



Particle emissions from biomass burning

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The particle emissions from wildfires have a large impact on both climate and air quality. Biomass burning particles are mainly internally mixed and contain a large amount of water soluble compounds, increasing the probability of activation as cloud condensation nuclei (CCN). Only the fine particles are included in this study, as the coarse particles are only few, i.e., do not have a large impact on cloud formation and also are not related to the same parameters as the fine particles.

The aim of this on-going study is to parameterize the emissions of particle number from biomass burning, with a focus on wildfires. We have compiled and analysed a large amount of literature data, and related particle emissions to carbon monoxide emissions as well as to the combustion efficiency, forming an emission model.

As the particle size distribution changes rapidly during the first hour after emission, and is affected by many parameters, the aging process has also to be taken into account in an emission model. Due to the low availability of particle number emission data from wildfires, comparisons have been made also with particle mass emissions for fine particles.

For particle number emissions we recommend using average emission factors of either 2×10^{15} per kg dry fuel, 25×10^{12} per gram carbon monoxide or 30 particles per cm^3 and ppb carbon monoxide. The variation between different fires is large and the results need to be tested by measurements and within models to be verified.

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