

Simulations	Case	Aerosol number concentration at the surface ( $\text{cm}^{-3}$ )	Micro-physics scheme	Resolution	Saturation	Sedimentation	Collection
High-aerosol-Seoul run	Seoul	5500	Bin	500 m	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-Seoul run	Seoul	550	Bin	500 m	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-Houston run	Houston	1500	Bin	500 m	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-Houston run	Houston	150	Bin	500 m	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-15-Seoul run	Seoul	5500	Bin	15 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-15-Seoul run	Seoul	550	Bin	15 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-15-Houston run	Houston	1500	Bin	15 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-15-Houston run	Houston	150	Bin	15 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-35-Seoul run	Seoul	5500	Bin	35 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-35-Seoul run	Seoul	550	Bin	35 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-35-Houston run	Houston	1500	Bin	35 km	Supersaturation prediction	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-35-Houston run	Houston	150	Bin	35 km	Supersaturation prediction	MG-scheme sedimentation	MG-scheme collection
High-aerosol-MG-Seoul run	Seoul	5500	MG	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
Low-aerosol-MG-Seoul run	Seoul	550	MG	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
High-aerosol-MG-Houston run	Houston	1500	MG	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
Low-aerosol-MG-Houston run	Houston	150	MG	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
High-aerosol-sat-Seoul run	Seoul	5500	Bin	500 m	Saturation adjustment	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-sat-Seoul run	Seoul	550	Bin	500 m	Saturation adjustment	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-sat-Houston run	Houston	1500	Bin	500 m	Saturation adjustment	Bin-scheme sedimentation	Bin-scheme collection
Low-aerosol-sat-Houston run	Houston	150	Bin	500 m	Saturation adjustment	Bin-scheme sedimentation	Bin-scheme collection
High-aerosol-sed-Seoul run	Seoul	5500	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	Bin-scheme collection
Low-aerosol-sed-Seoul run	Seoul	550	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	Bin-scheme collection
High-aerosol-sed-Houston run	Houston	1500	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	Bin-scheme collection
Low-aerosol-sed-Houston run	Houston	150	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	Bin-scheme collection
High-aerosol-col-Seoul run	Seoul	5500	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
Low-aerosol-col-Seoul run	Seoul	550	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
High-aerosol-col-Houston run	Houston	1500	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection
Low-aerosol-col-Houston run	Houston	150	Bin	500 m	Saturation adjustment	MG-scheme sedimentation	MG-scheme collection