

PEM024-01

会場:ファンクションルームA

時間: 5月26日13:45-14:00

## 磁場の双極子化に伴って朝側に出現する数珠状のブラックオーロラ

### Periodic black auroras at the dawn-side dipolarization front during a substorm

坂口 歌織<sup>1\*</sup>, 塩川 和夫<sup>1</sup>, 中島 章光<sup>1</sup>, Eric Donovan<sup>2</sup>, Trond Trodsen<sup>2</sup>, Ferdinand Plaschke<sup>3</sup>

Kaori Sakaguchi<sup>1\*</sup>, Kazuo Shiokawa<sup>1</sup>, Akimitsu Nakajima<sup>1</sup>, Eric Donovan<sup>2</sup>, Trond Trodsen<sup>2</sup>, Ferdinand Plaschke<sup>3</sup>

<sup>1</sup>名古屋大学太陽地球環境研究所, <sup>2</sup>University of Calgary, <sup>3</sup>Technische Universitat

<sup>1</sup>Solar-Terrestrial Environment Laboratory, <sup>2</sup>University of Calgary, <sup>3</sup>Technische Universitat

We present characteristic black auroras observed in the dawnside auroral zone during a substorm on February 22, 2009. The auroras consisted of several black beads with a wavelength of about 4-5 km (about 1 degree) in longitude, which appeared along the equatorward edge of a quiet arc. These periodic structures were observed over three hours of MLT, from Gillam to Sanikiluaq, in Canada; They started approximately 15 minutes after an auroral intensification (substorm onset) occurred at Fort Yukon in Canada. Auroral observations by a meridian scanning photometer at Gillam revealed that the black-beads formed at the equatorward boundary of the proton aurora (H $\beta$ ), which moved poleward as this event unfolded. The black shapes were seen in 558-nm and 471-nm emission lines but not clearly seen in the 630-nm and H $\delta$  emissions. These observations indicate that the bead structures are formed by energetic electrons (higher than 1 keV) precipitating from inside of the transition region between dipolar and tail-like field lines after the substorm onset. Indeed, during this event THEMIS A, D and E, located in the plasmashet, roughly magnetically conjugate to the region where the auroral activity was taking place, observed dipolarizations of magnetic fields propagating downward (from the west). After the dipolarization front passed eastward, the black-beads aurora appeared and the black areas gradually expanded north and south. We suggest that this auroral structure was caused by the interchange instability due to confinements of high pressures by flux tubes that have been freshly dipolarized during the preceding substorm.

キーワード:ブラックオーロラ,サブストーム,磁場の双極子化,プロトンオーロラ,交換型不安定

Keywords: black aurora, substorm, dipolarization, proton aurora, interchange instability