

A new perspective of MI-coupling in auroral zone associated with Pi2 pulsations

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A new perspective of MI coupling in auroral zone proposed in our model includes:

- (1). During the substorm onset, the surface waves are excited in the nighttime sector by the K-H instability at the earthward interface of the flow diversion.
- (2). The surface waves were coupled to the Alfvén waves in the magnetosphere, where a strong wave coupling that leads to FLR was not assumed.
- (3). The weakly coupled Alfvén waves may not carry field-aligned currents (FAC) from the magnetosphere but generate the convergent electric field regions in the ionosphere by the combined modes of the field line oscillations.

The convergent electric fields produce loop currents in the ionosphere, as well as upward FAC at the center and downward FAC in the peripheral. The FAC system may be sustained directly by the enhanced parallel flows of plasma sheet electrons and their returns. The convergent electric field regions correspond to the westward traveling surge (WTS) in the active auroras.

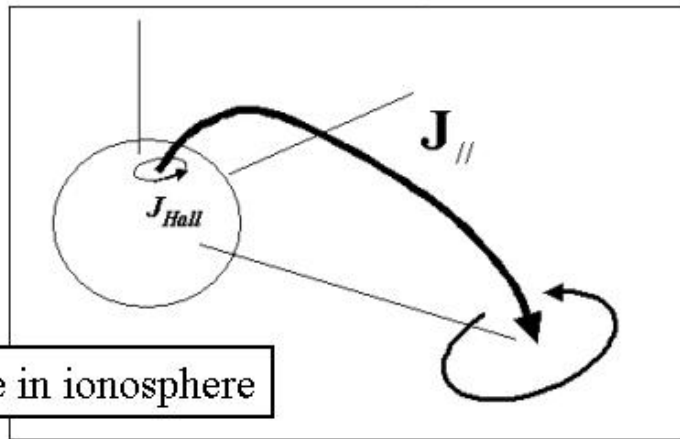
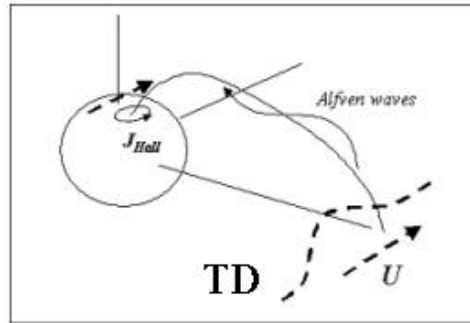
References:

- Saka et al., JASTP, 2007, 2010, 2012
Saka et al., JGR, 2012, 2015
Saka et al., AnnGeo, 2014

Keywords: substorm, MI coupling, Auroras

New perspective of MI coupling associated with Pi2

- Shear flow (U) supported by TD
- K-H instability
- Surface waves



- FAC source in ionosphere