

Motion and origin of the noon poleward moving auroral arcs

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Near-noon auroral arcs were investigated together with the ionospheric plasma flows derived from the EISCAT VHF measurements over Svalbard. The auroral arc motion was monitored at 0800 - 1300 MLT by the all-sky camera during four days in December 1998. It has been found that the noon auroral arcs move poleward at the velocity of the order of 200 - 600 m/s, and this velocity does not show any dependence on the velocity of the ionospheric plasma convection along the same direction. The arc velocity shows a dependency on local time and varies from about 200 m/s at 1100 MLT to 600m/s at both 0900 and 1300 MLT. The auroral arcs appear at 5 - 15 min after strong changes (up to 4 km/s) in the meridional plasma flow, which resulted from variations in the interplanetary magnetic field. The observed features allow to suggest that the noon auroral arcs arise as a result of interference between Alfven field line eigenmode toroidal oscillations on different L-shells. The FLR oscillations at the near-cusp L-shells are excited by the Alfven impulse associated with the convection disturbance, which is due to variations in interplanetary parameters and (or) dayside reconnection. The FLR model for the generation of the poleward moving auroral forms is discussed.