



## Diurnal variations of anthropogenic sulfur dioxide over Asia observed from GEMS

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Sulfur dioxide emissions ( $\text{SO}_2$ ) from coal-fired power plants are known as a major contributor to air pollution.  $\text{SO}_2$  emitted into the atmosphere forms sulfate aerosols, leading to acid rain and causing damage to forests. Moreover, exposure to  $\text{SO}_2$  in humans can cause eye irritation and affect respiratory health. This study presents the column density variations of anthropogenic  $\text{SO}_2$  over Asia using the Geostationary Environment Monitoring Spectrometer (GEMS) onboard the Geostationary Korea Multi-Purpose Satellite-2B (GEO-KOMPSAT-2B). We investigated the diurnal variations of  $\text{SO}_2$  emissions from anthropogenic sources, such as coal-fired power plants in India. Retrieved  $\text{SO}_2$  columns from GEMS were compared with low-orbit satellites. In the GEMS observation area, there was a tendency of low sensitivity in  $\text{SO}_2$  retrieval due to scattering by air molecules in the high geometry region, particularly at a high viewing zenith angle (VZA), resulting in high uncertainty in  $\text{SO}_2$  retrieval. We discuss these tendencies in detail through an investigation of  $\text{SO}_2$  retrieval sensitivity based on concentration and geometry.