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A global emission inventory of carbonaceous aerosol from historic records of fossil fuel and biofuel consumption for the period 1860–1997

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Abstract. Country by country emission inventories for carbonaceous aerosol for the period 1860 to 1997 have been constructed on the basis of historic fuel production, use and trade data sets published by the United Nation's Statistical Division UNSTAT (1997), Etemad et al. (1991) and Mitchell (1992, 1993, 1995). The inventories use emission factors variable over time, which have been determined according to changes in technological development.

The results indicate that the industrialisation period since 1860 was accompanied by a steady increase in black carbon (BC) and primary organic carbon (POC) emissions up to 1910. The calculations show a moderate decrease of carbonaceous aerosol emissions between 1920 and 1930, followed by an increase up to 1990, the year when emissions began to decrease again.

Changes in BC and POC emissions prior to the year 1950 are essentially driven by the USA, Germany and the UK. The USSR, China and India become substantial contributors to carbonaceous aerosol emissions after 1950.

Emission maps have been generated with a $1^\circ \times 1^\circ$ resolution based on the relative population density in each country. They will provide a helpful tool for assessing the effect of carbonaceous aerosol emissions on observed climate changes of the past.

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