

Local *versus* regional haze events as indentified by radiocarbon and molecular marker analysis of carbonaceous aerosols in an urban environment

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Regional biomass burning injects enormous amount of gasses and particles into the atmosphere. It is regarded as an important biogeochemical processes even at global scale, and poses significant impact on regional atmospheric environment. Biomass burning contributes to both the direct emission of primary organic aerosol (POA) and the formation of secondary organic aerosol (SOA) in the atmosphere, and has been identified to be an important source of air pollution or even haze events in Chinese large cities. Radiocarbon analysis is a powerful tool in tracking the carbon source of aerosols, which, along with organic molecular markers such as levoglucosan, could provide critical information for the source apportionment of air particulates. A series of methodologies were developed in GIGCAS for the isolation of organic carbon (OC) and element carbon (EC) in aerosol for radiocarbon analysis, and were applied in the source apportionment of carbonaceous aerosols in 2 background sites and several large cities in China. Here we report the results in Guangzhou, the largest city in South China, which demonstrate the probability of using radiocarbon and molecular tracers to identify local and regional haze events.