Supplementary Materials:

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**Table S1.** Sampling time and weather conditions at three sampling sites in Baoshan.

Season	Sampling time	Sampling sites			Weather	Concentration of PM$_{2.5}$（μg·m^{-3}）	Air temperature(℃)
		EMS	BSC	AA			
Wet season	**13/6/2016-14/6/2016,(22±1h)**	**Y**	**Y**	Y	Light rain	20.87	18-24
	14/6/2016-15/6/2016,(22±1h)	Y	Y	Y	Light rain	21.24	17-25
	15/6/2016-16/6/2016,(22±1h)	Y	Y	Y	Light rain	17.19	18-26
	16/6/2016-17/6/2016,(22±1h)	N	N	N	Light rain	-	18-23
	17/6/2016-18/6/2016,(22±1h)	Y	Y	Y	Light rain	16.53	18-24
	18/6/2016-19/6/2016,(22±1h)	Y	Y	Y	Shower	7.03	18-26
	19/6/2016-20/6/2016,(23±1h)	Y	Y	Y	Light rain	7.05	18-21
	20/6/2016-21/6/2016,(22±1h)	Y	Y	Y	Light rain	8.05	19-24
	21/6/2016-22/6/2016,(22±1h)	Y	Y	Y	Light rain	7.49	19-22
	22/6/2016-23/6/2016,(22±1h)	Y	Y	Y	Moderate rain	8.88	18-22
	23/6/2016-24/6/2016,(22±1h)	Y	Y	Y	Light rain	11.56	19-25
	23/6/2016-24/6/2016,(22±1h)	Y	Y	Y	Light rain	11.43	19-23
	25/6/2016-26/6/2016,(22±1h)	Y	Y	Y	Light rain	10.26	19-27
	26/6/2016-27/6/2016,(22±1h)	Y	Y	Y	Light rain	13.55	19-27
	27/6/2016-28/6/2016,(22±1h)	Y	Y	Y	Light rain	13.86	19-27
Dry season	9/11/2016-10/11/2016,(22±1h)	Y	Y	Y	Cloudy	24.56	14-23
	10/11/2016-11/11/2016,(22±1h)	Y	Y	Y	Cloudy	36.43	12-23
	11/11/2016-12/11/2016,(22±1h)	Y	Y	Y	Clear	32.24	9-23
	12/11/2016-13/11/2016,(22±1h)	Y	Y	Y	Cloudy	24.21	10-23
	13/11/2016-14/11/2016,(22±1h)	Y	Y	Y	Cloudy	32.18	10-22
	14/11/2016-15/11/2016,(22±1h)	Y	Y	Y	Cloudy	38.77	9-23
	15/11/2016-16/11/2016,(22±1h)	Y	Y	Y	Cloudy	32.82	9-23
	16/11/2016-17/11/2016,(22±1h)	Y	Y	Y	Cloudy	39.53	8-23
	17/11/2016-18/11/2016,(22±1h)	Y	Y	Y	Cloudy	36.56	8-22
	18/11/2016-19/11/2016,(22±1h)	N	N	N	Clear	-	8-23
	19/11/2016-20/11/2016,(22±1h)	Y	Y	Y	Clear	27.50	6-22
	20/11/2016-21/11/2016,(22±1h)	Y	Y	Y	Clear	33.47	6-22
	21/11/2016-22/11/2016,(22±1h)	Y	Y	Y	Clear	45.03	6-22
	22/11/2016-23/11/2016,(22±1h)	Y	Y	Y	Clear	41.01	6-22
	23/11/2016-24/11/2016,(22±1h)	Y	Y	Y	Clear	38.04	6-21

Y:Sampling
N:No sampling

Table S2. Percent of bootstrap factors mapped back to the original PMF factors from the four-factor PMF solution in the wet season.

Factor	% Bootstrap factors mapped to original PMF factors
Road dust	90
Biomass combustion and sea salt	90
Metal smelting Road dust	99
Fossil fuel combustion and secondary inorganic particles	88

As shown in the figure 1,Output of the bootstrapping analysis consisting of box whisker plots of species for each profile: a) Road dust, b) Biomass combustion and sea salt, c) Metal smelting and d) Fossil fuel combustion and secondary inorganic particles; The box shows the interquartile range (25th-75th percentile) of the bootstrap runs. The horizontal green line represents the median bootstrap run and the red crosses represent values outside the interquartile range. The base run is shown as a blue box for reference. In this study, 100 bootstrap runs were performed for the final PMF results。


a)

b)

c)

d)
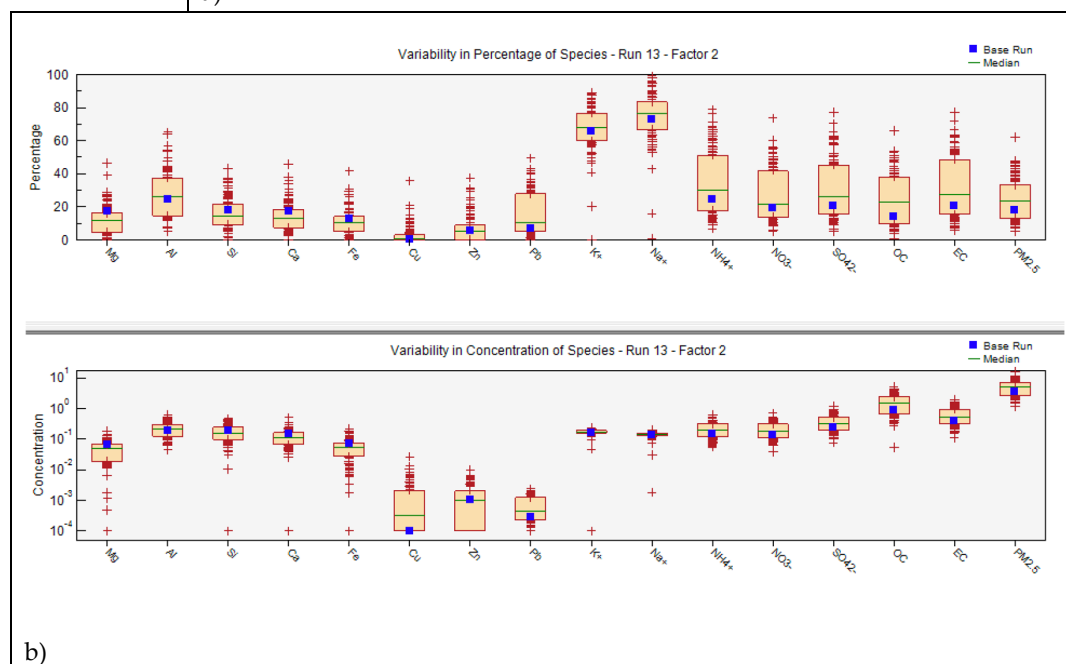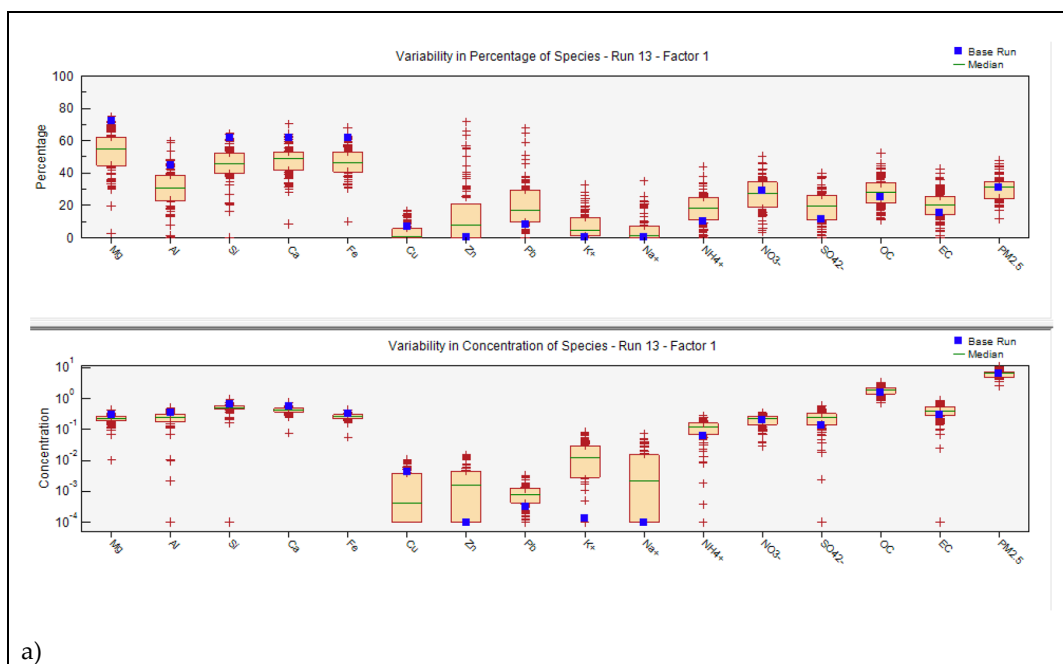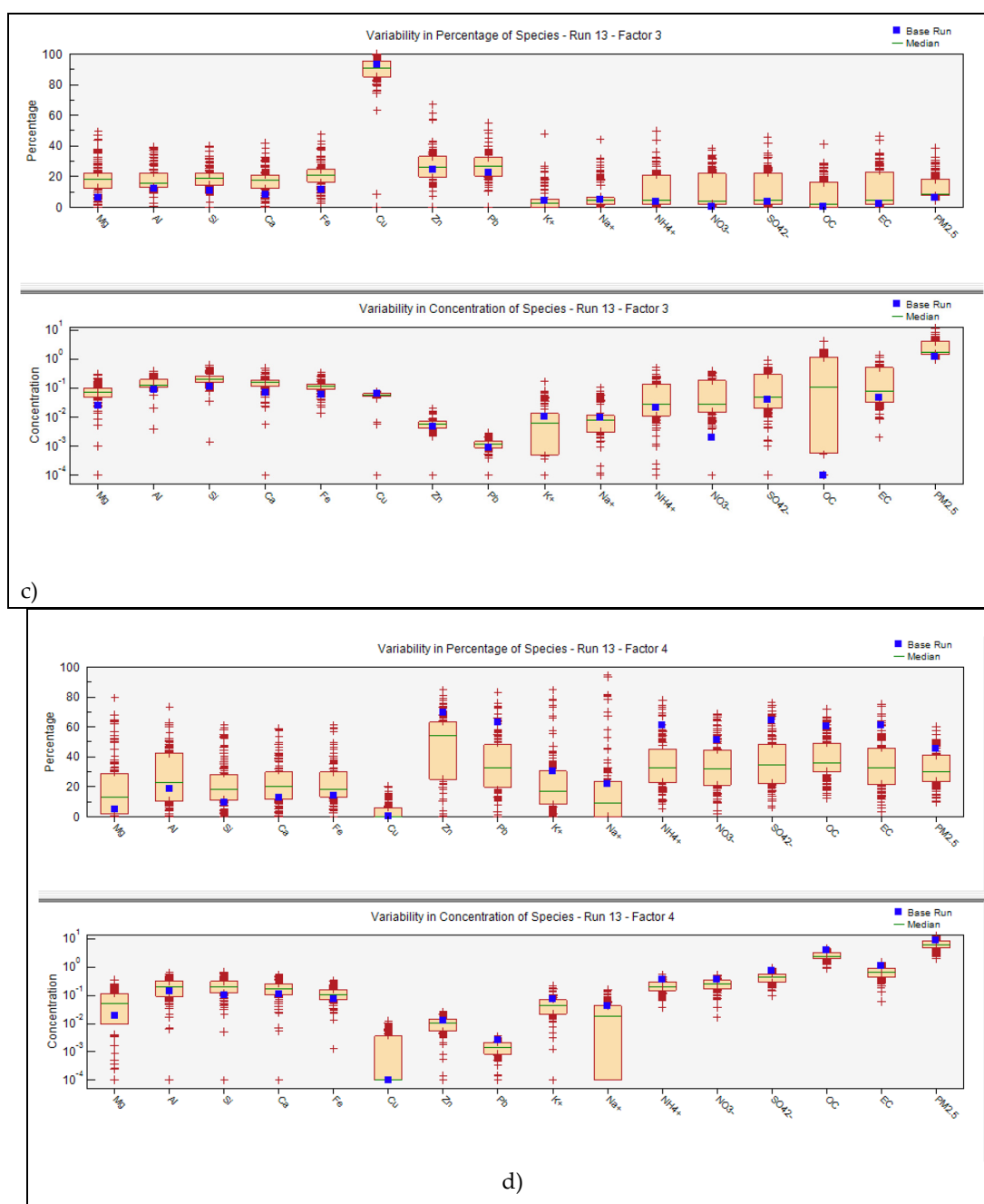
Figure S1. Output of the bootstrapping analysis in the wet season.

Table S3. Percent of bootstrap factors mapped back to the original PMF factors from the four-factor PMF solution in the dry season**.**

Factor	% Bootstrap factors mapped to original PMF factors
fossil fuel combustion	97

biomass combustion and secondary inorganic particles	100
metal smelting	85
road dust	97

As shown in the figure 2,Output of the bootstrapping analysis consisting of box whisker plots of species for each profile: a) Fossil fuel combustion, b) Biomass combustion and secondary inorganic particles, c) Metal smelting and d) Road dust ; The box shows the interquartile range (25th-75th percentile) of the bootstrap runs. The horizontal green line represents the median bootstrap run and the red crosses represent values outside the interquartile range. The base run is shown as a blue box for reference. In this study, 100 bootstrap runs were performed for the final PMF results。

a)

b)
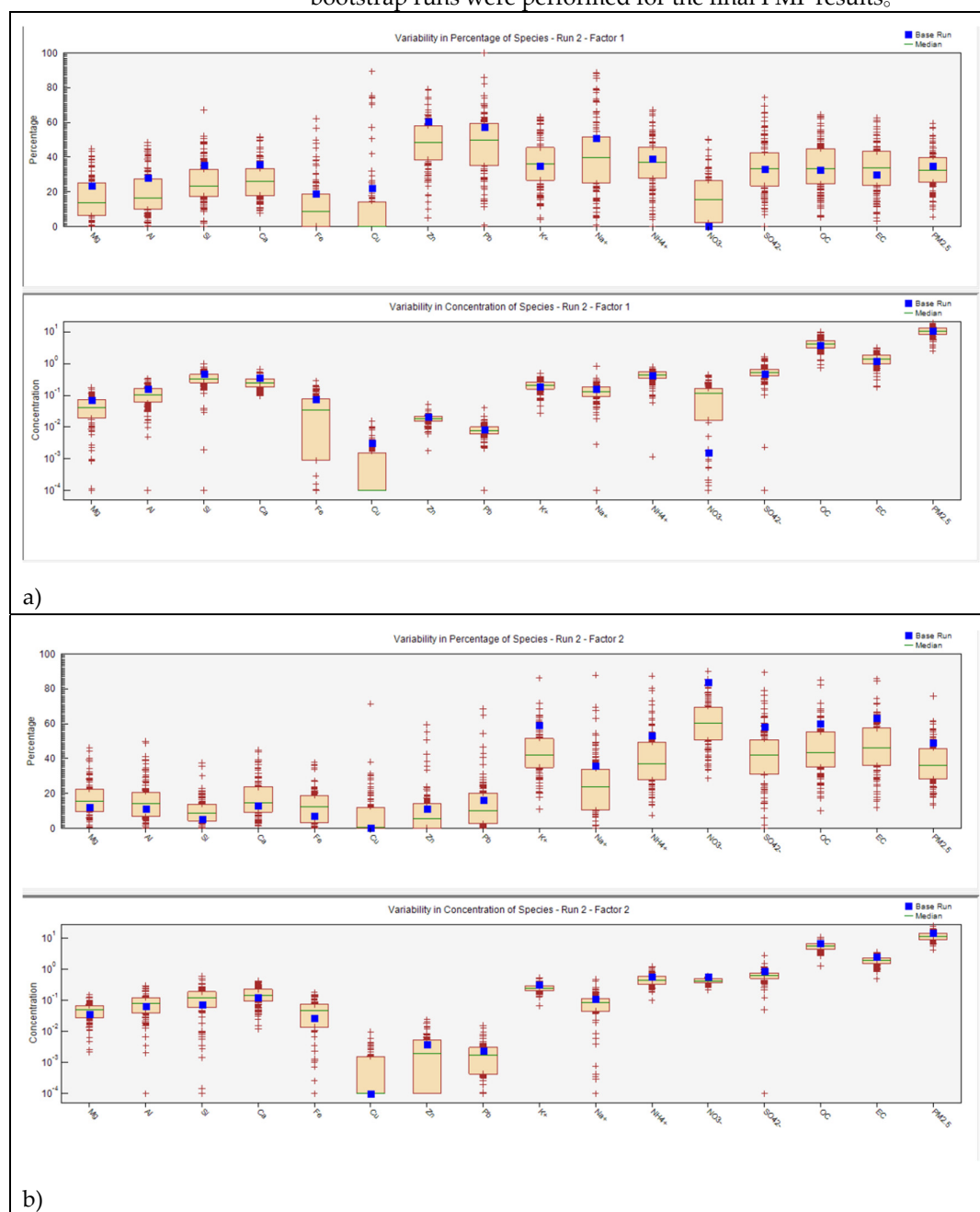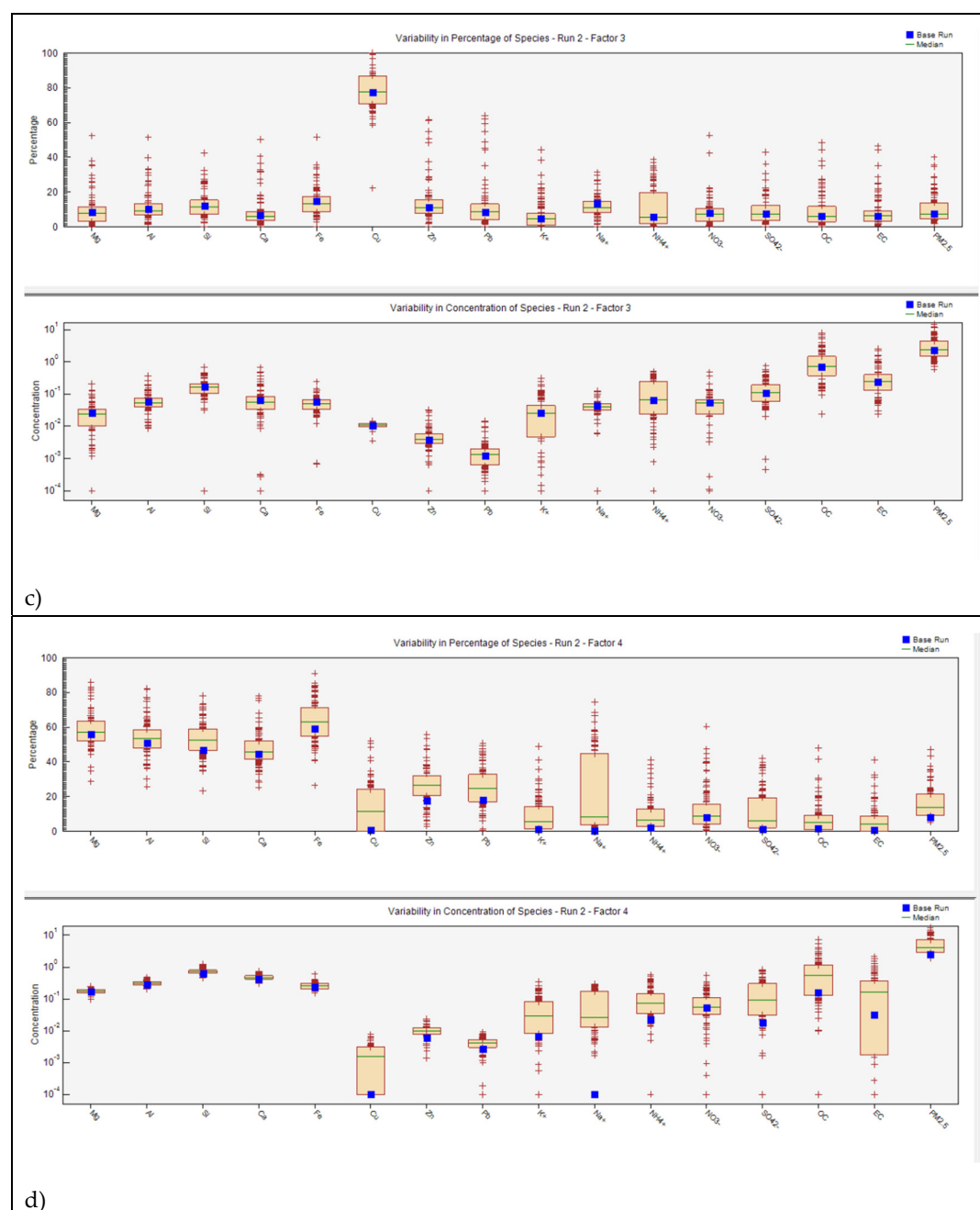
Figure S2. Output of the bootstrapping analysis in the dry season.