

Modelling the BC deposition in Arctic ice-cores by source–receptor matrix calculation for deposited mass with FLEXPART

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We extended the backward modelling technique to substances deposited at the Earth's surface by wet scavenging and dry deposition in the Lagrangian particle transport model FLEXPART. This facilitates efficient calculation of emission sensitivities for deposition quantities at individual sites, which opens new application fields such as the comprehensive analysis of measured deposition quantities, or of deposition recorded in snow samples or ice cores. Calculations for black carbon and sulfate for 9 Arctic ice cores for the years 1900-1999 have been performed with this model framework. By combining it with the CMIP6 emission it can be shown that the model fits the observations quite well, even though the concentrations are over estimated by the model. Depending and location and altitude of the measurement sites the levels of black carbon vary significantly. We will show the relation to the source regions as well as the sensitivity to important anthropogenic and natural emissions.