

## ***Interactive comment on “Impacts of air pollution and climate on materials in Athens, Greece” by J. Christodoulakis et al.***

### **Anonymous Referee #1**

Received and published: 27 June 2016

Review of the manuscript entitled "Impacts of air pollution and climate on materials in Athens, Greece" by J. Christodoulakis, C.G. Tzanis, C.A. Varotsos, M. Ferm, J. Tidblad

This paper presents and discusses corrosion/soiling experimental results of different materials (carbon and weathering steel, copper, zinc, limestone, modern glass) due to air pollution, together with climatic parameters, obtained during different one year exposure periods performed at Athens, Greece, since 2003. The authors also present/compare their results with corrosion/soiling estimations obtained using Dose Response Functions (DRFs for multi-pollutant situation) already presented in the literature and propose new DRFs targeted to Athens, Greece. The paper addresses relevant scientific questions within the scope of Atmospheric Chemistry and Physics journal. The overall presentation is also well structured and clear, and the conclusions are substantial. This manuscript is interesting because it presents new DRFs for dif-

C1

ferent materials based on the new atmospheric multi-pollutant situation and climatic parameters at Athens, Greece. Therefore, I recommend publication of this paper after a few minor comments have been addressed. I would also like to notice that authors have taken into account all the comments made in my previous report.

Specific comments:

1. Page 1, line 13: Use capital for the initial letters of the words “dose response functions”.
2. Page 1, line 14: “Dose” instead of “dose”, “Response instead of “response”.
3. Page 1, line 15: “Function” instead of “function”.
4. Page 2, line 5: As before use capital for the initial letters of the words “dose response functions”.
5. Page 2, line 26: Here it is referred that “sheltered samples” are exposed in the box under the rack while in the same page, line 29 is referred that only modern glass sample is exposed there. Please clarify.
6. Page 3, line 16: “. . . structural metals/alloys” instead of “. . . structural metals”.
7. Page 3, line 20: “. . . structural metal/alloy” instead of “. . . structural metal”.
8. I would suggest authors to unify figures where applicable, for example figs. 2 and 3, figs. 4 and 5, figs. 6 and 7, figs. 9 and 10.
9. Page 4, line 6: “. . . sensitive alloys” instead of “sensitive metals”.
10. Page 5, line 7: Be consistent with the “Dose Response Function” term.
11. In each given equation, with a few exceptions (Eqs. 4, 6, 10), there is a constant factor, meaning that even in case all other factors were zero there will be corrosion on materials. Could you please give an explanation about this?
12. Page 6, lines 31-33: Give the meaning of these terms in the same way as for the

C2

case of HNO<sub>3</sub> in Page 7, line 1. Erase the terms “annual average”.

13. Page 6, line 34: Erase the term “annual average”.

14. Page 7, line 15: “DRF (Eq. 3) estimations” instead of “DRFs estimations”.

15. Page 7, lines 18-23: Specify which equation (equation number) is considered for each material.

---

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-196, 2016.