

## Short report about 11th Air Quality Conference

My experience at the 11th Air Quality Conference that took place in Barcelona from March 12th to 16th 2018 was extremely edifying.

My presentation entitled: “PM10 and Black Carbon vertical profiles in two Italian valleys: analysis of measurements and high resolution modelling” took place on Thursday, March 15th in the afternoon, in the session “Development, application and evaluation of air quality related models” with chairs John Bartzis and Bruce Denby. The objective of our study is to analyze the trend of the vertical profile of PM10 and black carbon (BC) in the Italian valleys, to explain their production / loss / transport linked to the local meteorological circulation.

- I first presented the sites and their critical issues derived from the meteorology and geomorphology. The study I presented involved only two Italian cities that are located in two valleys: Milan in the Po Valley and Terni in the Val Nerina. The valleys have been studied in a data acquisition campaign which took place in 2010. I located the position of the industries with respect to the city as a potential source of PM10 and Black Carbon.
- I presented the acquired dataset: the data of the vertical profiles produced by the campaign acquired a filled tethered balloon; data of the variables at the ground taken from the weather stations, daily PM10 data produced by environmental agencies in the area.
- I first presented the results of the comparison of the model and the meteorological variables on the ground and the time series of the PM10. The models used are WRF for the meteorological component and CHIMERE for chemistry.
- I compared the results of the 1 km resolution model vertical profiles with the profiles of Temperature and Relative Humidity, in order to verify the presence of thermal inversions and the stagnation of pollutants.
- I compared the results of the vertical profiles of PM10 and BC measured with the profiles produced by the model, making a normalization of the results since the profiles produced by the model reflected the measured, both from the point of view of concentrations and trend.
- In conclusion, these preliminary results are encouraging, but there are still several tests to be done, for example by changing the PBL scheme or by infilling the levels close to the ground in order to improve accuracy, for example in the identification of thermal inversions.

My discussion was followed by five questions: two concerning the normalization of Black Carbon and PM10 profiles, two other questions regarding the methods of acquisition and the tools used, in particular the micro-aethalometer used to acquire black carbon. The last question specifically concerned the model, talking about the emissions database used to initialize the model.

For what concern the conference in general, I think it was very interesting and well organized. The chosen place was perfect, really equipped with every comfort. The University that welcomed us had several areas where we could work or study.

During the conference I followed with great interest the talk of Xavier Querol on vertical profiles acquired with the same methodology that we used to detect ozone and the ultra fine particles, very interesting the results about the correlation between ozone concentration peaks and height of PBL and the presence of land breezes. The talk by Riccardo Bruccolieri on small scale models concerning the pollutant dispersion in street canyon was very interesting for the

topic. I found interesting the work of Gian Paolo Gobbi about measurements on the port of Civitavecchia, this study is linked to the results from WRF- CHIMERE simulations presented in a poster by Gabriele Curci. I liked very much the talk about themes similar to mine: the talks of Cristina Carnerero and Heino Kuuluvainen, especially the latter because even in my department we want to take measurements of vertical profiles through drones. It was very interesting to compare the results of the black carbon concentrations derived from my analysis with the studies carried out by Mohammad Aziz in three Swedish cities. Also it was nice to listen Alberto Martilli as developers of the most popular urban canopy parametrizations in WRF.