

Perturbation	HTOP	PDUR	AEC	AOT	Reference
Volcanic events					
Major eruption (Mt. Pinatubo, Philippines, June 1991)	25–35 km	Years	$25 \text{ Mm}^{-1}$	0.2–0.25	Ansmann et al. (1997); Jäger (2005); Trickl et al. (2013); Sakai et al. (2016); Zuev et al. (2017)
Moderate eruption (midlatitudes, tropics)	15–25 km	Months	$5\text{--}15 \text{ Mm}^{-1}$	0.02–0.025	Mattis et al. (2010); Uchino et al. (2012); Trickl et al. (2013); Sakai et al. (2016); Khaykin et al. (2017); Zuev et al. (2017)
Quiet periods			$0.2\text{--}0.6 \text{ Mm}^{-1}$	0.004	Jäger (2005); Khaykin et al. (2017)
Smoke events					
Extreme case (Canadian fires, August 2017; Australian fires, February 2009)	15–25 km	Months	$500 \text{ Mm}^{-1}$	0.5–1.0	This study; Khaykin et al. (2018); Siddaway and Petelina (2011); de Laat et al. (2012)
Typical case	15–20 km	Days/weeks	$20\text{--}30 \text{ Mm}^{-1}$	0.02	Fromm et al. (2010)
Background conditions			$1.5 \text{ Mm}^{-1}$	0.005	Renard et al. (2005, 2008)