

Parameter	Source	Remarks
Radiance and irradiance	GOME-2A	data between latitudes 52 and 60° and longitudes 29 and 45° (255 pixels)
Solar and satellite geometry	GOME-2A Level 1-b data	
Surface albedo A_s	Tilstra et al. (2017)	GOME-2A LER at 1° × 1° grid at 758 and 772 nm
Surface pressure p_s	ERA-Interim	
Temperature pressure profile	ERA-Interim	
Aerosol optical thickness τ		state vector element, a priori = 1.0
Aerosol layer height h_{mid} (km)		state vector element, a priori = $p_s - 200$ hPa
Aerosol single-scattering albedo ω		fixed at 0.95
Aerosol phase function $P(\theta)$		Henyey–Greenstein with asymmetry factor g of 0.7
Cloud mask		none
Validation	CALIOP lidar profiles	5 km × 5 km total attenuated backscatter at 1064 nm