



## **Global dimming and urbanization: did stronger negative SSR trends collocate with regions of population growth?**

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Global dimming refers to the decrease in surface solar radiation (SSR) observed from the 1960s to the 1980s at different measurement sites all around the world. It is under debate whether anthropogenic aerosols emitted from urban areas close to the measurement sites are mainly responsible for the dimming. In order to assess this urbanization impact on SSR, we use spatially explicit population density data of  $0.08^\circ$  resolution to construct population indices (PI) at 157 high data quality sites. Our study extends previous population-based studies by incorporating distance-weighting as a simple aerosol diffusion model. We measured urbanization in the surrounding of a site as the PI change from 1960 to 1990 and found no negative correlation with the corresponding SSR trends from 1964 to 1989 for the 92 sites in Europe and Japan. For the 39 sites in China the correlation coefficients are significant at the 5 % level and reach around  $-0.35$ , while for the 26 remaining Asian, mostly Russian sites the correlation coefficients reach around  $-0.55$  at the 1 % significance level. Results are similar, when the absolute levels of PIs are taken as an indicator for urbanization. Our findings call into question the existence of an urbanization effect for the sites in Europe and Japan, while such an effect cannot be ruled out for the sites in Asia, especially in Russia.