

5.078 Challenges in Identifying Sources of PM_{2.5} in China.

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Abstract:

Identify sources of haze is very important in China due to frequent occurrence of haze in recent years. This study presents the current tools that are applied for studying sources of PM_{2.5}. These tools include receptor model, chemical transport model, emission inventory, isotopes such as ¹⁴C, satellite, and sensor network. Each tool could provide useful information to understand major source types and quantify source contributions. However, it remains a great challenge when results from different methods are compared and it is even more challenging when one tries to integrate results from different methods. In this study, using Beijing as an example, we are investigating and discussing how to effectively integrate results from different methods in studying PM_{2.5} sources.

Although PM_{2.5} source apportionment studies are actively ongoing in multiple cities in China, major challenges still exist and need to be addressed. These challenges are mainly in four areas including the accuracy of source apportionment results, distinguishing primary emissions from secondary formation, identifying local vs. regional contribution, and time resolution (Zheng et al., 2017). For the issue of accuracy, the key is whether the traditional tracers are specific for China such as levoglucosan and K for biomass burning source (Yan et al., 2018). As current source apportionment work relies heavily on receptor model, therefore, to clearly distinguish local from regional transport remains a challenge. The challenge in time resolution leads to active and wide application of online measurements in China. However, how to integrate online data from different instruments and automatically evaluate the accuracy of source apportionment results is also a challenge.