



Storm-time variations in the thermospheric density, composition and temperature

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We report storm-time thermospheric variations based on TIMED/GUVI FUV observations of the emissions from neutral species O, N, N₂ and NO. These emissions provide an opportunity to derive O/N₂ column density ratio, NO column density, N-149.3 nm emission or column density and temperature simultaneously. The GUVI results during geomagnetic storms show that (1) O/N₂ ratios can be depleted and enhanced depending on latitudes, (2) N, N₂ and NO are increased in the O/N₂ depleted regions, (3) temperature around 160 km is enhanced in the O/N₂ depleted and auroral regions, (4) strong large scale (> 1000 km) TADs are observed. These simultaneous observations of the thermospheric conditions provide a unique way to monitor the global neutral space weather and answer science questions (e.g. NO cooling and storm-time neutral recovery, TAD control of TID, gravity wave and tidal modulation of temperature), as well as data sources to validate related models.