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## Evidence for clear-sky dimming and brightening in the long-term Potsdam radiation record

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For the explanation of the observed decadal variations in surface solar radiation (known as dimming and brightening) the relative importance of clouds and the cloud-free atmosphere (particularly aerosols) is currently disputed. Here we investigate this issue using daily data from the prominent long-term observational radiation record at Potsdam, Germany, over the 71-years period 1947-2017. We identify cloud-free days based on synop cloud observations as well as on days with maximum atmospheric transmission. Irrespective of the cloud-screening method, strong dimming and brightening tendencies in the atmospheric transmission are evident not only under all-sky, but also of similar magnitude under clear-sky conditions, causing multidecadal variations in surface solar radiation on the order of  $10 \text{ Wm}^{-2}$ . This points to the cloud-free atmosphere as a main responsible for dimming and brightening in Central Europe and suggests that these variations are anthropogenically forced rather than of natural origin, with aerosol pollutants as likely major drivers.

This study has been published in *Geophysical Research Letters* (Wild et al. 2021)

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