**Anonymous Referee #2**

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The paper discusses the reconstruction and analysis of 50-year time series of Erythemal UV radiation (UV-Ery) over the central European station Hradec Králové. The paper also addresses the connection of UV-Ery long-term changes (examining also the evolution of high UV-Ery doses) to large circulation patterns over Europe. The statistical methods applied are well suited for this type of analysis, and the paper contains new material. However, the paper needs minor improvements before accepted for publication.

The way the statistical methods are applied and the quantities used are not clearly described, and in some paragraphs may be even confusing. For example, in Page 1, line 18 (Abstract) it is written that "the number of days with very high EUV radiation increased by 22% per decade", a statement that cannot be easily deduced by either the description of methods (paragraph 4) or the discussion in the relevant paragraph (5.3).

Specific comments:

1. Page 3, lines 24-26: Is it possible to give an indication of the number of missing observations
   *Added to the text.*

2. Page 4, lines 7-8 (3.1.2 AOD): The meaning of this last sentence is not clear. Do you mean that the number of data available for the calculation of the AOD320 climatology was 61% of the total?

   *Yes, the time series was completed from 61 % (61 % of days had data). To avoid confusion, the formulation was changed accordingly in the text.*

3. Page 5, lines 25 – 30: Please give more details. Is there a reference you can give here? Last line (30-31): "To obtain the best fit function.." Where is this best-fit function used?

   *A reference for the Cloud Modification Factor calculation was added to the text (p. 5, l. 25–26). The use of multiple non-linear regression was also described in more detail, including the precise formula we used (p. 5–6, l. 31, 1–4).*

4. Page 6 line 1: Please change "The verification.." to "The validation.."
   *Changed accordingly.*

5. lines 3-4: "used to develop the model and the second..." Which model are you referring to here? LibRadtran? Please clarify.

   *We mean the multiple non-linear regression model that was used to estimate the all-sky EUV irradiance. Clarification added to the text.*

6. line 30: "because 1995 was the year when the long-term ozone lowering stopped" It is better to write "because stratospheric (or total) ozone reached its minimum in 1995 over Europe"
   *Changed accordingly.*

7. Page 7 line 8: typo "or" -> "of"
   *Changed accordingly.*

8. line 8: "..therefore, low cloud cover was specified this way". Do you mean that the threshold for low cloud cover was set to 4 octas or less?
   *Yes, clarified in the text.*

9. lines 10-15: Please give the period you used from the NCEP reanalysis
   *The whole 50-years period 1964–2013, added to the text.*

10. line 15: Why do you use both indices? They are not independent from each other. See also comment below
    *Answered together with comment no. 14.*

11. Page 8-9, Par. 5.2, and in connection to Figure 3. Please correct or discuss why this is done this way the figure. Are the correlation coefficients you found and discuss negative or positive? The text says negative, while the figure suggests otherwise.

    *The correlation coefficients are of course negative in all three cases, fig. 3 was corrected.*

12. Page 9, paragraph 5.3: There is no clear description of the methods you used here, nor a clear description of what Figure 4 presents and how it was calculated. Here you discuss only days with high erythemal dose, not all available days. It seems that this is a result of partial correlation performed separately on the EUV90 or how was it done?

    *The days with high erythemal doses ($EUV_{90+}$) were selected based on the 90$^{th}$ percentile of each months, an explanation and the thresholds for each month are provided in sect. 4 (Table 3; p. 7, l. 7–9). The same section also describes the factors used to explain the days with $EUV_{90+}$ (p. 7, l. 9–14). The selected days were then explained based on the given thresholds of the factors and the number of days with $EUV_{90+}$ together with the explanatory factors was plotted into fig. 4. A cross-link to Methodology section was added to the text (p. 10, l. 10).*

13. How was the number referred to in the Abstract (22% per decade increase in the number of days) calculated?

    *It was a linear trend analysis of the number of days with EUV90+ throughout the whole study period. This number, together with the error bars, was added to the text in sect. 5.3 (p. 10, l. 4–9).*

14. Page 10, lines 8 and below: Why do you use separately NAO and AO for your table 5 correlations? Do you have an explanation as to their individual effects and why they should be examined separately? They are very closely connected, and there is no need to present both. It is better to discuss the effects as joined, as you do in the rest of the paragraph with the PCA analysis.

    *The NAO and AO indices are highly correlated but they are linked to slightly different processes in atmosphere. AO is more pole-centered and it is linked mainly to Arctic polar vortex, while NAO is related mainly to see-saw variability of the Icelandic Low and Azores High pressure regions. For this reason the influence of AO and NAO on Central European region may be different in different seasons. (Added to the text in Sect. 4, p. 7, l. 21–24, with relevant citations).*