

Characteristics	Description
Model version	COSMO5.1-ART3.1
Time period	2–3 July 2016, 6–7 July 2016
Simulation domain	9.0° W–4.4° E, 3.0–10.8° N
Grid mesh size	2.5 km (0.0223°)
Vertical levels	80 up to 30 km (28 in the lowest 1.5 km a.g.l.)
Meteorological boundary and initial data	COSMO-ART (5 km grid mesh size using ICON operational forecasts from DWD)
Pollutant boundary and initial data	COSMO-ART (5 km grid mesh size using MOZART, 2017) GlobCover (2009) land use data CCSM (2015) plant functional types
Cloud microphysics	Two-moment microphysics scheme (Seifert and Beheng, 2006)
Pollutant emissions	Mineral dust (online): Rieger et al. (2017) using HWSD (2012) Sea salt (online): Lundgren et al. (2013) DMS (online): using Lana et al. (2011) BVOCs (online): Weimer et al. (2017) Biomass burning (prescribed and online): Walter et al. (2016) using GFAS (CAM5, 2017) Anthropogenic (prescribed): EDGAR (2010) Gas flaring (prescribed): Deetz and Vogel (2017)
Aerosol dynamics	MADEsoot (Riemer et al., 2003; Vogel et al., 2009) Secondary inorganic aerosol: ISORROPIA II (Fountoukis and Nenes, 2007) Secondary organic aerosol: VBS (Athanasopoulou et al., 2013)
Chemical mechanisms	Gas-phase chemistry: RADMKa (Vogel et al., 2009)
ALWC	Anthropogenic aerosol: ISORROPIA II (Fountoukis and Nenes, 2007; Stokes and Robinson, 1966) Sea salt: Lundgren et al. (2013) Fresh soot: Riemer (2002)
Aerosol direct effect (ADE)	Vogel et al. (2009)
Aerosol indirect effect (AIE)	Warm phase: Bangert (2012) and Fountoukis and Nenes (2005) Cold phase: Philipps et al. (2008)