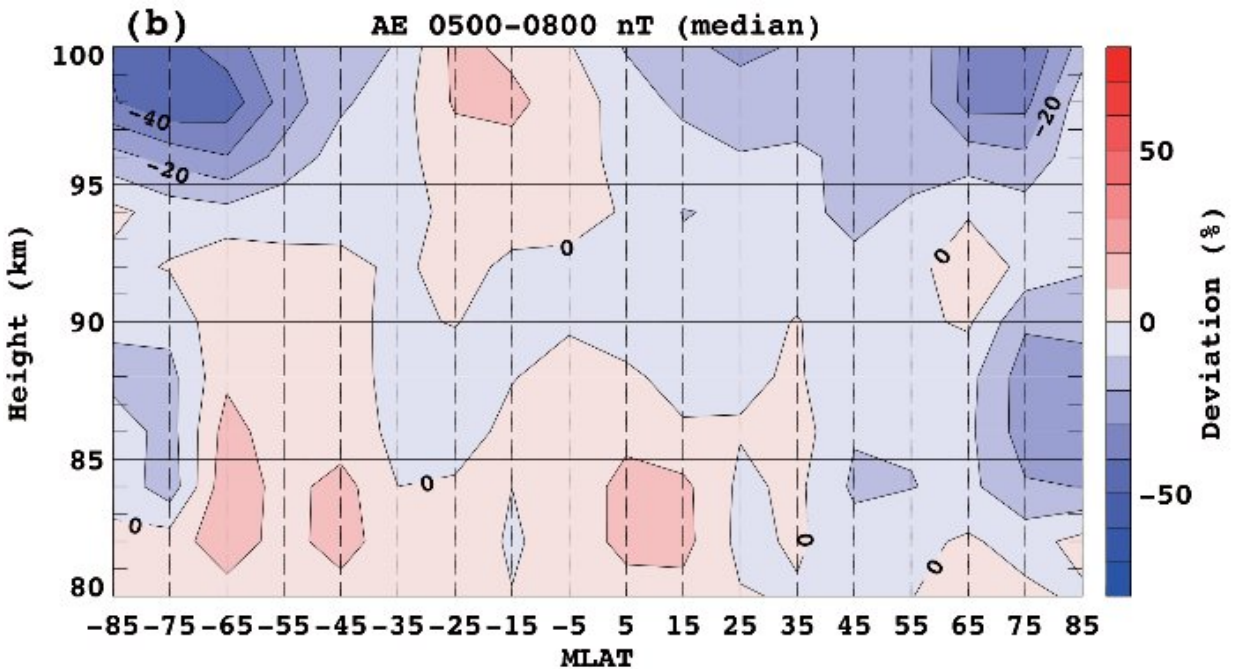


Global sodium variation revealed by satellite optical spectroscopic observations

April 9 2018



Global Na density responses due to the auroral activity. Credit: University of Electro Communications

Aurora light emission appears at high altitudes in the range 100-300 km in the polar atmosphere. Auroras are caused by energetic particles precipitating from space near the Earth. Auroral particle precipitation can induce many kinds of effects in the Earth's atmosphere.

Of interest are variations in the atmospheric composition induced by auroral [particles](#). However, auroral responses of metallic species such as sodium (Na), which is distributed at between 80-110 km, are not well understood, and notably, there is no statistical survey available about this topic because of limited data.

Now, Takuo Tsuda at the University of Electrocommunications, Tokyo (UEC, Tokyo), and colleagues have statistically investigated global Na responses to auroral activity using six years of optical spectroscopic observations from space.

The researchers derived Na [density](#) data from the Na D line emission spectra obtained by an Earth-orbiting satellite that provides global data coverage and compared the Na density data with auroral activity.

Their results showed that Na density can decrease through atmospheric chemical processes during high auroral activity.

The results indicate that the auroral particles can affect metallic species in the [atmosphere](#). The findings imply an important link between research on auroras and atmospheric chemistry.

More information: T. T. Tsuda et al. Statistical investigation of Na layer response to geomagnetic activity using resonance scattering measurements by Odin/OSIRIS, *Geophysical Research Letters* (2017). [DOI: 10.1002/2017GL072801](https://doi.org/10.1002/2017GL072801)

Provided by University of Electro Communications

Citation: Global sodium variation revealed by satellite optical spectroscopic observations (2018, April 9) retrieved 26 April 2024 from <https://phys.org/news/2018-04-global-sodium-variation->

[revealed-satellite.html](#)

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.