

## **1.060 An investigation of possible roles of atmospheric circulation on annual visibility in Pearl River Delta, southern China.**

Early Career Scientist

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Abstract:

We investigate annual variations of visibility in Pearl River Delta (PRD) region from 1973 to 2017 and their relationship between atmospheric circulations based on daily records from Global Summary of the Day (GSOD) database and NCEP/NCAR reanalysis data. In general, the annual visibility in PRD has decreased from 1973 to 2017, however there is a significant improvement in visibility since 2007. According to the spatial distribution of correlation coefficients, six atmospheric circulation indices are defined from the key areas in sea level pressure, zonal and meridional winds at 850 hPa, geopotential height field at 500 hPa, zonal wind at 200 hPa, and air temperature at 200 hPa, respectively. These six circulation indices together can explain 79.1% variance of the visibility in the year-to-year variability, thus a statistical model is established between visibility and atmospheric circulation indices. Furthermore, the visibility in the future under different scenarios is calculated based on those indices derived from Coupled Model Intercomparison Project Phase 5 (CMIP5) model simulations. It is vital for government decision makers to take long-term action in dealing with the improvement in air quality in PRD indicated by the atmospheric circulation conditions.