Effects of auroral potential drops $\Delta\Phi_{||}$ on MI coupling

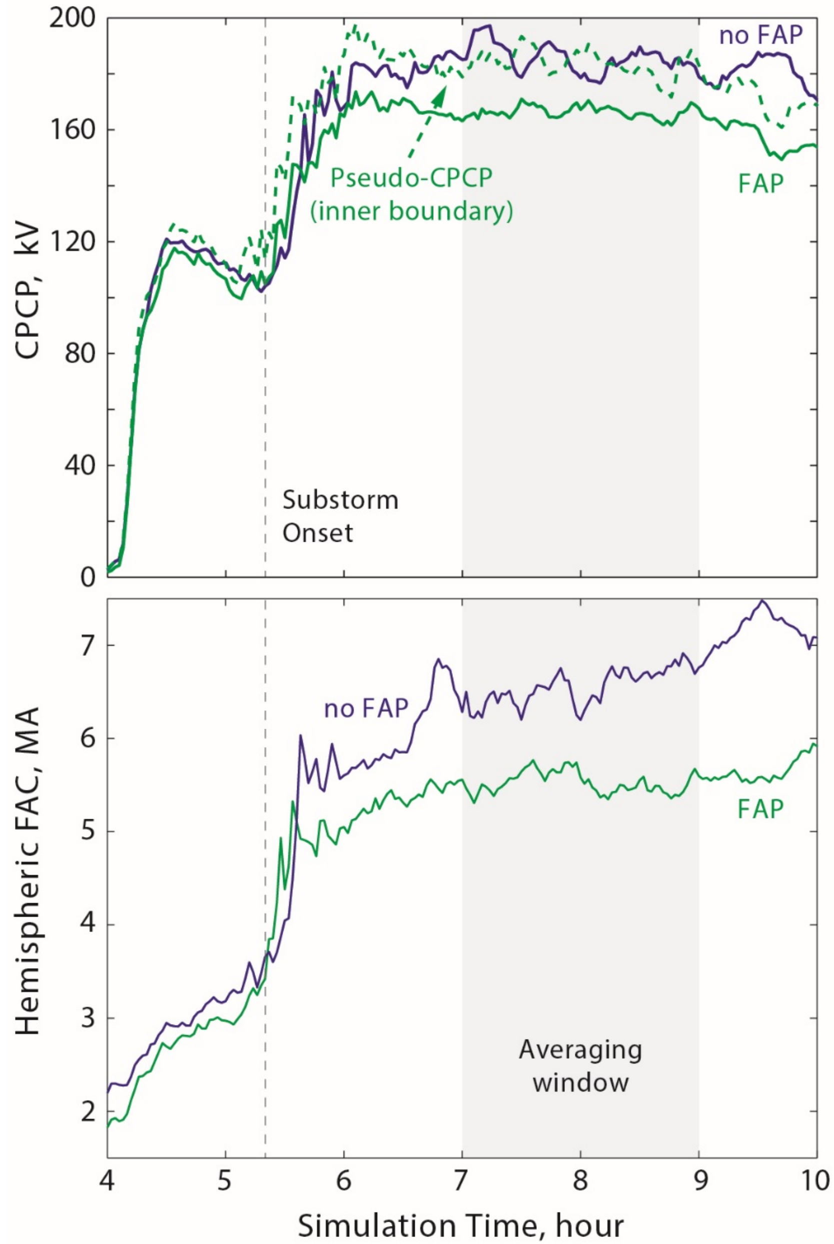
<u>**Ionospheric diagnostics**</u>

CPCP and FACs

Constant conductance
Experiment: Σ_P = 5S, Σ_H = 0

Dayside reconnection potential is the same with and w/o $\Delta\Phi_{||}$.

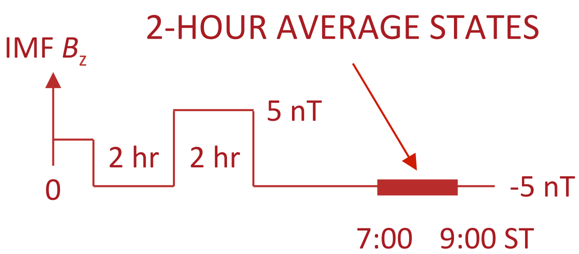
Hemispheric FAC is lower with $\Delta\Phi_{||}$ because the effective resistance in the global circuit is larger.



Effects of auroral potential drops $\Delta\Phi_{||}$ on MI coupling

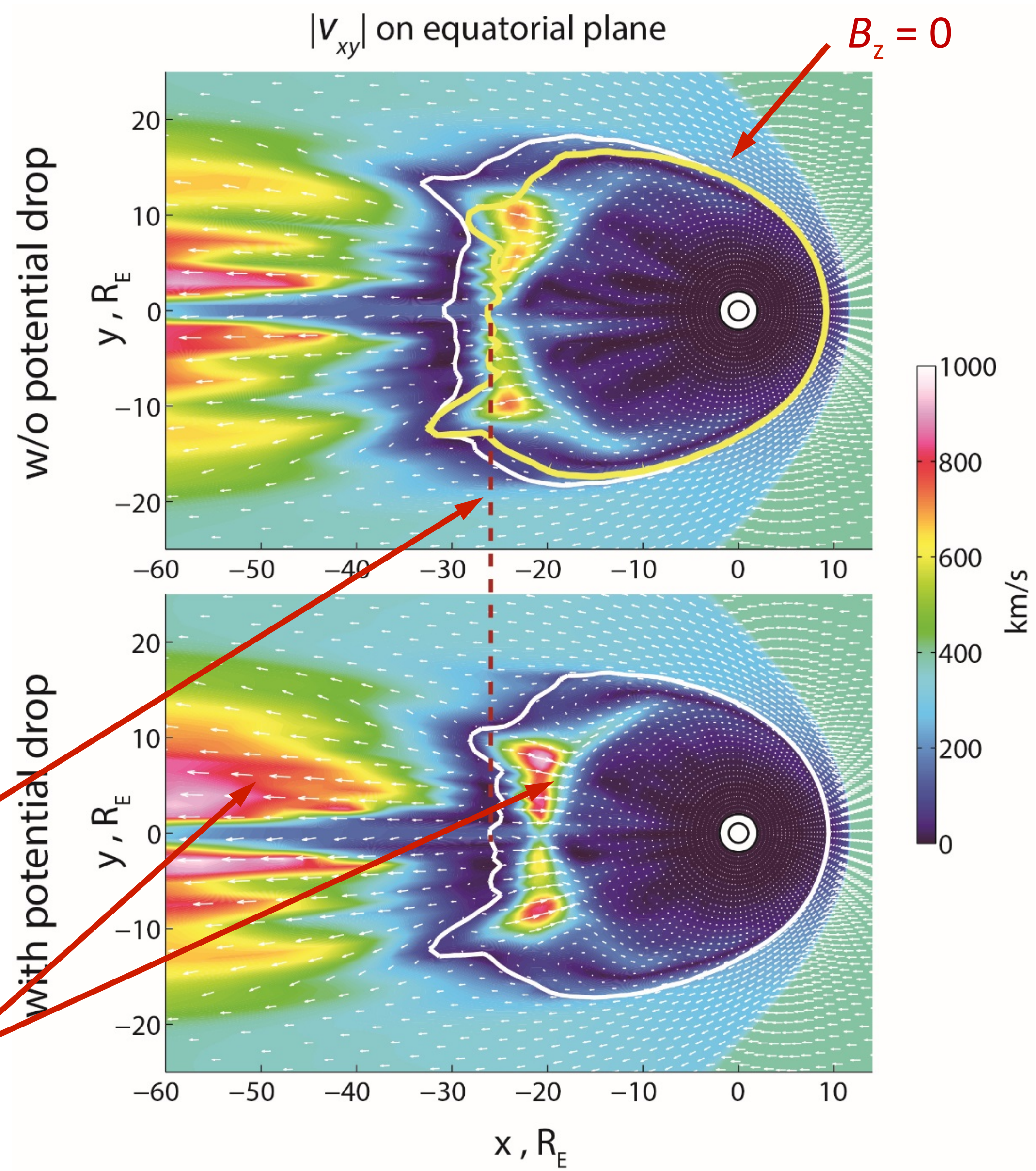
Magnetospheric diagnostics:
X-line and flows

Σ_P = 5S
Σ_H = 0

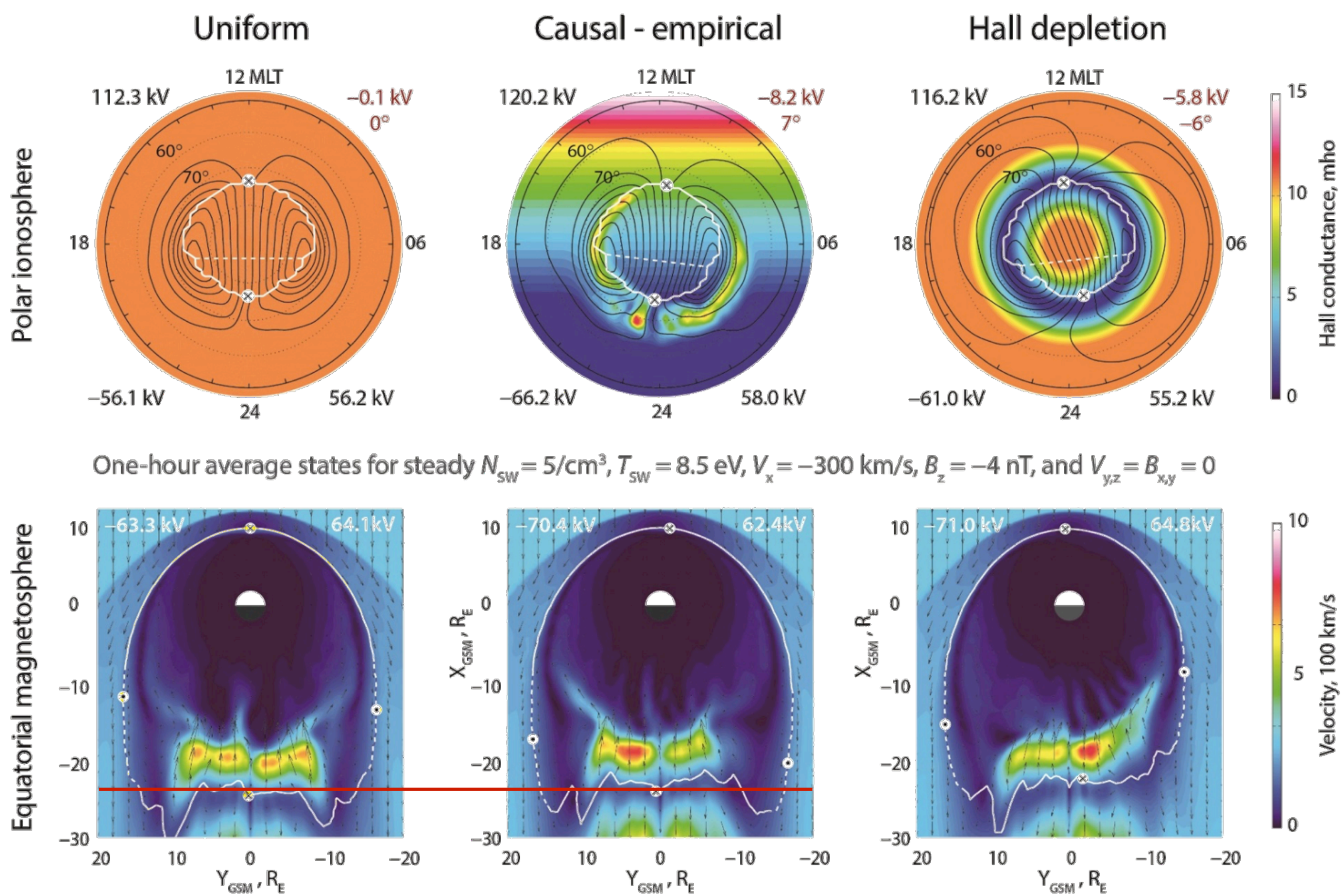


With potential drops

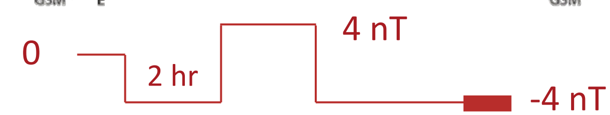
- Tail x-line moves earthward
- Reconnection exhaust flow velocities increase



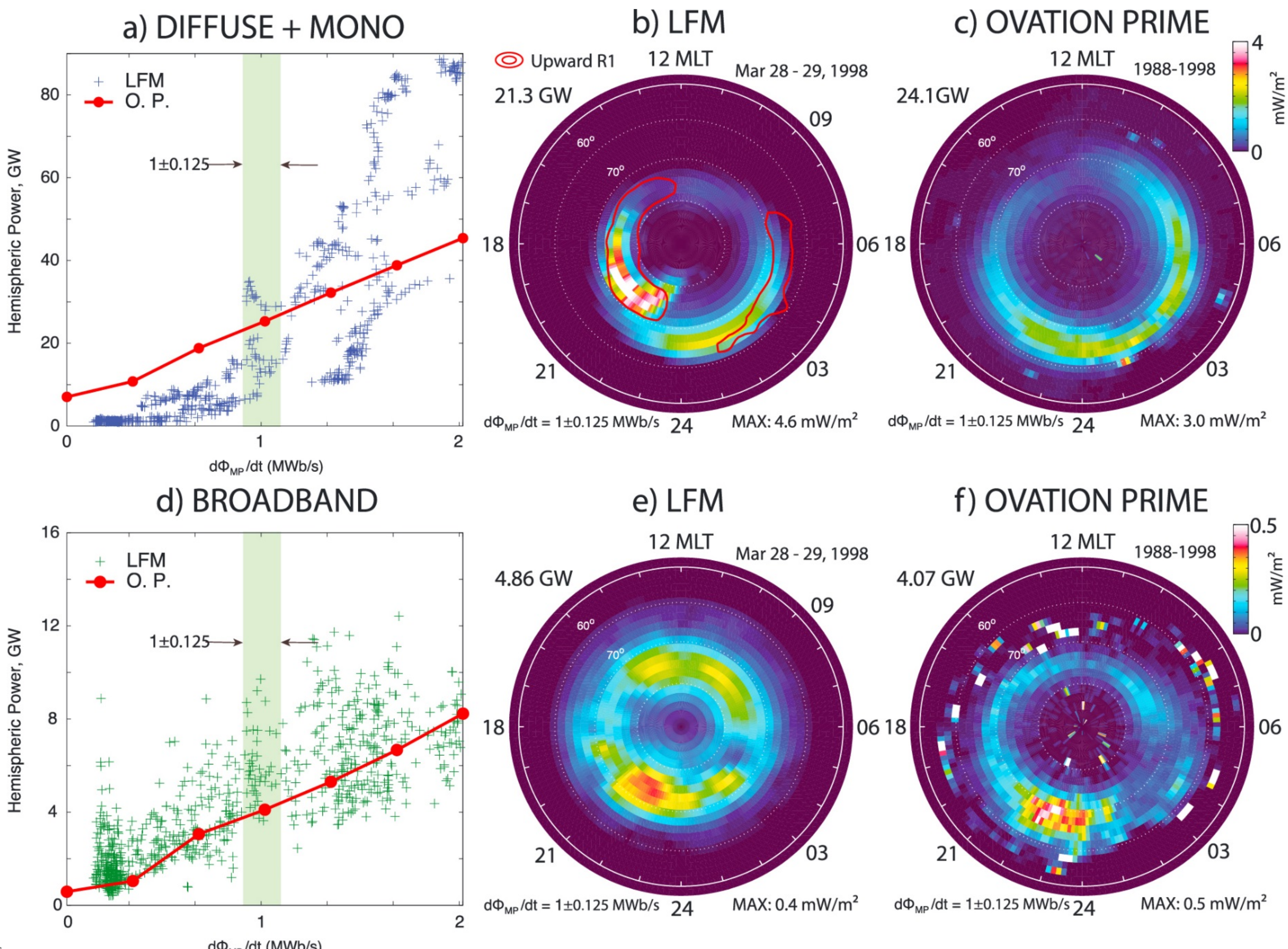
Effects of ionospheric conductance on MI coupling



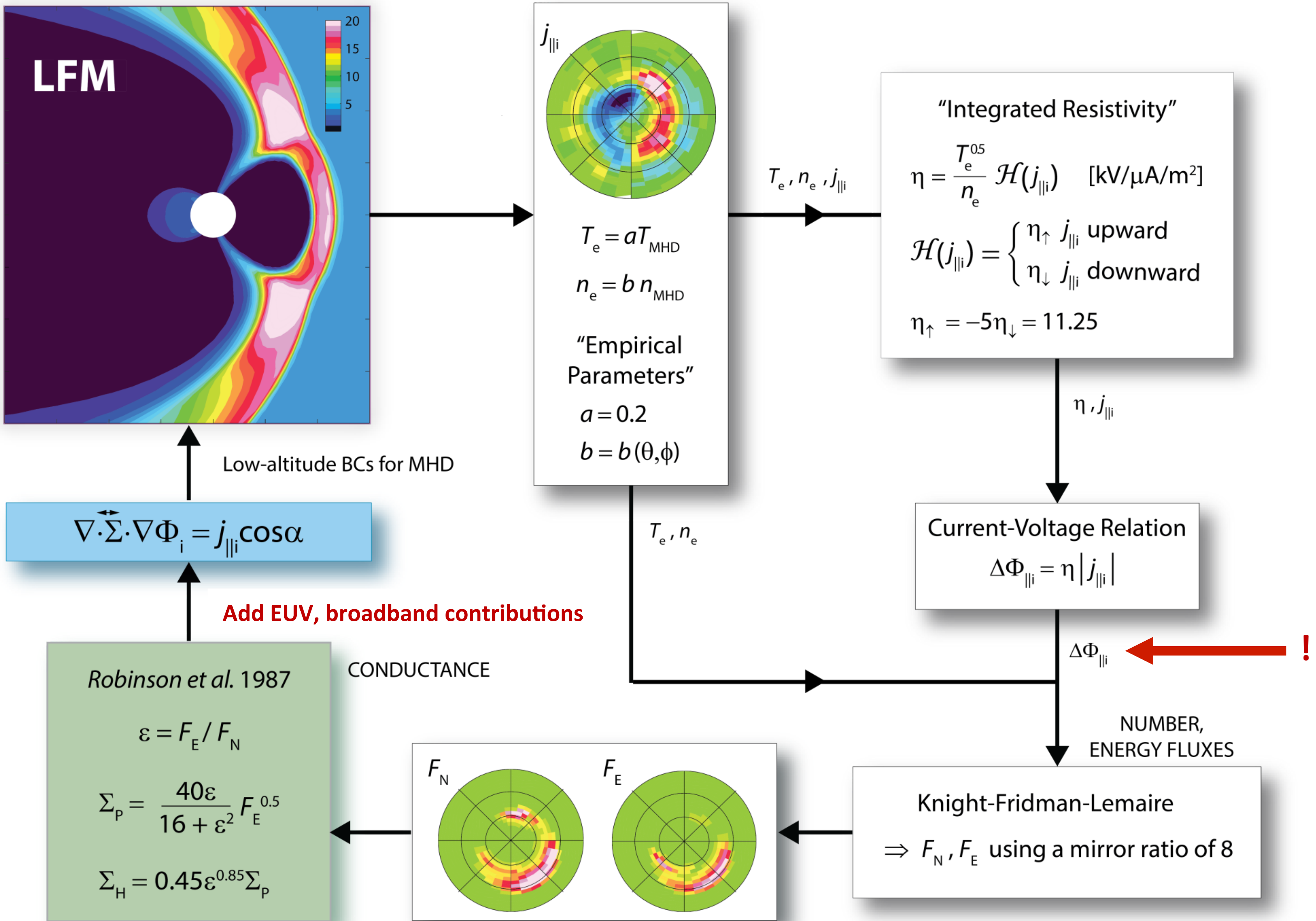
1-HOUR AVERAGE STATES



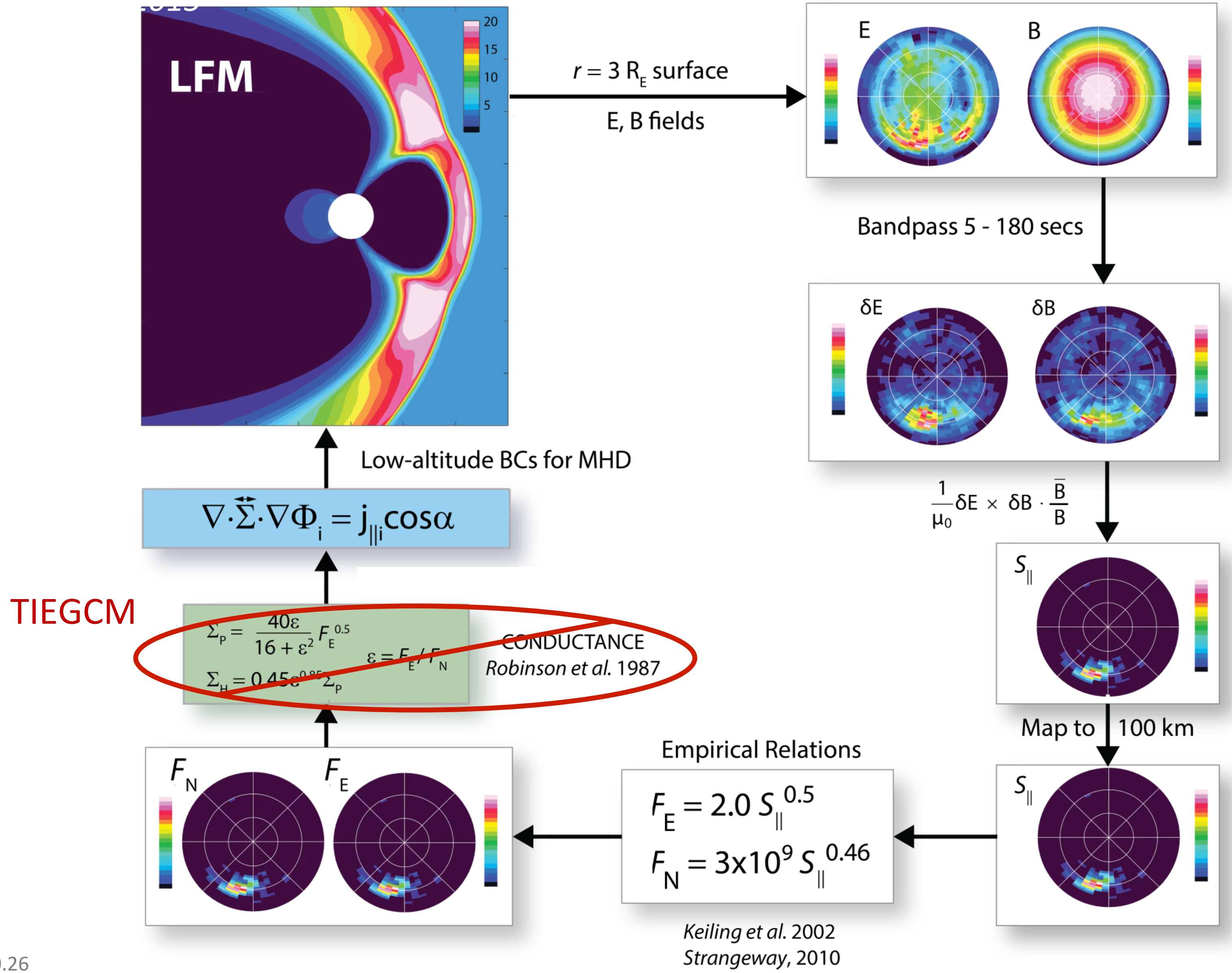
Electron precipitation models in global magnetosphere simulations



LFM's algorithm for diffuse and monoenergetic electron precipitation



Empirical model for broadband electron precipitation

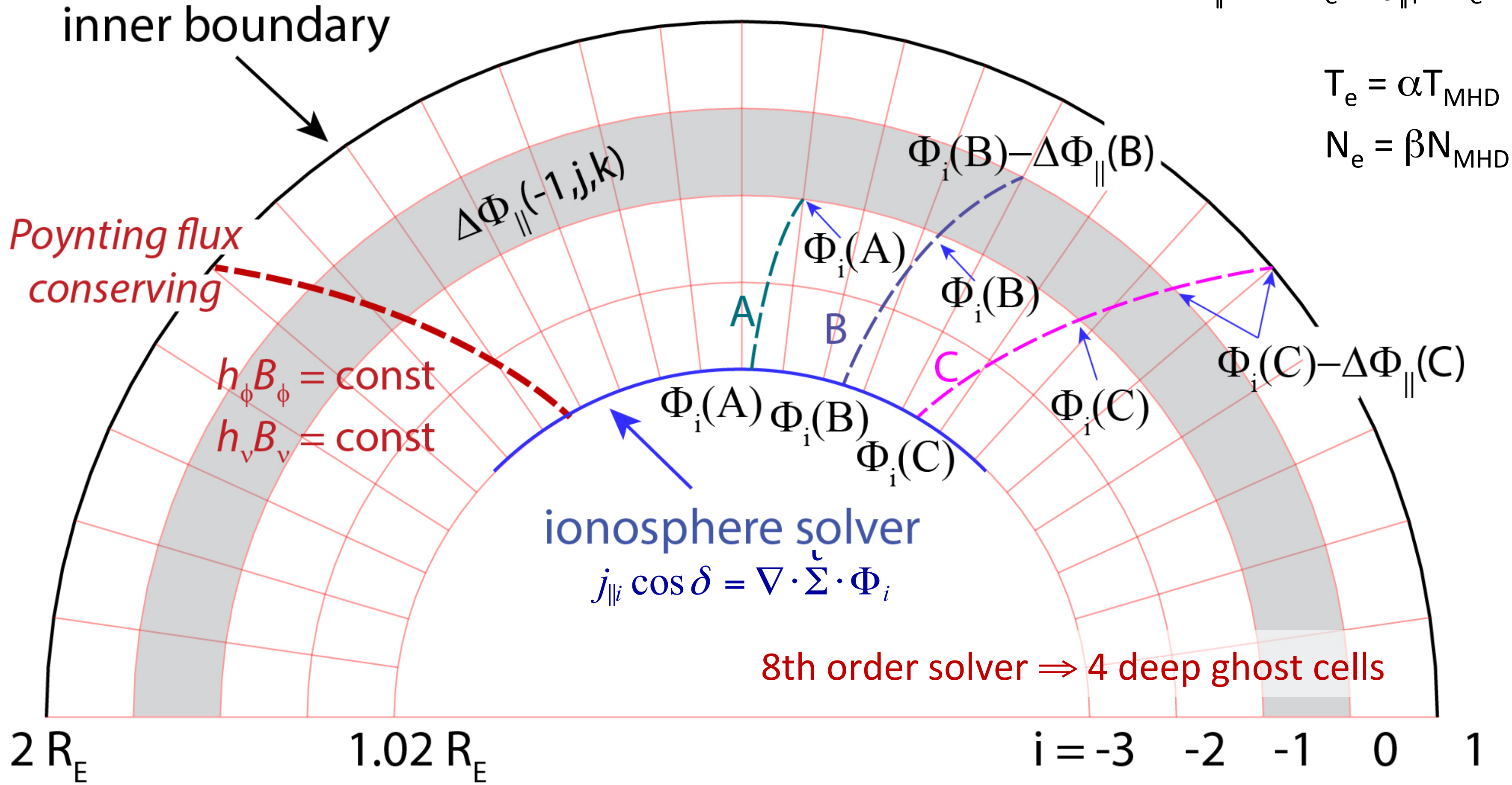


Including auroral potential drops $\Delta\Phi_{\|}$ in MI coupling

$e\Delta\Phi_{\|} = \pm R\, T_e^{1/2}\, j_{\|i} / N_e$

$T_e = \alpha T_{MHD}$

$N_e = \beta N_{MHD}$



SW/IMF: V_x = 400 km/s , N_{SW} = 5 cm^{-3} , C_s = 40 km/s , B_z = - 5 nT , $V_y = V_z = B_x = B_y = 0$