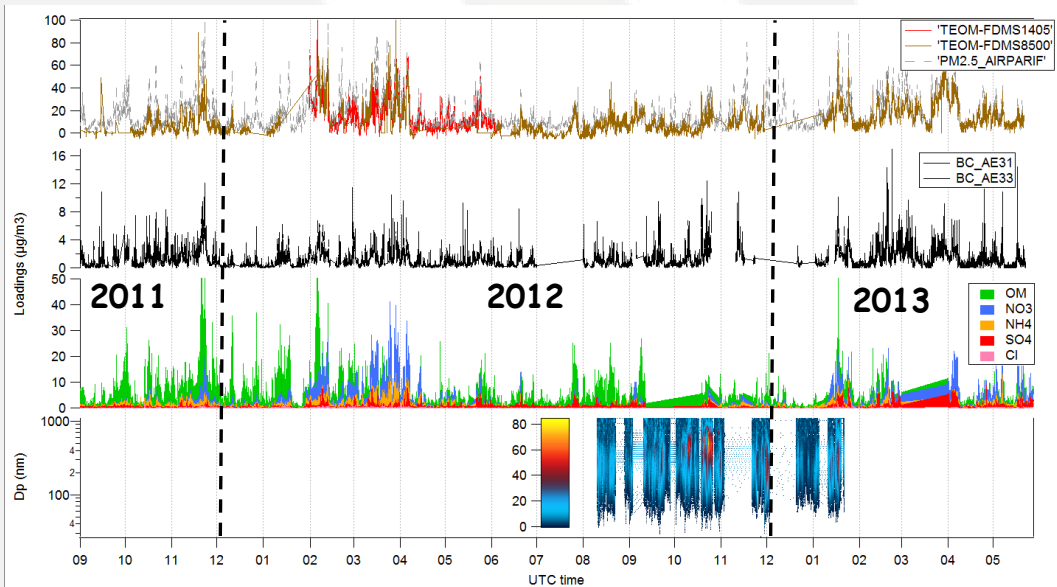
First NO/NO₂ measurements of ACTRIS program at SIRTA



SMSA-C: The CPC Model 5.416 combined with a DMA for size distribution measurement



énergie nucléaire - énergie atomique

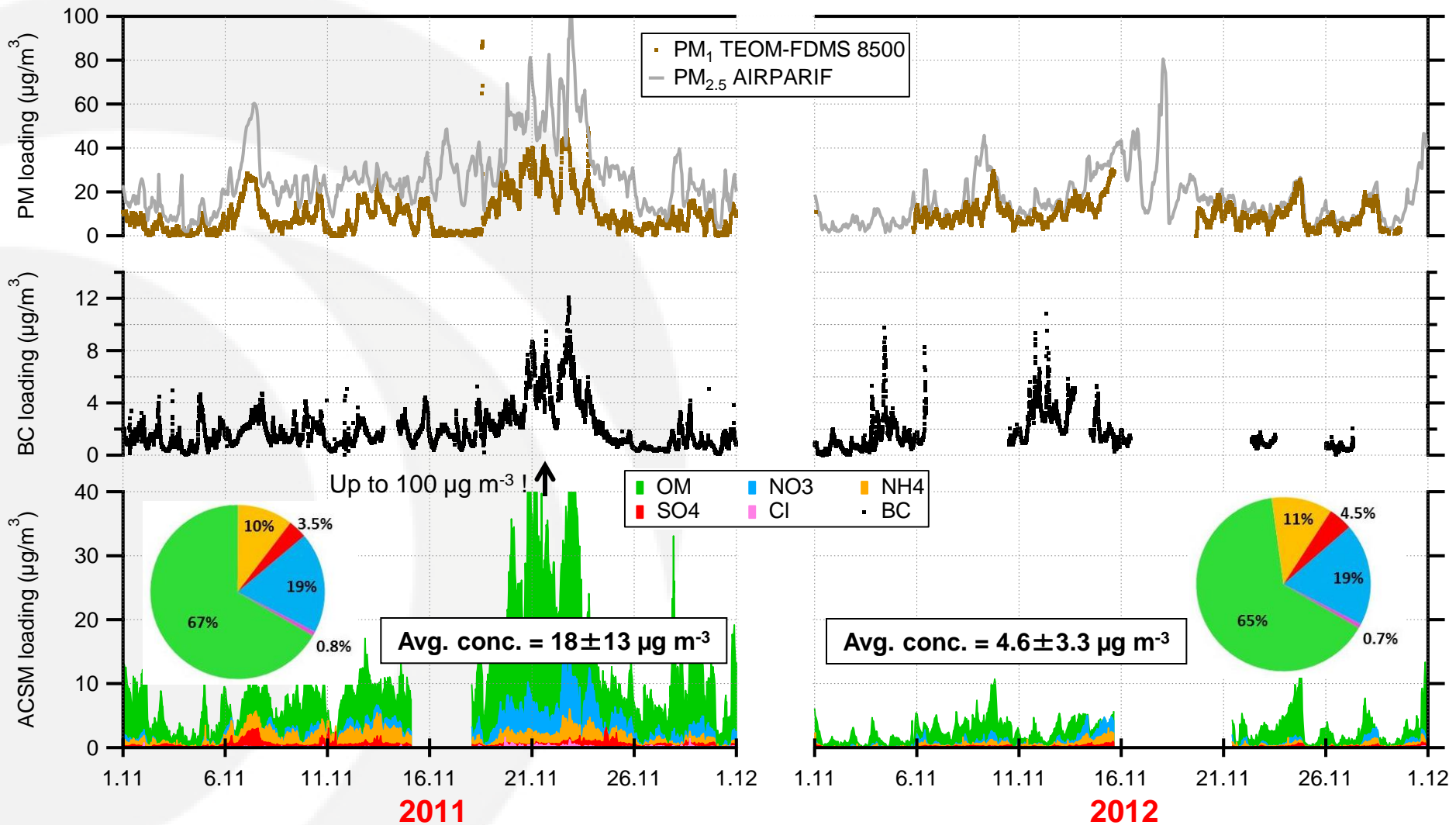


+ extra monitoring gas-phase measurements (CO, CO₂, H₂, Radon, O₃, NO, NO₂)

+ PTR-MS (VOCs) during the ACSM intercomp study



Expected Concentrations in November



ACTRIS-ACSM intercomparison study

- Schedule / Strategy:

October :

Implementation of an instrumental package that has been calibrated & intercompared to be used for the ACSM intercomparison

November:

WEEK 1: ACSM calibration procedures

- Calibration for each instrument (with a single SMPS)
- NH_4NO_3 , $(\text{NH}_4)_2\text{SO}_4$, organic mixture (glutaric, malonic, oleic acids, MSA ...)
- Other important calibrations and checking (lens alignment, flow calibration, m/z resolution, DAQ version, ...)

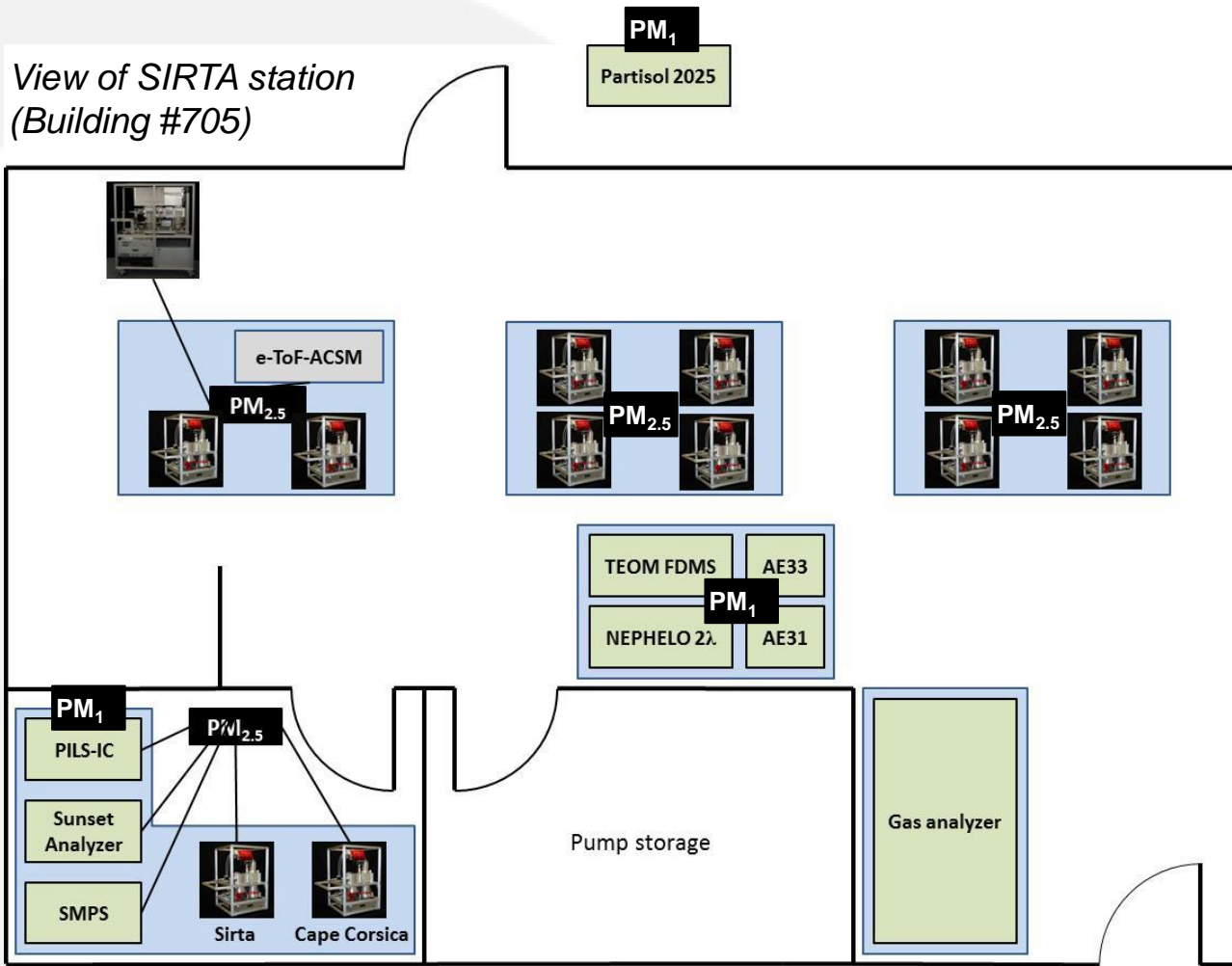
WEEKS 2 and 3: Ambient measurements

Data analysis intercomparison -PMF & ME-E analyses



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View of SIRTA station
(Building #705)



- Logistics:

3 groups of 4 ACSMs

common PM_{2.5} inlet / group

One dryer / ACSM

1 SMPS (INERIS) qualified by TROPOS (ACTRIS intercomparison Sept. 2013)

- Co-located instruments
- TEOM-FDMS (PM₁)
- SMPS (PM₁)
- PILS-IC (PM₁)
- PILS-MS (PM₁)
- OCEC Sunset Inst. (PM₁)
- PARTISOL (PM₁)
- NEPHELOMETER (PM₁)
- AETHALOMETER (PM₁)
- PTR-MS



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COMPARISON WITH OTHER AEROSOL INSTRUMENTS

PM closure studies:

SMPS ACTRIS (in PM1)

TEOM-FDMS (in PM1)

Nephelometer ACTRIS (in PM1)

Chemical compounds comparison:

OCEC Sunset Field Inst. – OC/OM in PM1

PILS-IC – NO₃, SO₄, NH₄ in PM1

Filter sampling in PM1

EXTRA INSTRUMENTS FOR FURTHER DATA ANALYSIS (PMF/ME-2)

PILS-IC (on-line Na, K, Mg, Oxalate, ...)

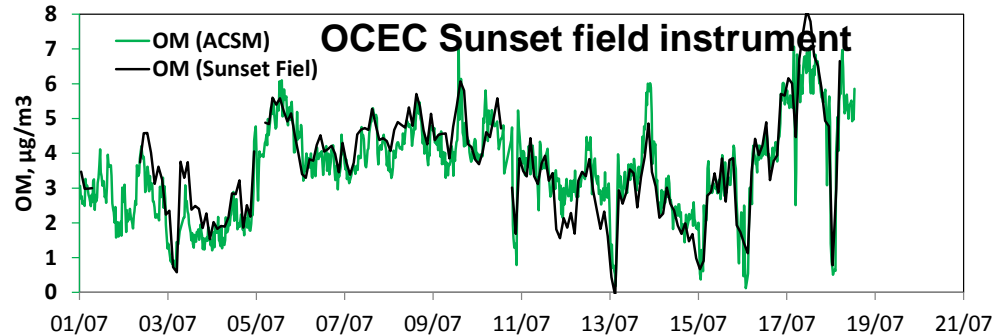
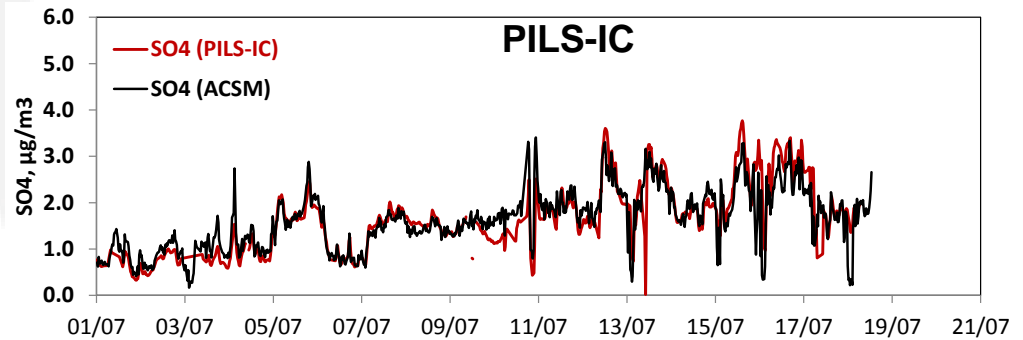
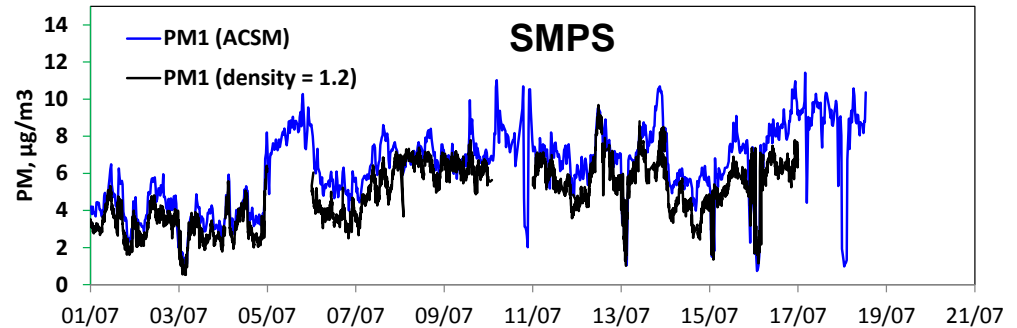
PILS-MS/MS (on-line levoglucosan)

Aethalometer 7- (BC_{ff}, BC_{wb})

PTR-MS (VOCs)

Other trace gases (CO, CO₂, H₂, NO, NO₂, O₃...)

ChArMEx field campaign, Cape Corsica station (July 2013):



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Thanks for your attention !



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