

 HYGEOS	Prévision à courte échéance de la Visibilité dans le cycle de vie du Brouillard, à partir de données d'Observation Sol et Satellite	Réf.	
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PreViBOSS:

PREvision à courte échéance de la Visibilité dans le cycle de vie du Brouillard, à partir de données d'Observation Sol et Satellite

**Point hebdomadaire sur les paramètres extraits de la base de données
du SIRTa,
Campagne ParisFog 2011-2012
24/10/2011**

	Fonction	Nom	Signature	Date
Préparé par	Chef de Projet	Thierry Elias		
Approuvé par				
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Liste de diffusion

INTERNE	EXTERNE	
Prénom NOM	Prénom NOM	Société / Organisme
Dominique Jolivet Thierry Elias	sirtatech Frédéric Burnet Laurent Gomes	IPSL CNRM/GAME CNRM/GAME

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Etat du document

PREvision à courte échéance de la Visibilité dans le cycle de vie du Brouillard, à partir de données d'Observation Sol et Satellite État d'avancement, année 1			
Edition	Révision	Date	Raison de la révision
1	0		Version initiale

Suivi des modifications				
Ed.	Rév.	Etat*	Pages modifiées	Raison de la modification

- *I = Inséré S = Supprimé M = Modifié*

1. Particulate pollution

No values of aerosol number concentration (anc) in October other years, we then compare October 2011 with November 2010. Averaged value is smaller in October 2011 than in November 2010, and values larger than 20 000 cm^{-3} are rare (**Figure 1**). October 2011 is characterised by a monomodal distribution with maximum frequency between 4000 and 7000 cm^{-3} . This mode is also observed in November 2010, but a further mode with maximum frequency is also observed centered around 10 000 cm^{-3} .

During the night (**Figure 2**), values in October 2011 are close to values in November 2010, but averaged anc reaches only 10 000 cm^{-3} during traffic peak hours, while in November 2010 it reaches 15 000 cm^{-3} , which explains the larger values observed in the frequency distribution (**Figure 1**).

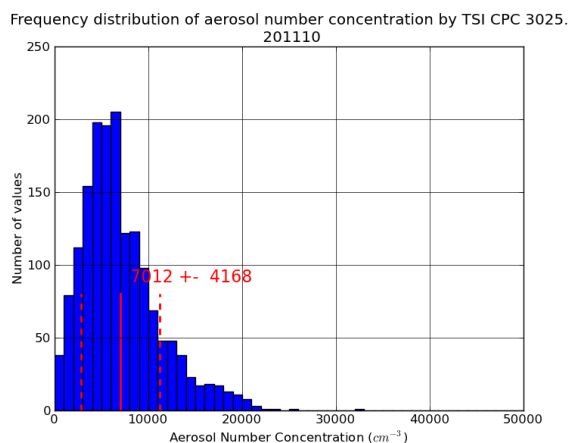
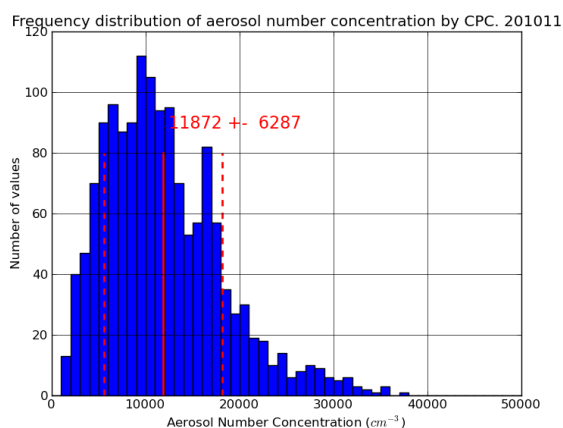


Figure 1. Distribution frequency of anc values measured by CPC in November 2010 and October 2011. Averaged value is written in red, with standard deviation.

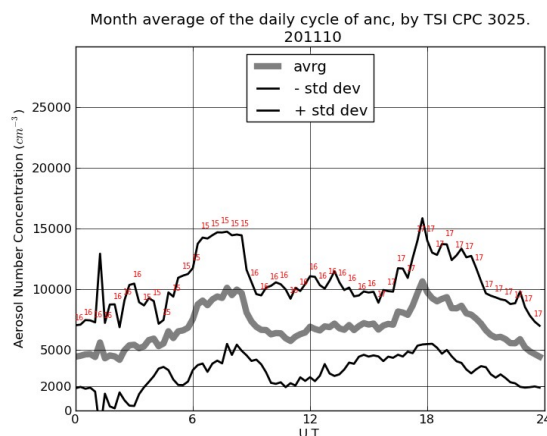
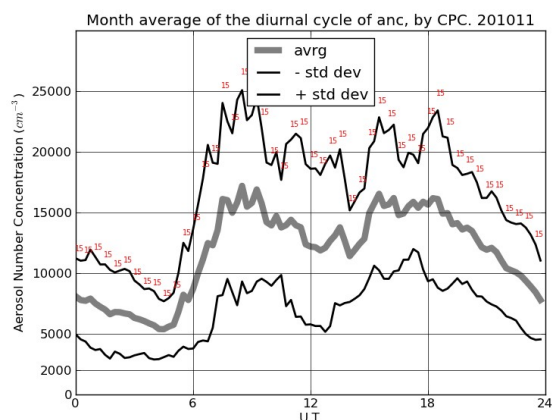


Figure 2. Averaged daily cycle of anc, measured by CPC in November 2010 and in October 2011. Red numbers give the number of values available for averaging.

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The aethalometer performed measurements in both October 2010 and 2011. Up to now (24/10), measured values of BC aerosol mass (amcBC) is overall smaller than in 2010 (**Figure 3**), with an averaged value smaller and a maximum frequency between 0.2 and 0.4 $\mu\text{g m}^{-3}$ in October 2011 while it was twice larger in October 2010, included between 0.6 and 0.8 $\mu\text{g m}^{-3}$.

Whatever the time of the day, it seems amcBC is smaller in October 2010 than in 2011 (**Figure 4**). It is twice smaller in 2011, during night and at peak traffic times.

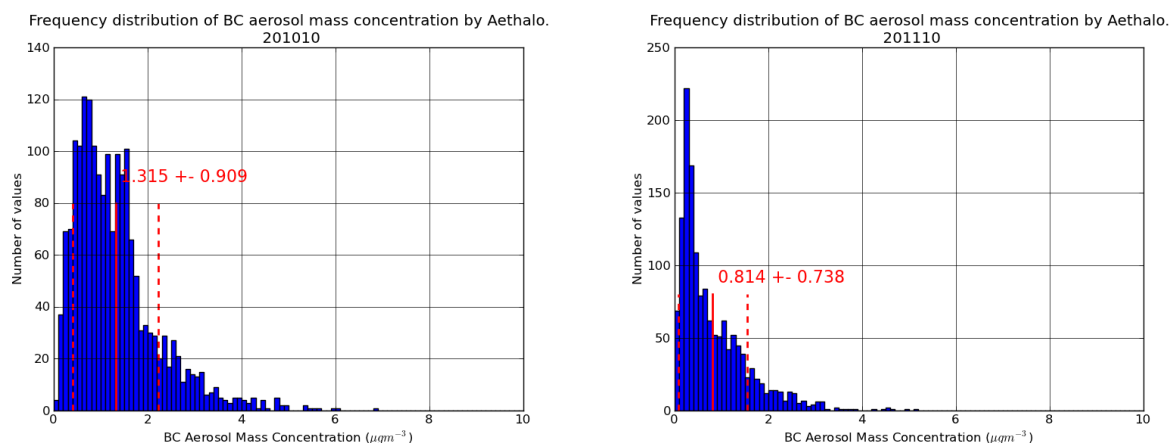


Figure 3. As Figure 1 but for BC component of the dry aerosol mass concentration (amcBC), in October 2010 and in October 2011.

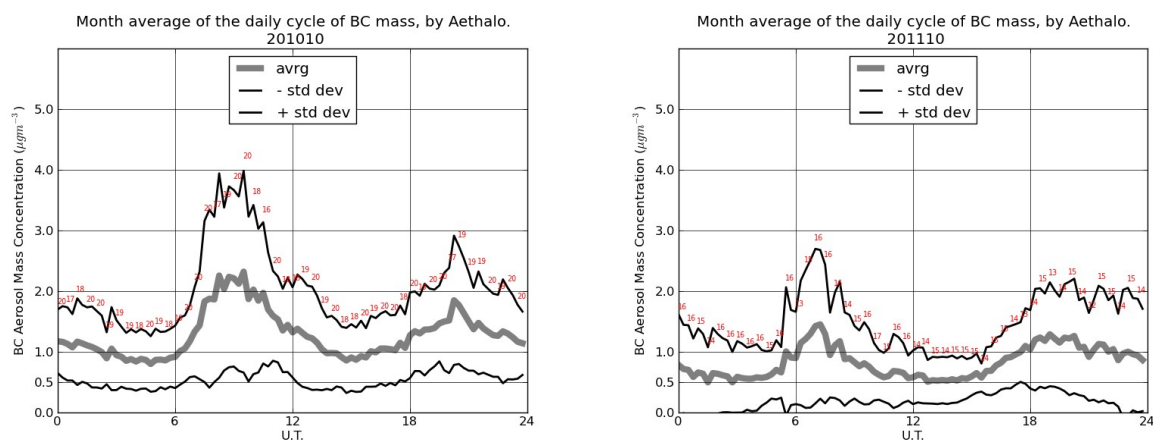


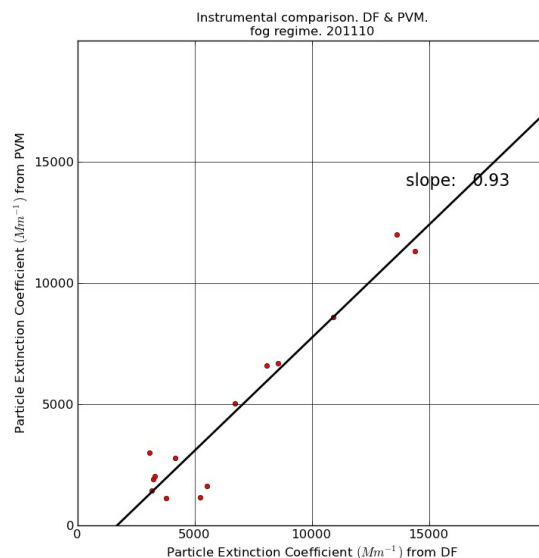
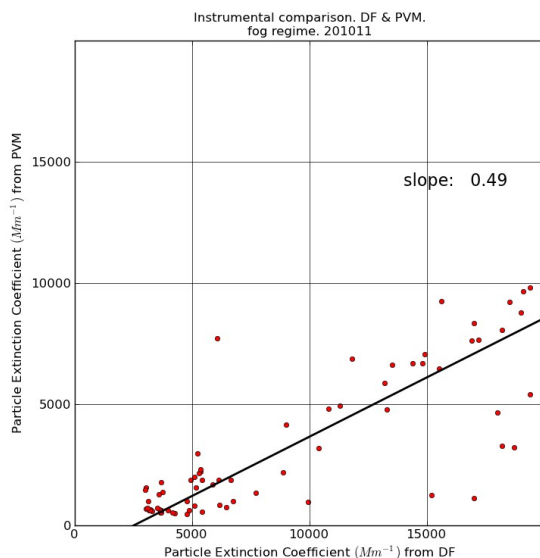
Figure 4. As Figure 2 but for BC component of the dry aerosol mass concentration (amcBC), in October 2010 and in October 2011.

2. Fog extinction

Fog extinction derived from three instruments, is compared in **Figures 5 and 6**. Almost no fogs occurred in October 2010, then November and December 2010 data are shown, to be compared to October 2011.

Fog extinction is directly measured by the DF visibilimeter and the PVM instrument, at 550 nm and 708 nm respectively. In fog, spectral dependence is smaller than instrumental uncertainties. Agreement is good in October 2011 while the slope remains around 0.5 in 2011 (**Figure 5**). Values larger than 10 000 Mm^{-1} are observed by PVM in October 2010 which were not observed by PVM in November 2010. Such values were also observed by PVM in December 2010, but they correspond to more than 15000 Mm^{-1} according DF, while in October 2011 agreement is better and extinction is smaller than 15000 Mm^{-1} according DF.

Similarly, the agreement between DF and FM100 is good in October 2011, and much better than in 2010.



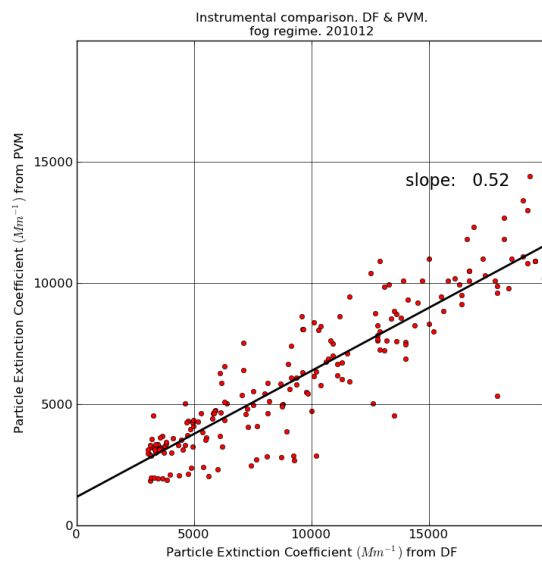
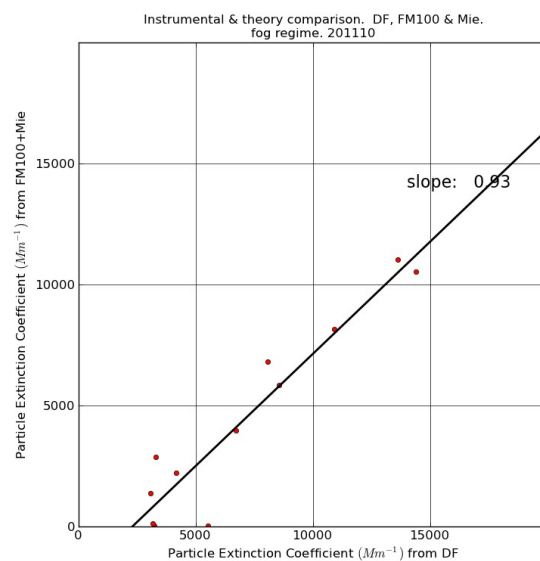
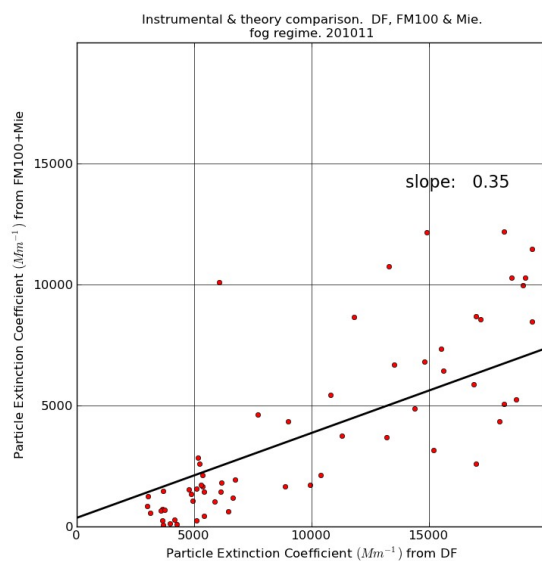


Figure 5. Comparison between DF visibilimeter and PVM instrument, in terms of particle extinction coefficient in fog regime only (visibility < 1000 m), for November, December 2010 and October 2011. The slope of the linear regression is indicated.



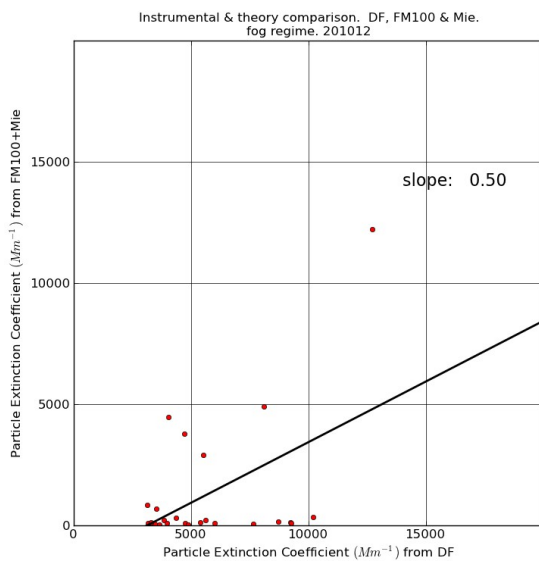
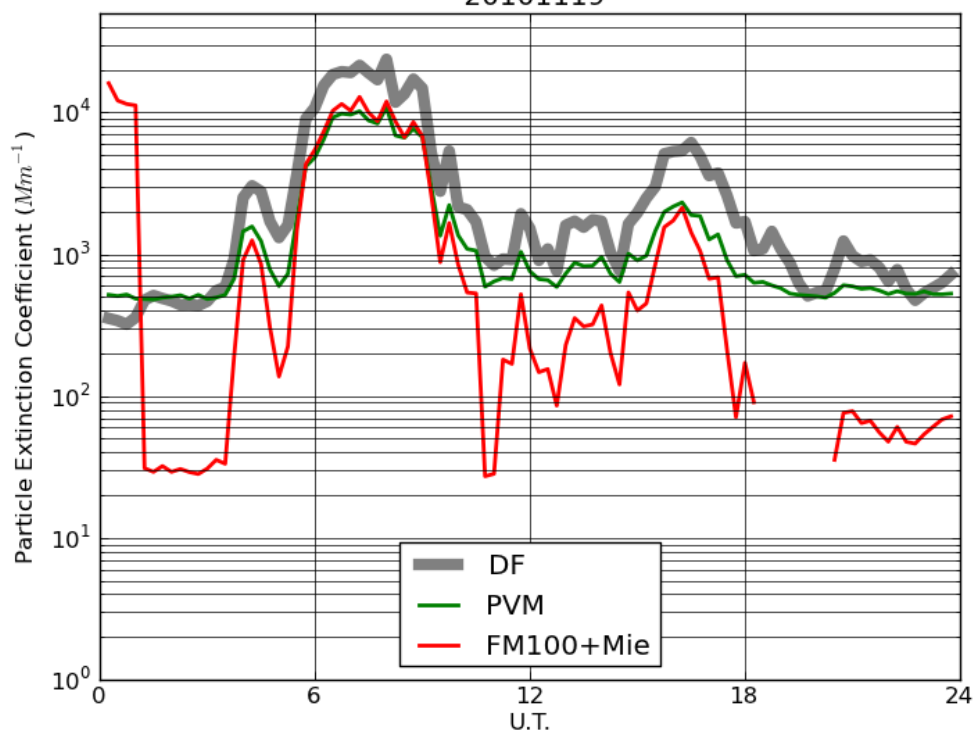


Figure 6. As Figure 5 but for comparison between DF and FM100 particle counter, with extinction coefficient computed according Mie theory.

Time series of particle extinction coefficient during one fog event of November 2010 and one fog event of October 2011 show how well is represented the increase of extinction as the fog appears during both events, with however a quantitative agreement on 22 October 2011 (**Figure 7**). FM100 and PVM seem to both underestimate by a factor 2 extinction on 19 December 2010.

Instrumental comparison, aerosol optics.
20101119



Instrumental comparison, aerosol optics.
20111022

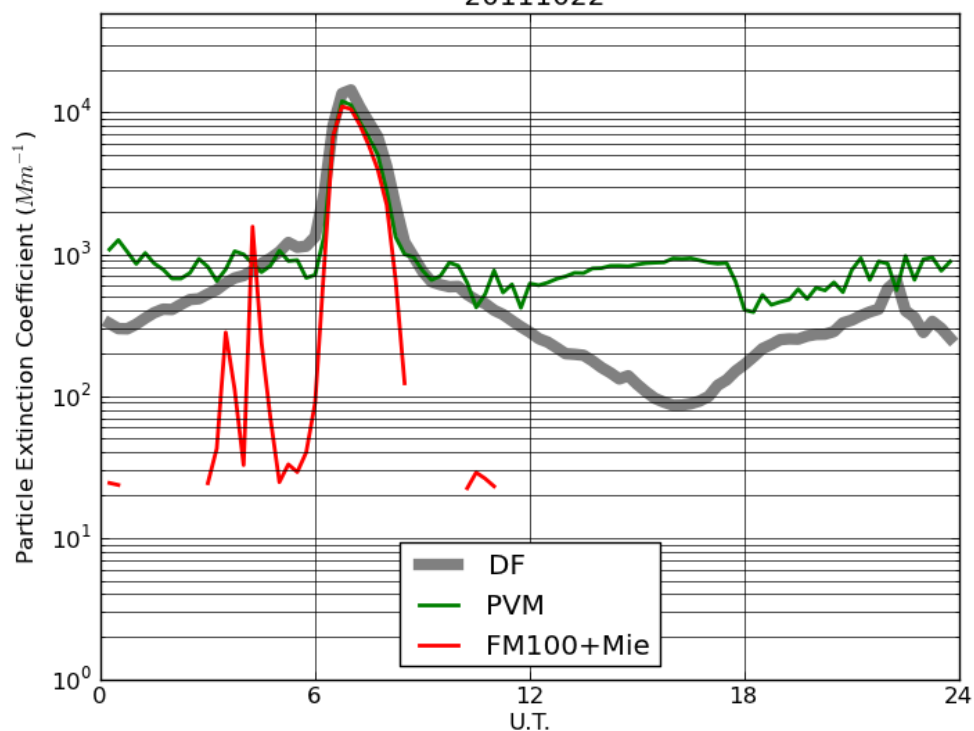


Figure 7. Comparison of particle extinction coefficient derived from three instruments (DF, PVM and FM100), for two fog events: 19/11/2010 and 22/10/2011.

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3. Data processing

- Meteo.

meteoZ1: V03 au lieu de V02, mais pas de changements sur les colonnes, donc ok.

DF: ok.

BSRN z1: ok

- Pollution particulaire.

CPC:

ajouter la description de l'instrument.

2007. "Grimm CPC, 4 nm - 2.5 microns, owned by LSCE"

2010. "TSI CPC 3025, 2.5 nm - 2.5 micron, owned by CNRM"

Il est écrit TEOM FDMS dans le fichier 1a de CPC, ce qui ne colle pas avec cet instrument.

Le format du nombre d'aérosols pourrait être 7.1 au lieu de 7.2.

TEOM:

de nombreuses valeurs négatives, comme le 06/10

AETHALO:

ok, discussion en cours par mail pour instabilités dans 3 canaux.

SMPS: pas de fichiers en 1a, septembre octobre 2011.

GRIMM: pas de fichiers en 1a, en 2011

- Brume:

WELAS: pas de fichiers en 1a, en octobre 2011.

- Eau liquide.

PVM:

en-tête de 1a: Re pas en cm/m³, c'est une distance, peut-être en cm.

lwc semble trop grand hors brouillard, avec des conséquences sur le rayon effectif trop grand aussi. Les échanges de mail de ces derniers jours stipulent un nouvel étalonnage du PVM. Voir ce que ça donne.

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brouillard: psa depasse 1000 micrm2 cm-3 le 04/10, le 17/10 et le 22/10.

FM100:

plus de donnees apres 13:00, chaque jour.

brouillard: rayon effectif depasse 10 micron, lwc atteint 50 mg m-3 les 04/10 et 17/10, le nombre de gouttelettes depasse 100 cm-3 le 17/10.