

## Characteristics of N<sub>2</sub><sup>+</sup> density distribution and its outflow in the polar ionosphere

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We calculated N<sub>2</sub><sup>+</sup> density distribution in the polar ionosphere. This provides us the understanding where N<sub>2</sub><sup>+</sup> up-flow occurs or how N<sub>2</sub><sup>+</sup> upflow is generated in the topside polar ionosphere.

Our numerical calculations suggest that N<sub>2</sub> and He<sup>+</sup> charge exchange reaction is important in the topside ionosphere at night. Large N<sub>2</sub><sup>+</sup> up-flow observed by Akebono satellite may be resulted in the reaction and may be accelerated along the magnetic field line.