



HONO Retrievals over Asia from the Geostationary Environment Monitoring Spectrometer (GEMS)

Hyeji Cha¹, Jhoon Kim¹, Heesung Chong², Gonzalo González Abad², Dha Hyun Ahn¹, Sangseo Park³, and Won-jin Lee⁴

¹Yonsei University, Atmospheric Sciences, Seoul, Korea, Republic of (chahyeji@yonsei.ac.kr)

²Center for Astrophysics | Harvard & Smithsonian, United States

³Ulsan National Institute of Science and Technology, Korea, Republic of

⁴National Institute of Environmental Research, Korea, Republic of

The hydroxyl radical (OH) plays a significant role in the atmosphere, driving the oxidation and removal of most trace gases. Therefore, quantifying the sources of OH is of great importance to the scientific community. Researchers have been particularly interested in the role of nitrous acid (HONO) in tropospheric photochemistry, as HONO serves as a source of OH. While ground-based measurements have been conducted in certain regions, there is a need for more extensive observations of HONO to enhance our understanding of its chemistry. In this study, the HONO retrieval algorithm from the Geostationary Environment Monitoring Spectrometer (GEMS) are presented, utilizing the ultraviolet spectra. The retrieval process consists of three steps: spectral fitting, air mass factor calculation, and post-processing. The retrieval window of 343.0 – 371.0nm is employed to obtain HONO slant columns and air mass factor calculation is performed using a monochromatic wavelength of 357 nm. Reference sector correction is then applied to compensate for the HONO slant columns from radiance reference spectrum. Focusing on biomass burning events, the increase in HONO from fire plumes was presented as the retrieved results. By refining the retrieval algorithm, more information on HONO chemistry as well as diurnal patterns is expected to be obtained.