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Interactive comment on "Trends and source apportionment of aerosols in Europe during 1980–2018" *by* Yang Yang et al.

Anonymous Referee #1

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The study by Yang et al., attempted to quantify the contribution of major source regions in the world towards aerosol loading in Europe. The study has certain flaws which needs to be addressed before it can be accepted for publication at ACP. Line 163: Any specific reason on why future DRF due to aerosols other than sulphate was not estimated in this study for future. If not, I would suggest doing the same. Line 175: Why was nitrate and ammonium aerosols were not considered in this study? I would suggest including nitrate at least. Line 218: I would strongly suggest to not compare the sum of BC,OC and sulphate with PM2.5 from observations until aeolian dust, sea salt, nitrate and ammonium are presented/simulated. Additionally, I feel it is meaningless to compare the model AOD (without components like nitrate, ammonium) with AERONET. Line 220: Any specific reasons on why the model does not have the capability to simu-

late ammonium and nitrate aerosols. I strongly suggest the authors to include a section on seasonal source-receptor relationship for Europe supported by meteorological factors (like wind directions). I understand it is computationally expensive to carry out this for all the years considered in the study. However, performing seasonal analysis for a single representative year would suffice.