

Table 1. Overview of the NO₂ retrieval settings by MAX-DOAS included in this intercomparison study. These settings were applied for the NO₂ DOAS analysis on 01 November, 2017. The table lists the studies included, Wavelength ranges for each study, and absorber fitted used in a specific study. It also includes various parameters retrieved e.g., Maximum dSCD (molecules cm⁻²), Average dSCD (molecules cm⁻²), RMS, spectrum shift and dSCD error (molecules cm⁻²)

Study	Wavelength (nm)	Absorber fitted (Cross-Sections)	Maximum dSCD (Molec.cm ⁻²)	Average dSCD (Molec.cm ⁻²)	RMS	Spectral shift	dSCD Error (Molec.cm ⁻²)
(Tian et al., 2018)	338–360	NO ₂ (298 K) , NO ₂	1.96E+17	7.16E+16	5.82E-04	-5.26E-03	4.13E+15
		(220 K), O ₃ (223			-	-	
		K), O ₄ (293 K),			4.64E-03	1.31E-03	
		BrO (223 k), SO ₂					
		(294 K), HCHO (293 K), Ring					
(Jin et al., 2016)	405–430	NO ₂ (294 K), O ₄	2.09E+17	7.27E+16	4.30E-04	-3.68E-04	8.75E+14
		(296 K), Ring			-	-	
					4.42E-03	8.91E-03	
(Chong et al.,	400–418	NO ₂ (294 K), O ₃	2.09E+17	7.28E+16	3.73E-04	-1.15E-03	2.12E+15
		(221 K), O ₄ (298			-	-	
		K), Ring			5.57E-03	5.19E-03	
(Friedeburg et	430 and 441	NO ₂ , Ring	2.14E+17	7.34E+16	4.53E-04	-2.91E-04	9.63E+14
					-	-	
					3.26E-03	3.62E-03	
(Chan et	350.2–386.6	NO ₂ , O ₄ , O ₃ ,	1.86E+17	6.06E+16	5.81E-04	-2.10E-03	2.49E+15
		HCHO, Ring			-	-	

					4.29E-03	1.32E-03	
(Lee et al., 2009)	364–383	NO ₂ , O ₄ , O ₃ (243 and 293 K), Ring	1.93E+17	6.03E+16	5.10E-04 - 3.85E-03	-2.05E-03 - 1.65E-03	2.67E+15
(Khokhar et al.,	405-455	NO ₂ (294K), O ₄ , O ₃ (243K) H ₂ O (290K), Ring	2.19E+17	7.43E+16	4.41E-04 - 5.72E-03	-1.69E-04 - 4.74E-03	5.88E+14
(Shaiganfar et al., 2015)	435-456	NO ₂ (298K), O ₄ (296K), O ₃ (243K) H ₂ O (298K), CHOCHO (296K) Ring	2.23E+17	7.47E+16	4.36E-04 - 6.96E-03	-1.80E-04 - 2.49E-02	7.72E+14
(Shabbir et al.,	405-455	NO ₂ (294K), O ₄ (296K), O ₃ (241K) H ₂ O (290K), Ring	2.12E+17	7.51E+16	5.17E-04 - 5.72E-03	-1.80E-04 - 2.49E-02	5.82E+14
(Drosoglou et al.,	400-450	NO ₂ (223K), O ₃ (243K & 223K), Ring	1.91E+17	6.45E+16	4.36E-04 - 6.96E-03	-1.46E-04 - 2.48E-02	6.93E+14
(Wang et al., 2017)	351-390	NO ₂ (294K & 220K), O ₄ (293K), O ₃ (223K) HCHO (293K), Ring	1.52E+17	5.06E+16	4.36E-04 - 6.96E-03	-2.08E-03 - 1.25E-03	2.15E+15

(Leser et al.,	320-400	NO ₂ , O ₃ (223K & 246K), O ₄ , Ring	1.48E+17	4.59E+16	7.20E-04 - 6.45E-03	-2.42E-03 - 1.58E-03	2.26E+15
(Chan et al., 2020)	338-370	NO ₂ (298K & 220K), O ₄ (293K), O ₃ (223K & 243K), HCHO (298K), BrO (223K), Ring	1.58E+17	5.62E+16	5.94E-04 - 4.45E-03	-4.44E-03 - 1.08E-03	2.38E+15
(Drosoglou et al.,	411-445	NO ₂ (298K & 220K), O ₃ (223K), H ₂ O, Ring	1.72E+17	5.86E+16	4.49E-04 - 4.08E-03	-1.61E-04 - 5.68E-03	5.39E+14
(Ma et al., 2013)	400-420	NO ₂ (294K), O ₃ (221K), O ₄ (298K), H ₂ O, Ring	1.84E+17	6.38E+16	4.39E-04 - 4.73E-03	-8.09E-04 - 1.43E-02	1.82E+15
(Davis et al.,	410-435	NO ₂ (293K), O ₃ (293K & 243K), Ring	2.12E+17	7.38E+16	4.38E-04 - 4.45E-03	-1.61E-04 - 6.54E-03	1.13E+15
(Dimitropoulou et al., 2020)	338-370	NO ₂ (298K & 220K), O ₄ (293K), O ₃ (243K & 223K), HCHO (297K), BrO (223K), Ring	1.59E+17	5.65E+16	5.92E-04 - 4.46E-03	-4.43E-03 - 9.85E-04	2.40E+15
(Khokhar et al.,	405-445	NO ₂ (294K), O ₄ (296K), O ₃ (243K), H ₂ O (298K),	2.19E+17	7.42E+16	4.41E-04 - 5.72E-03	-2.56E-03 - 2.44E-02	5.80E+14

CHOCHO (296K)							
Ring							
(Kreher et al., 2019)	411-445	NO ₂ (294 K), NO ₂ (220 K), O ₃ (223 K), O ₄ (293 K), H ₂ O, Ring	1.50E+17	4.87E+16	5.98E-04	-2.73E-03	2.01E+15
					-	-	
					4.27E-03	4.70E-03	
This Study	409-445	NO ₂ (298 K), NO ₂ (220 K), O ₃ (223 K), O ₄ (293 K), H ₂ O, Ring	2.17E+17	6.61E+16	4.53E-04	-1.75E-04	6.96E+14
					-	-	
					8.05E-03	5.79E-03	