

# FACs and Plasma-Sheet Structure

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Four examples of FAST data comparing field-aligned currents to different regions within the electron and ion plasma sheets.

Dusk-side – low latitude edge of downward FACs related to ion precipitation boundary. Not necessarily the inner edge of the ion plasmashet.

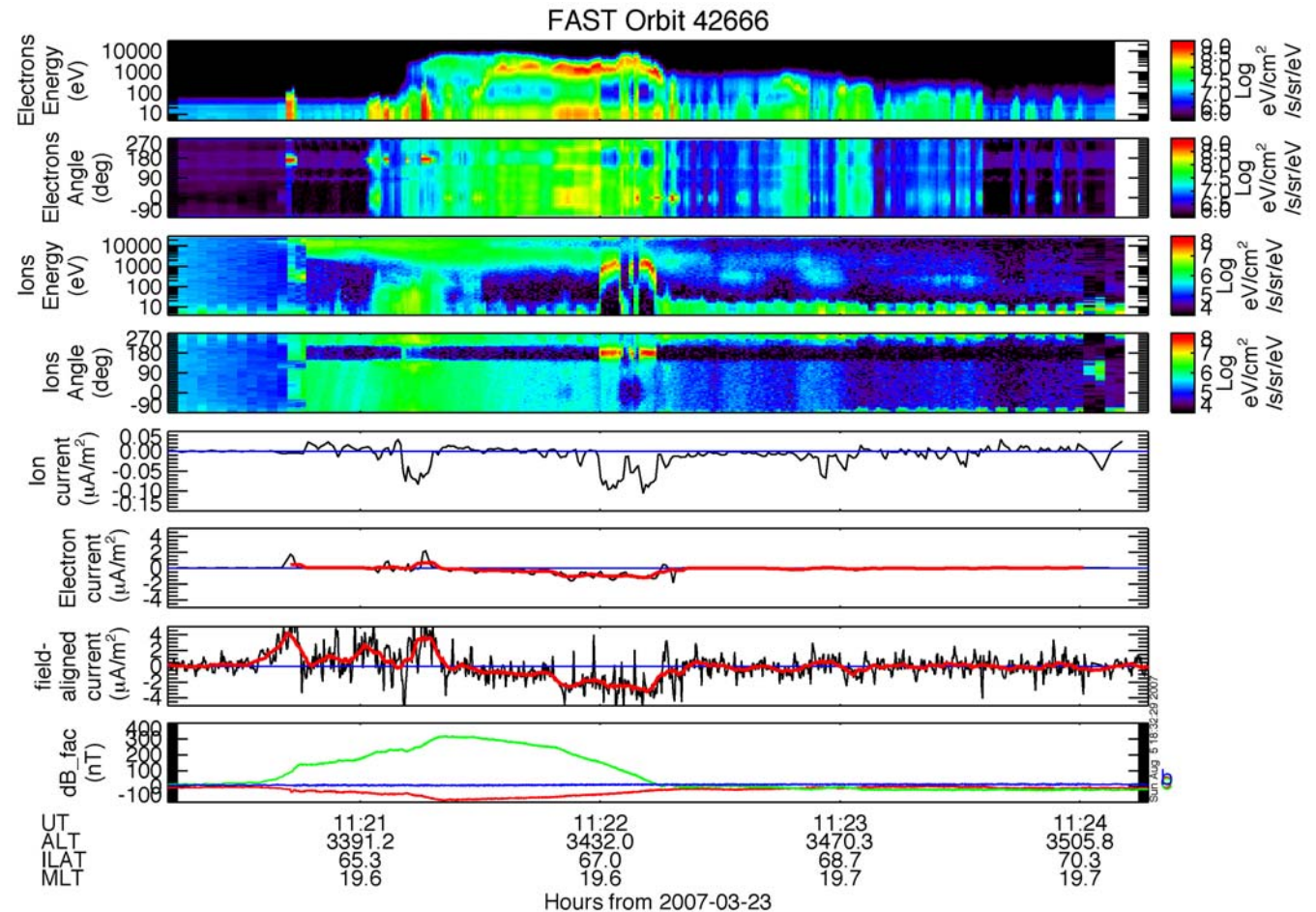
Dusk-side – upward FAC extends across the entire electron plasmashet.

Dawn-side – ion plasmashet may impose some structure, but upward current extends well below ion precipitation boundary

# Dusk-Side FACs – flow channel between ion and electron plasmasheet

Downward current at equator edge of ion plasmasheet precipitation boundary, extends up to electron plasmasheet (Region 2 polarity)

Entire upward current in electron plasmasheet (Region 1 polarity)

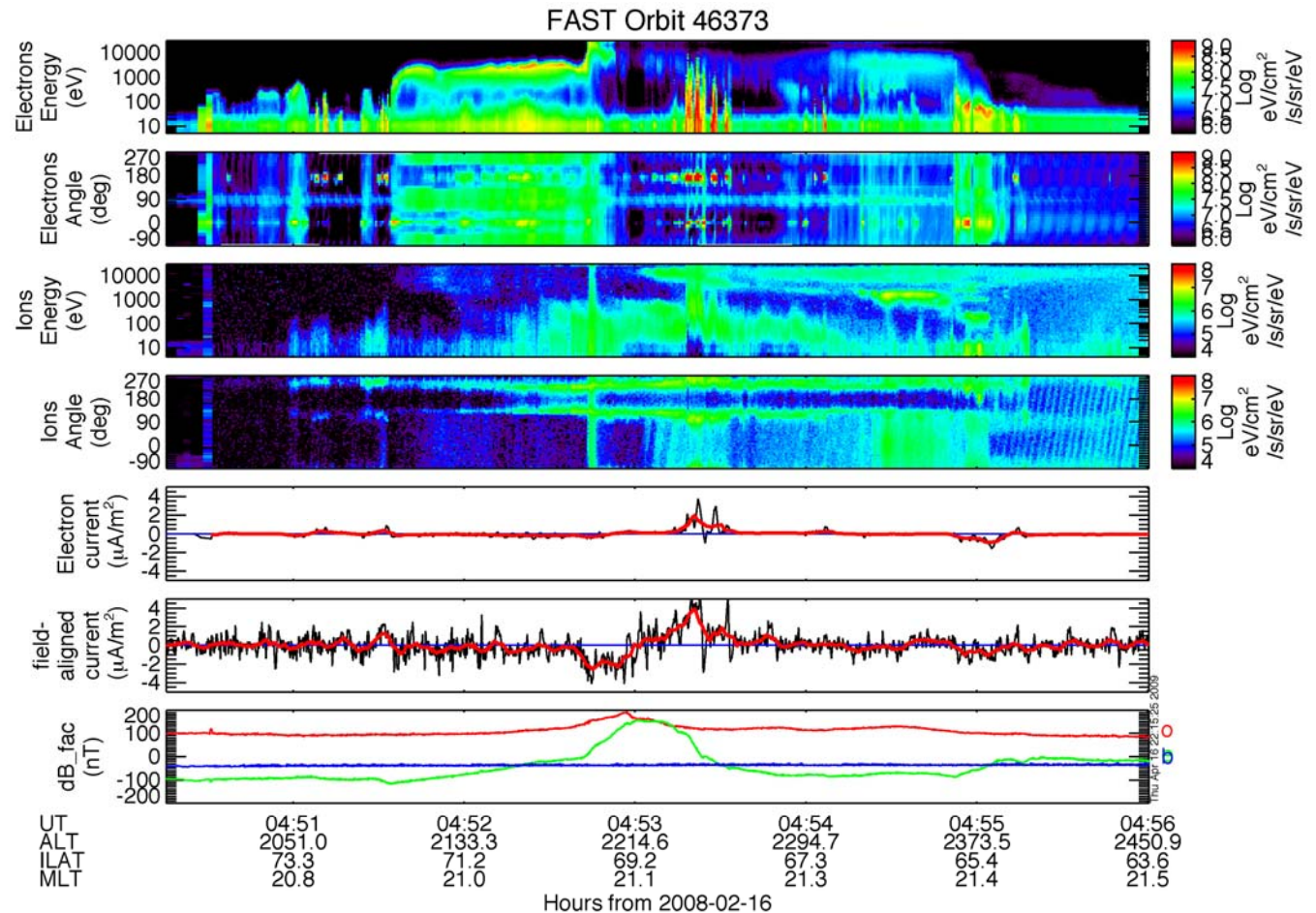


# Westward Flow Channel Between Eastward Flow Channels

Eastward flow at both high and low latitudes, even though in evening sector!

Downward current at high latitude side of ion plasmasheet

Ion precipitation boundary marks low latitude edge of low latitude eastward flow

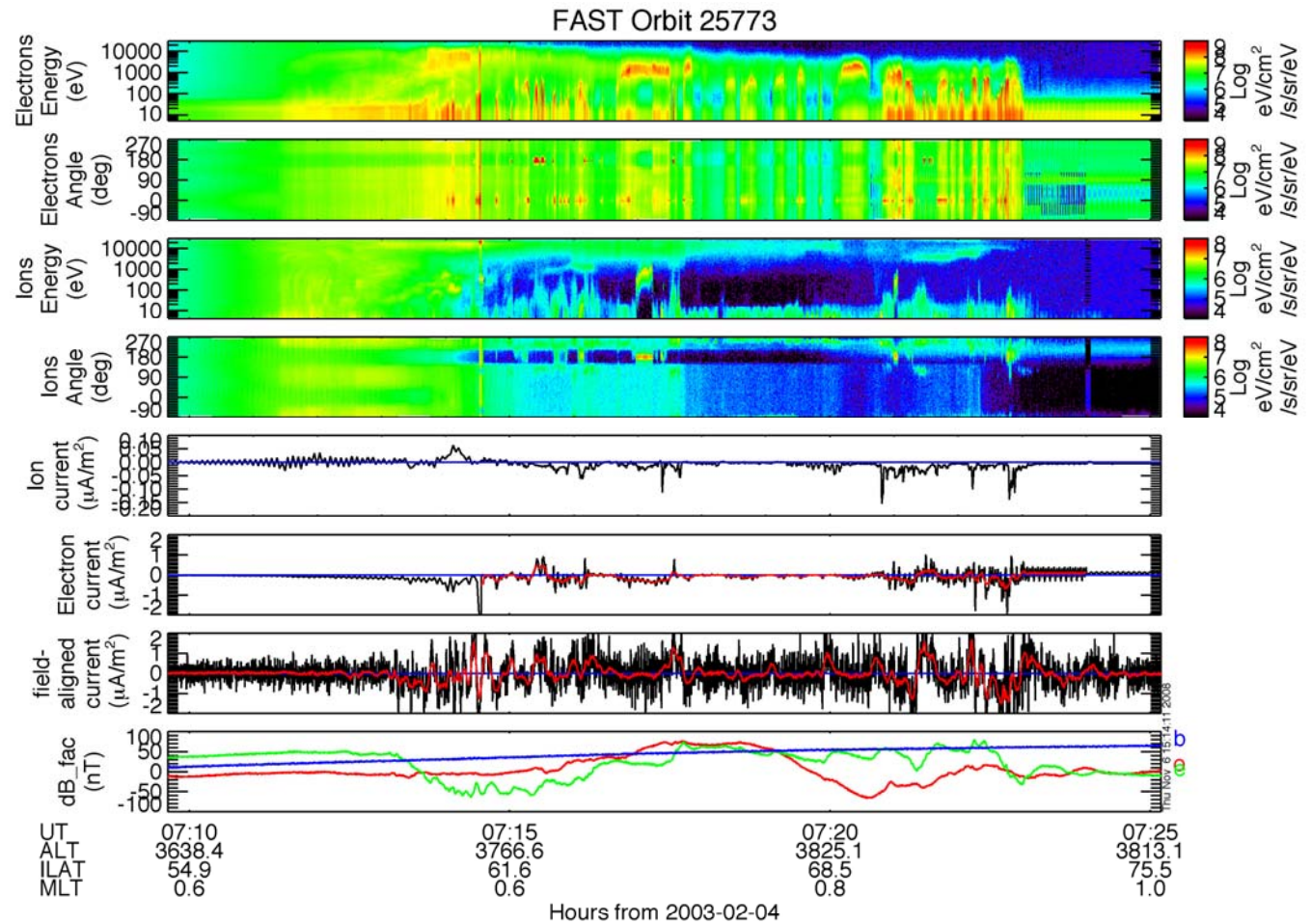


# Midnight FAC structure

Complicated FAC structure

FACs mainly confined to latitudes above ion precipitation boundary

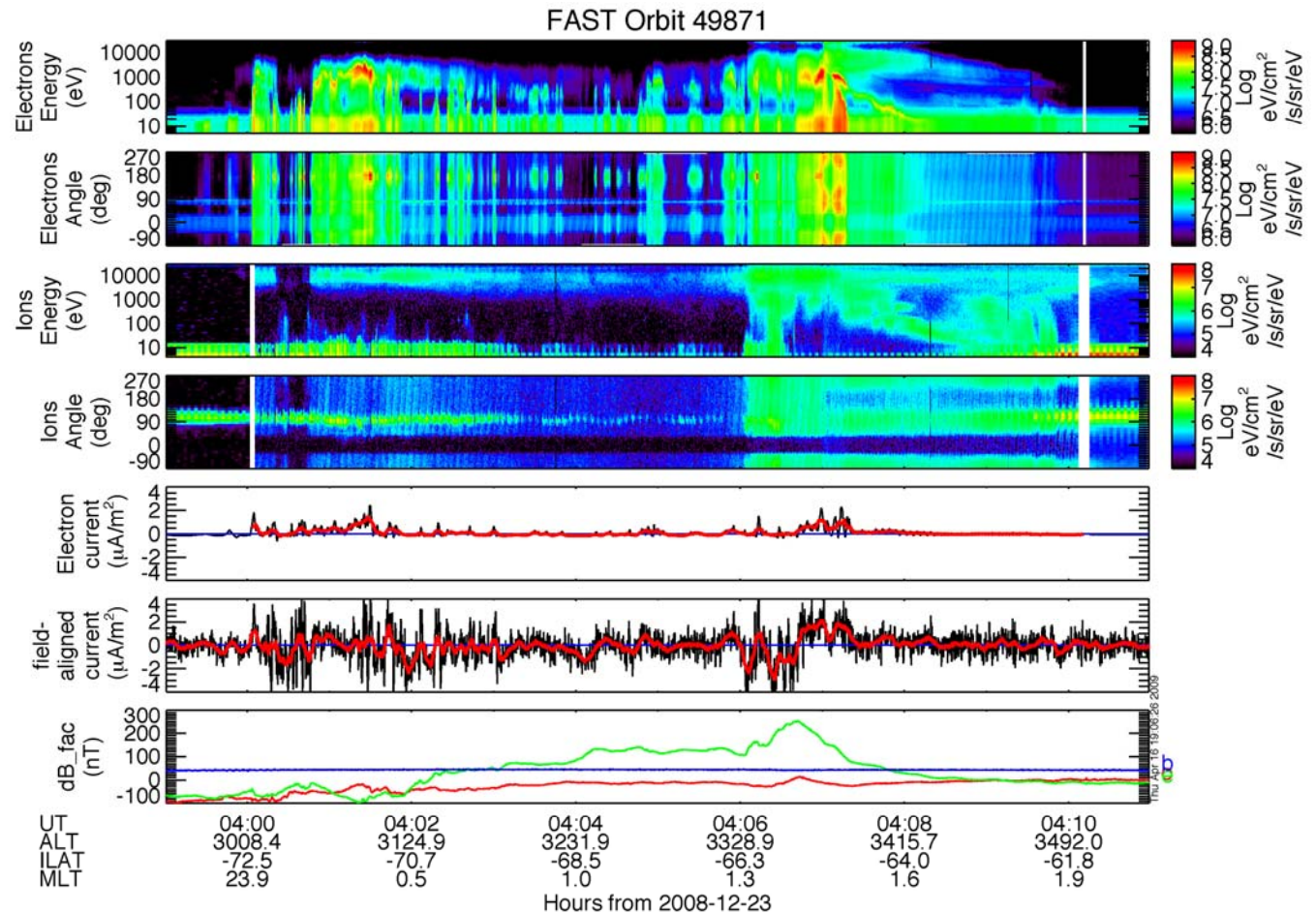
What role are precipitating ions playing restricting the regions of FACs?



# Post-Midnight FACs

Where is the polar cap boundary?

Again some interplay of ion and electron plasmashet, but now the electron plasmashet may be controlling the extent of the upward current (Region 2 polarity)



# Questions

- What is the mapping of the field-aligned currents?
- What role does precipitation play in controlling location of FACs?
- Single events indicate:
  - Dusk-side upward currents map to entire electron plasmasheet
  - Downward currents restricted to latitudes above ion precipitation boundary, but the ion plasmasheet can extend to lower latitudes
  - Dawn-side upwards currents can extent to much lower latitudes than ion precipitation boundary