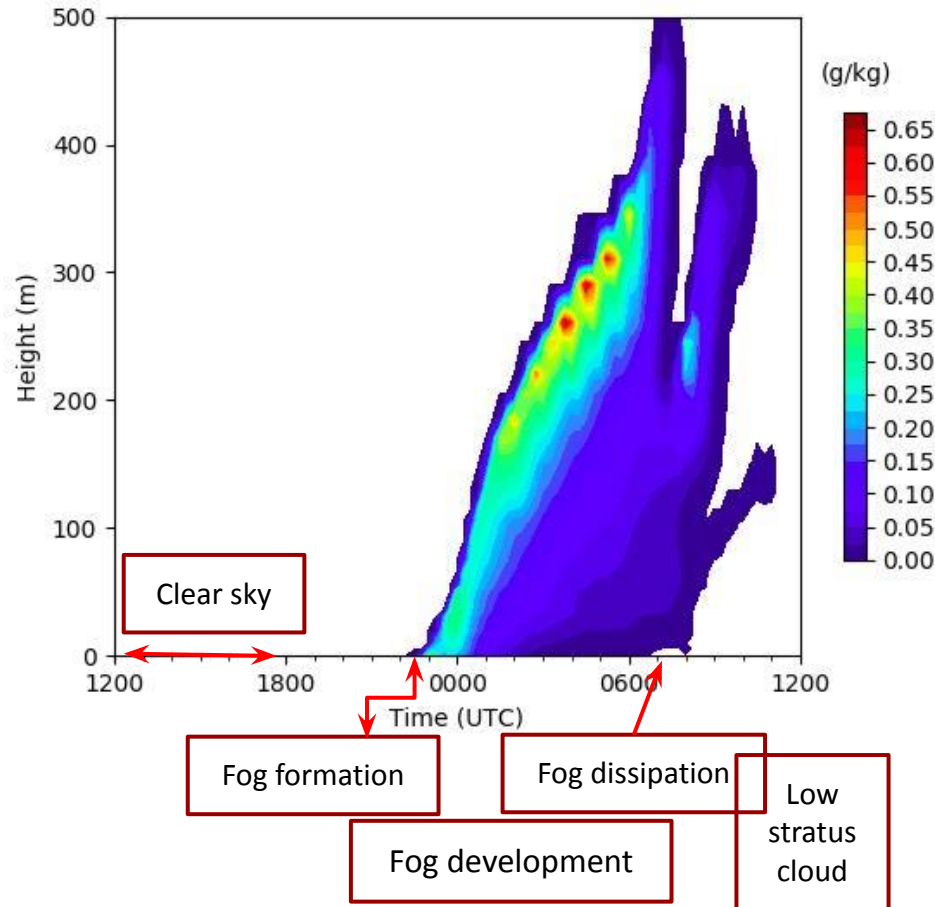


Presentation of the study

- Estimation of radiation fluxes and heating rates using the 1D radiation model of the CFD code: code_saturne v7.0
- Measurements during the campaign ParisFog at Palaiseau in the south of Paris area [1]
- Simulation ran from 18 Feb 2007 12h UTC to 19 Feb 12h UTC



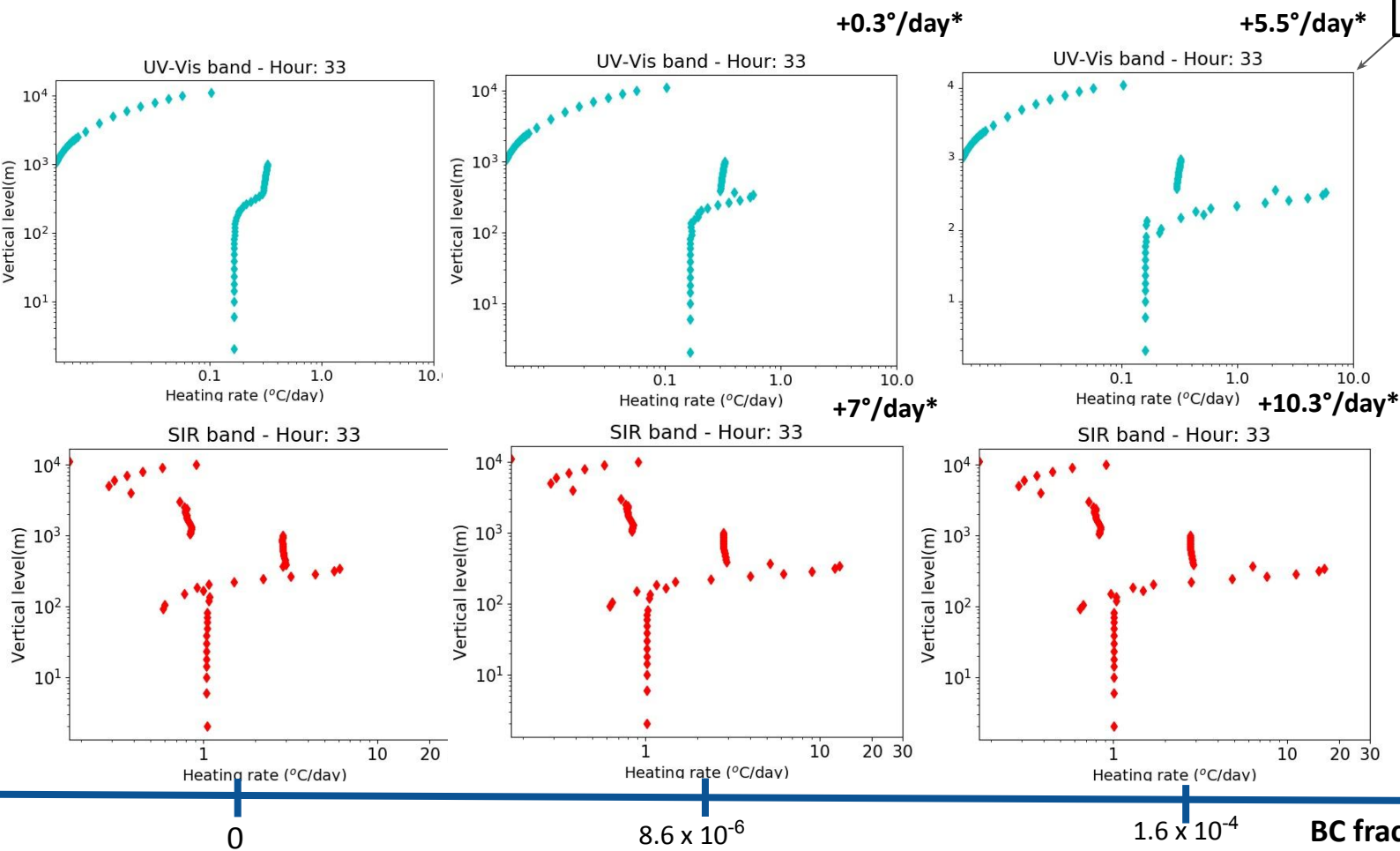
[1]Haeffelin, M., T. Bergot, T. Elias, R. Tardif, D. Carrer, P. Chazette, M. Colomb, et al. "Parisfog: Shedding New Light on Fog Physical Processes." *Bulletin of the American Meteorological Society* 91, no. 6 (June 1, 2010): 767–83.

<https://doi.org/10.1175/2009BAMS2671.1>.

Fig: Liquid water path field from 18 Feb 2007 12h UTC → 19 Feb 2007 12h UTC

Figures: Heating rate in the layers in the Ultra Violet - Visible (UV-Vis) and Solar Infra Red (SIR) spectral bands for different volume fraction of BC in cloud droplets - 19 Feb at 9h UTC

Absorption by the UV-Vis band becomes significant !



Conclusion

Black Carbon (BC) fraction increases
 → heating rate increases
 → liquid water reduced
 → faster dissipation of fog
 → higher surface fluxes:
 Up to 116.8 W m^{-2} for the direct component at 10h am

**Increase at the top of the fog where liquid water is maximum and compared to the version with no BC*