## Eu-042

## Formation of field-aligned potential difference with finite current carriers

# Kazuo Shiokawa[1]

[1] STE Lab., Nagoya Univ.

http://stdb2.stelab.nagoya-u.ac.jp/member/shiokawa/

This paper describes a dynamic model for the formation of field-aligned potential difference Vpara along the auroral field line. The potential difference develops because the upward field-aligned current driven by magnetospheric processes is not fully carried along the field line to the ionosphere, because of a limit of the numbers of both downgoing electrons and upgoing ions in the mirroring magnetic field and considering gravitational force. The model explains the global characteristics of auroral electron acceleration, namely that Vpara is formed at the high-latitude side of the oval, Vpara is larger for lower magnetospheric electron density, and Vpara is smaller above the sunlit (summer) hemisphere.

This paper describes a dynamic model for the formation of field-aligned potential difference Vpara along the auroral field line. The potential difference develops because the upward field-aligned current driven by magnetospheric processes is not fully carried along the field line to the ionosphere, because of a limit of the numbers of both downgoing electrons and upgoing ions in the mirroring magnetic field and considering gravitational force. The model explains the global characteristics of auroral electron acceleration, namely that Vpara is formed at the high-latitude side of the oval, Vpara is larger for lower magnetospheric electron density, and Vpara is smaller above the sunlit (summer) hemisphere.