

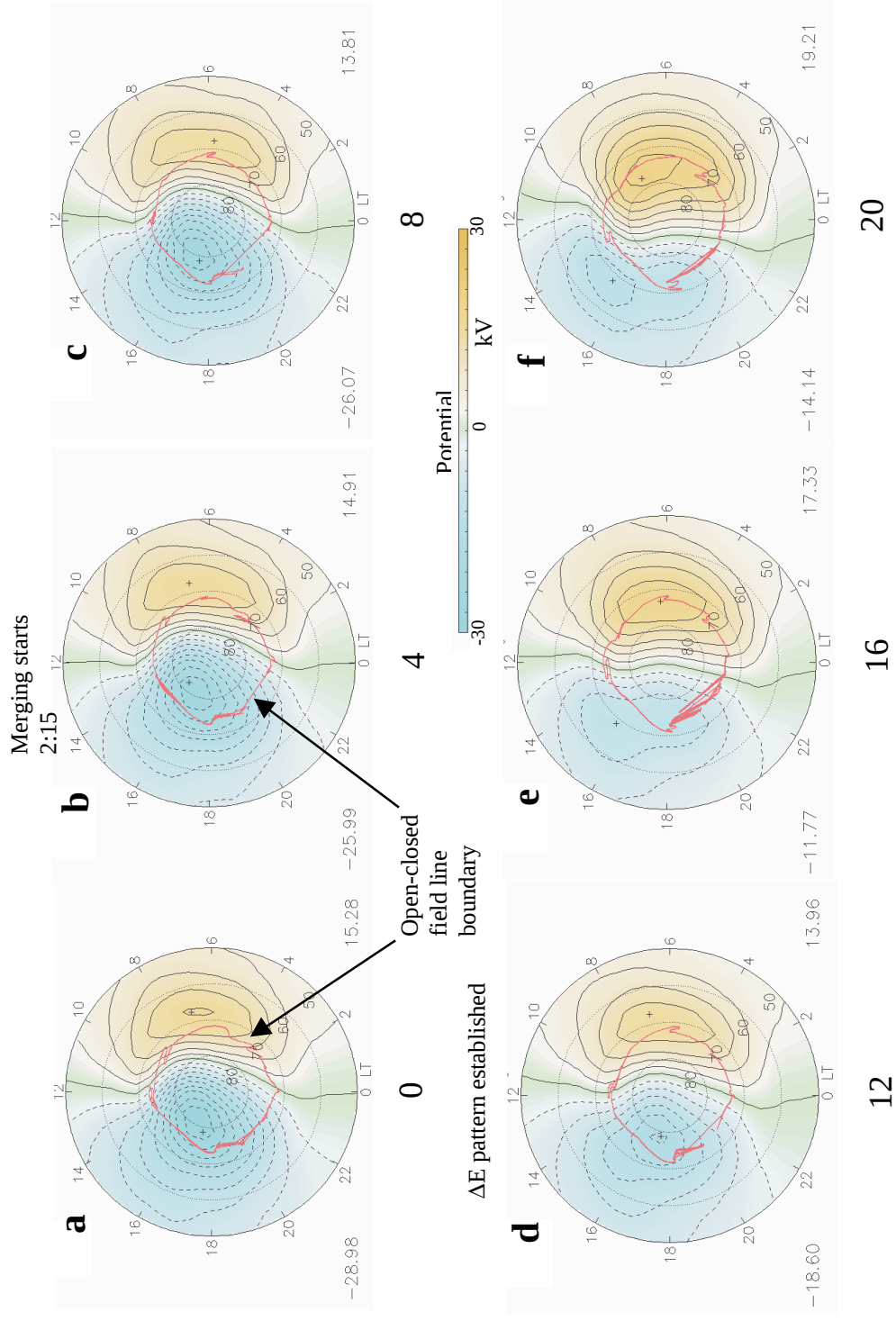
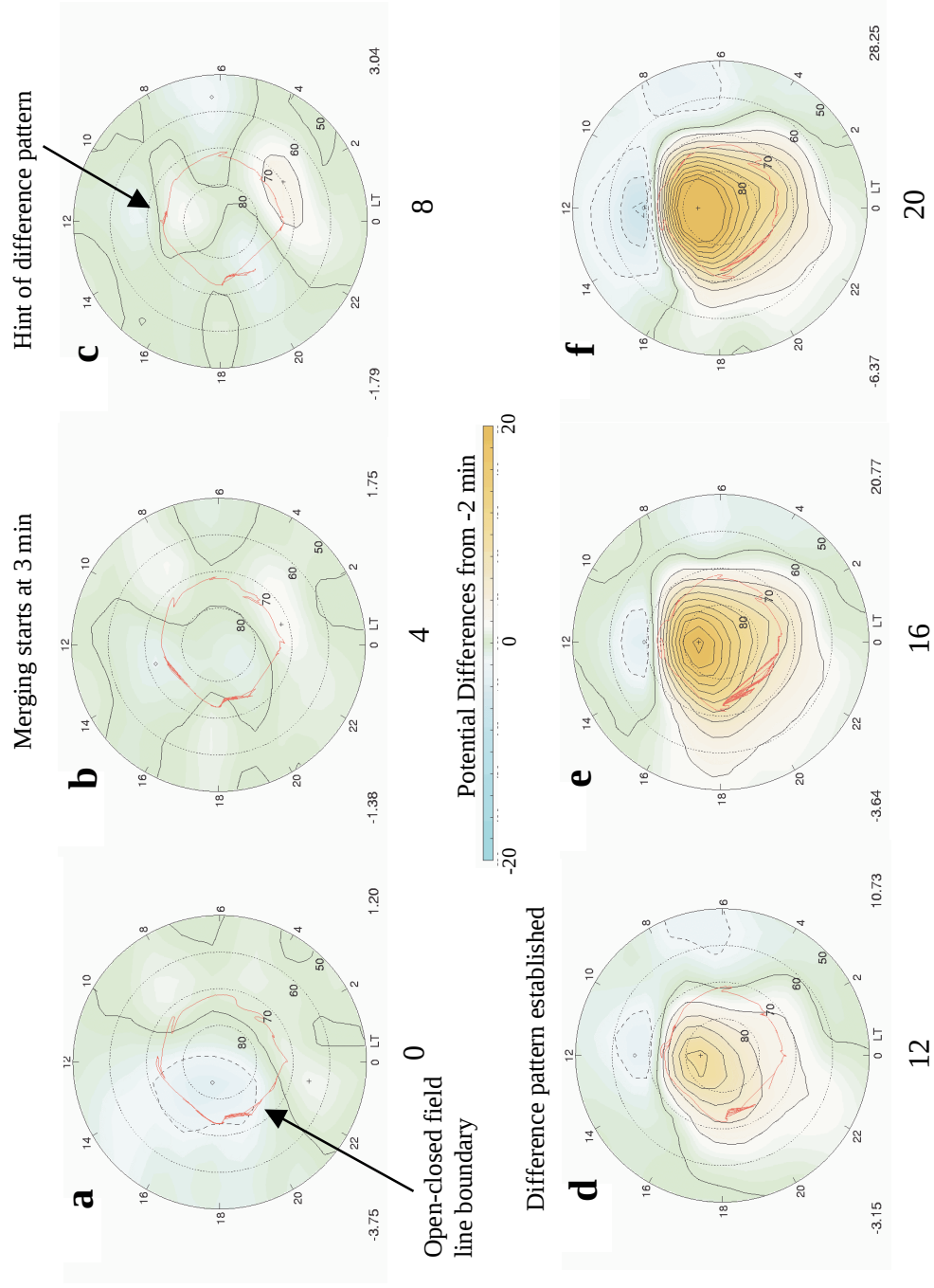


Plate 1



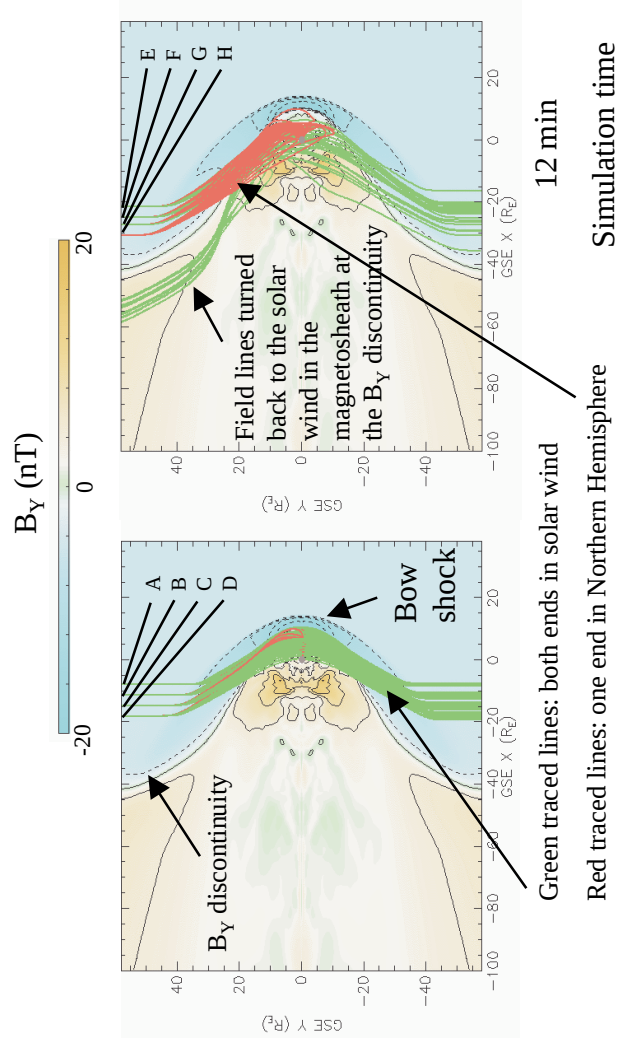
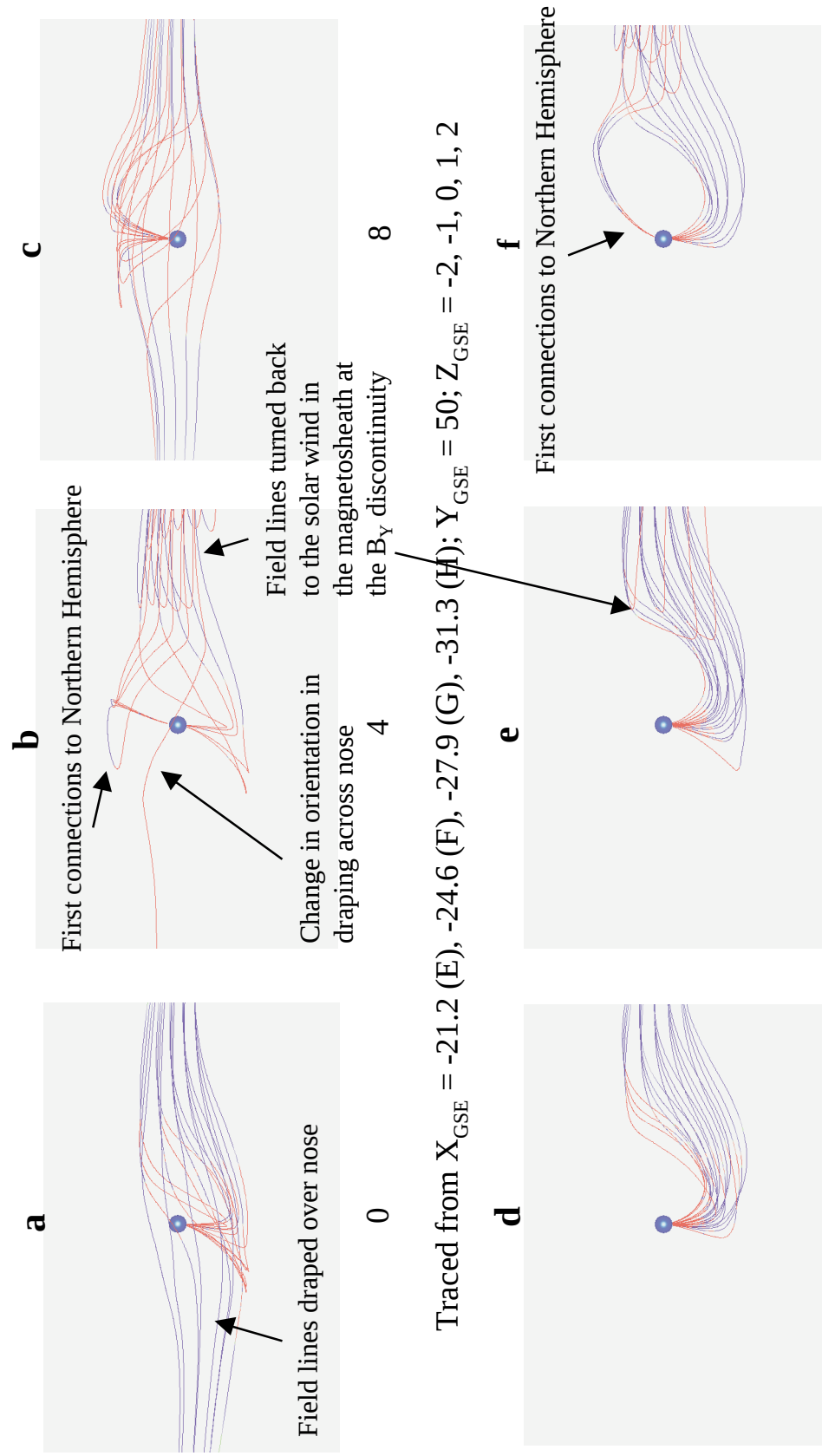


Plate 3

Field Line Traces Colored with J • E: Red positive, Blue negative

Traced from $X_{GSE} = -7.8$ (A), -11.1 (B), -14.5 (C), -17.9 (D); $Y_{GSE} = 50$; $Z_{GSE} = -2, -1, 0, 1, 2$

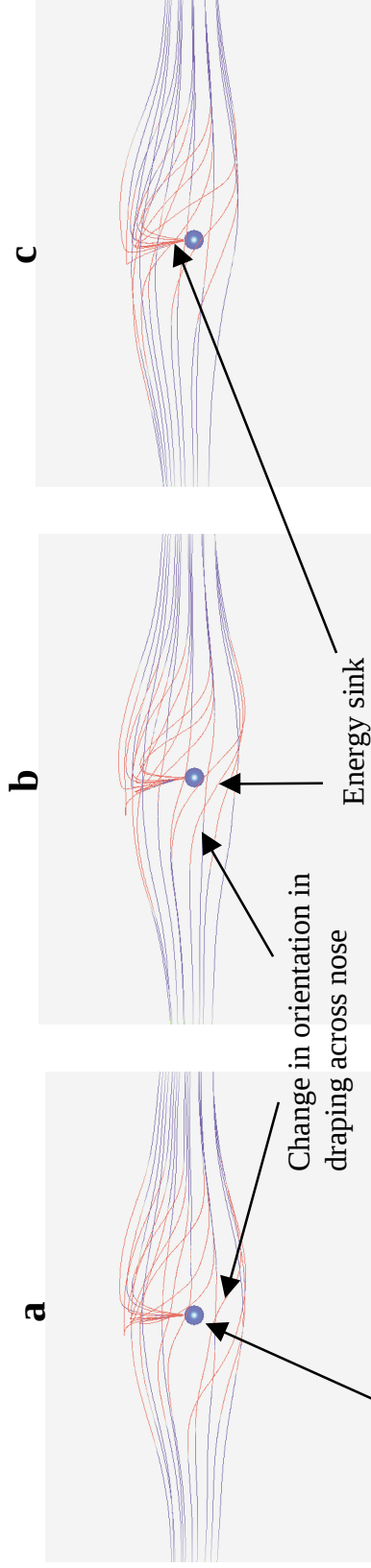


Traced from $X_{GSE} = -21.2$ (E), -24.6 (F), -27.9 (G), -31.3 (H); $Y_{GSE} = 50$; $Z_{GSE} = -2, -1, 0, 1, 2$

Time from first contact (min)

Field Line Traces Colored with $J \cdot E$: Red positive, Blue negative

Traced from $X_{GSE} = -7.8$ (A), -11.1 (B), -14.5 (C), -17.9 (D); $Y_{GSE} = 50$; $Z_{GSE} = -2, -1, 0, 1, 2$

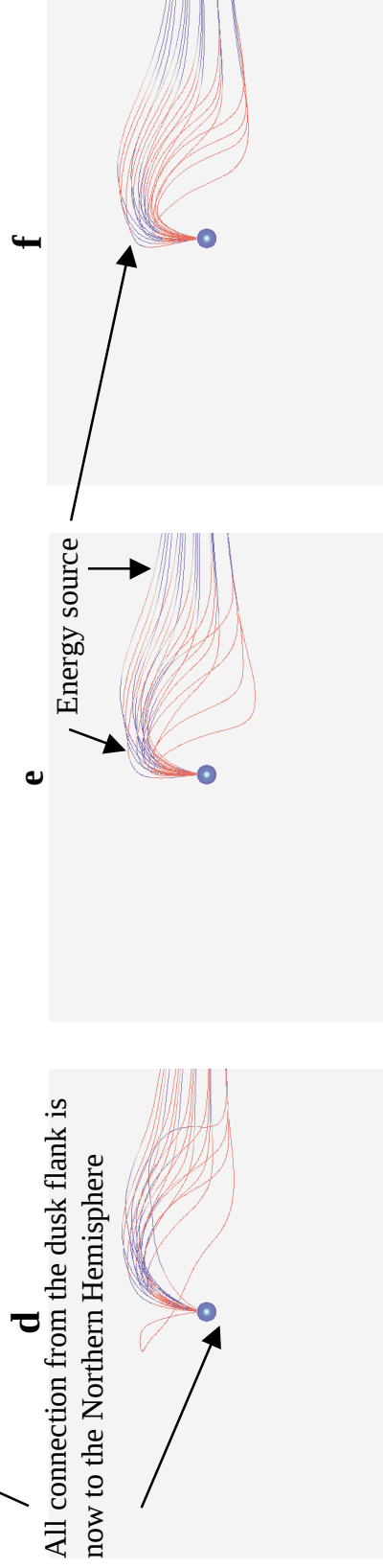


20

16

12

Traced from $X_{GSE} = -21.2$ (E), -24.6 (F), -27.9 (G), -31.3 (H); $Y_{GSE} = 50$; $Z_{GSE} = -2, -1, 0, 1, 2$



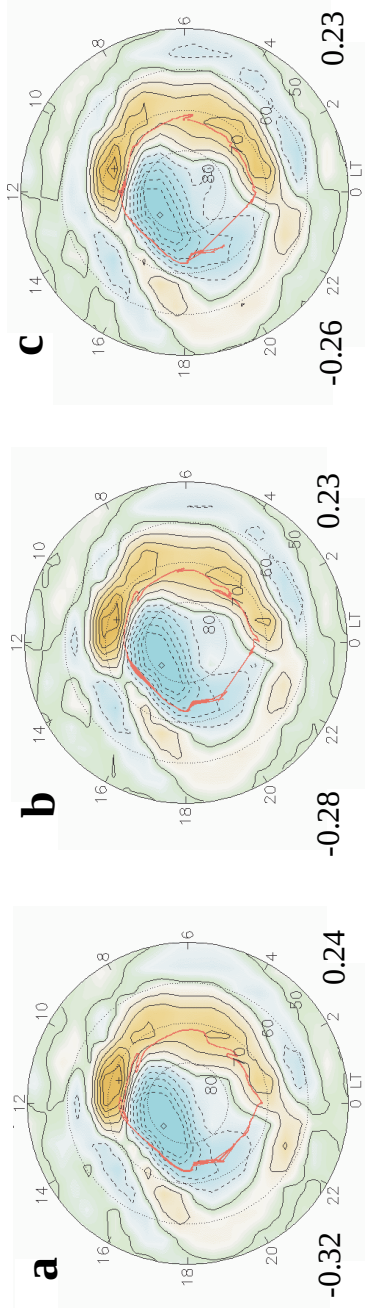
20

16

12

Time from first contact (min)

Merging starts 3 min

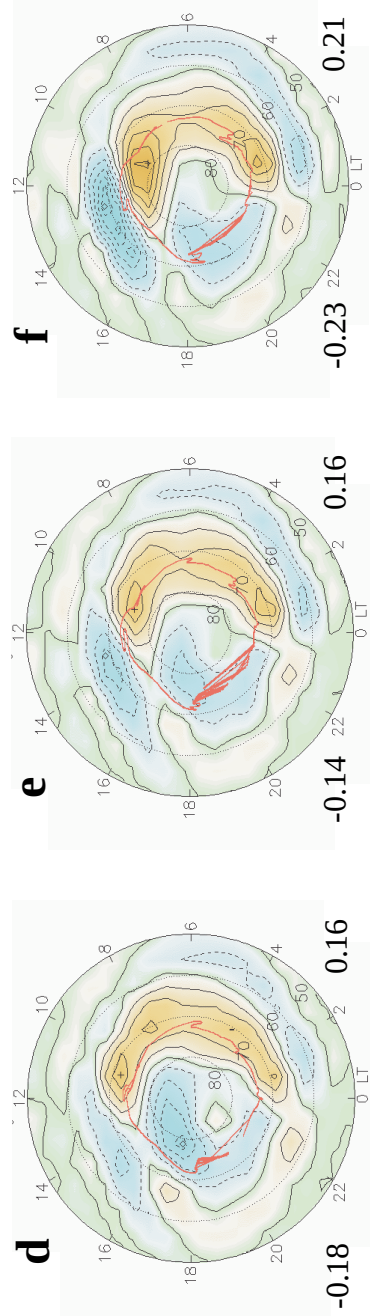


0 4 8

Field-aligned current
 $\mu\text{A m}^{-2}$

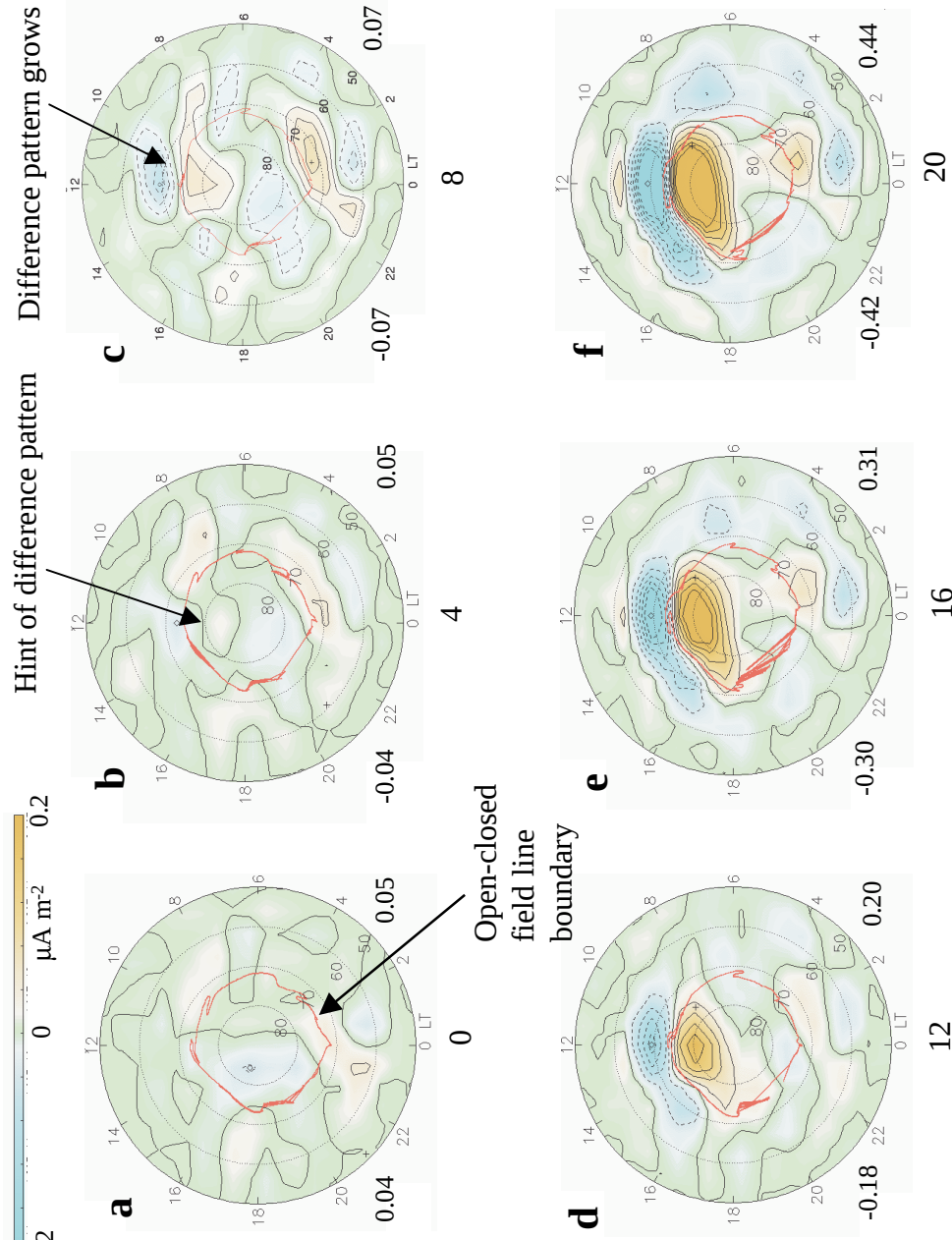
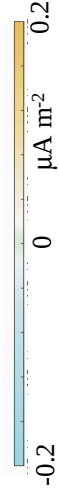
-0.20 0 0.20

ΔE pattern established



Time from first contact (min)

Field-Aligned Current
Differences from -2 min

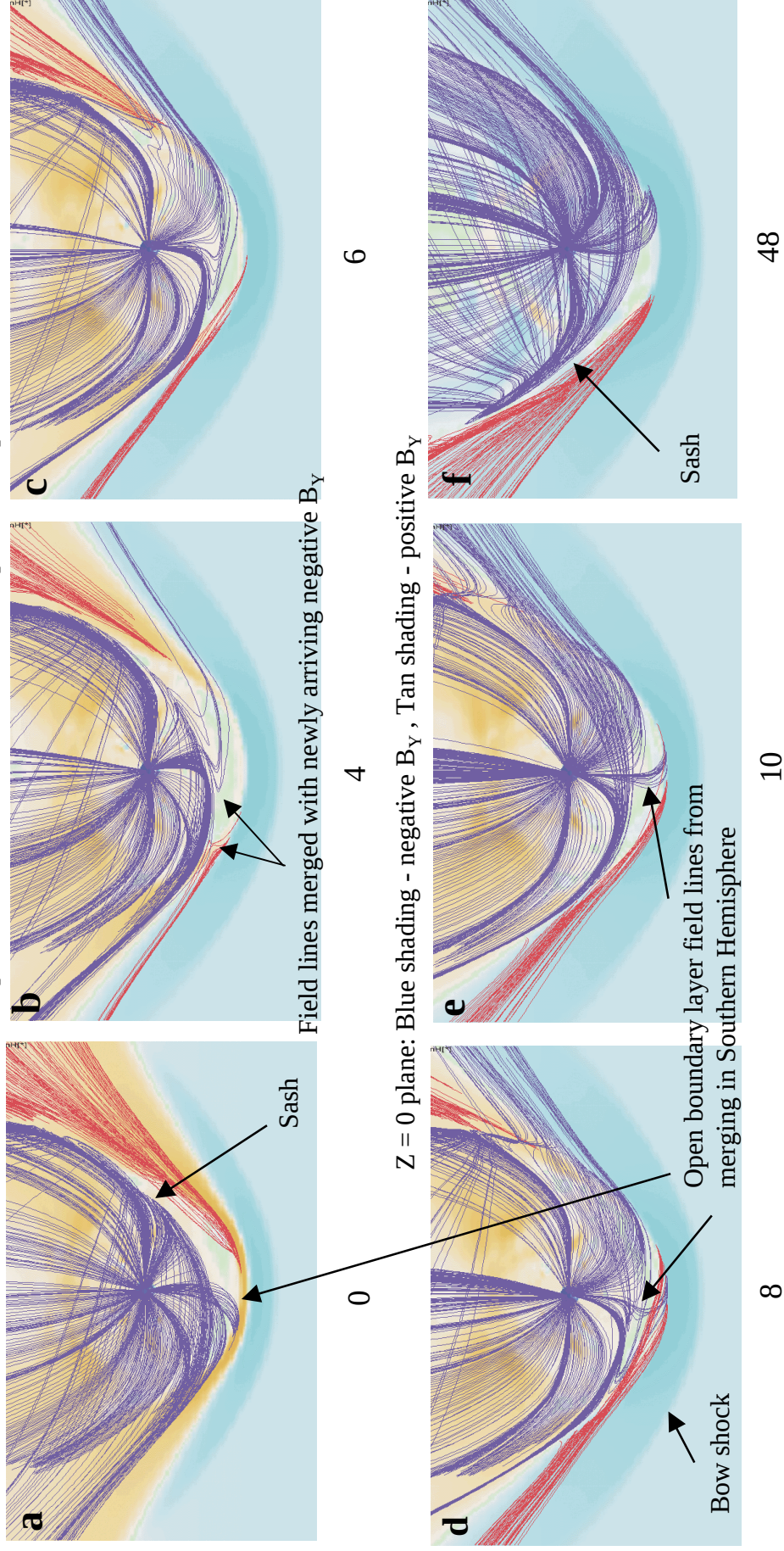


Time from first contact (min)

“First” open field lines traced from 50 km poleward of open/closed boundary in ionosphere

Blue lines: open field lines tied to Northern Hemisphere ionosphere

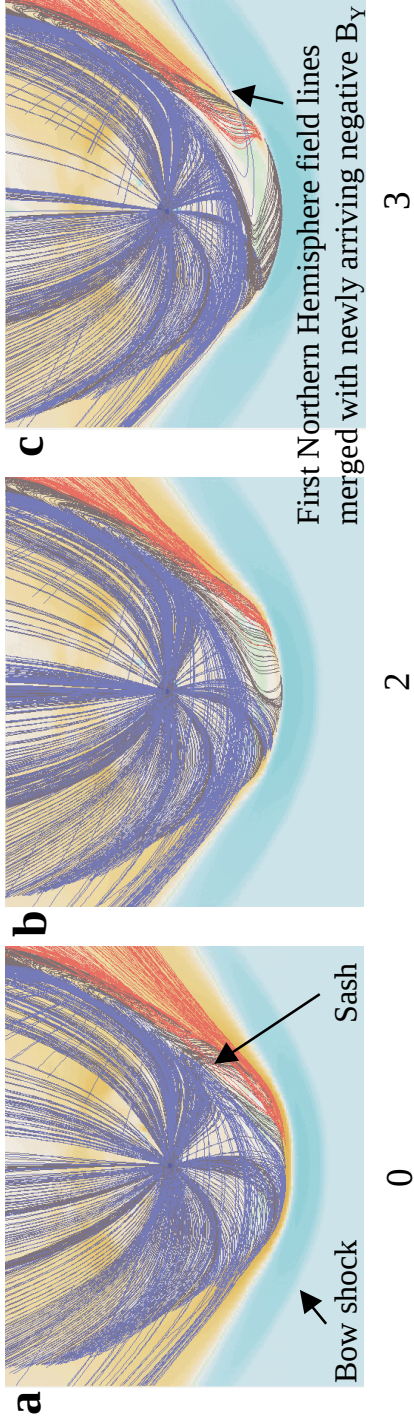
Red lines: open field lines tied to Southern Hemisphere ionosphere



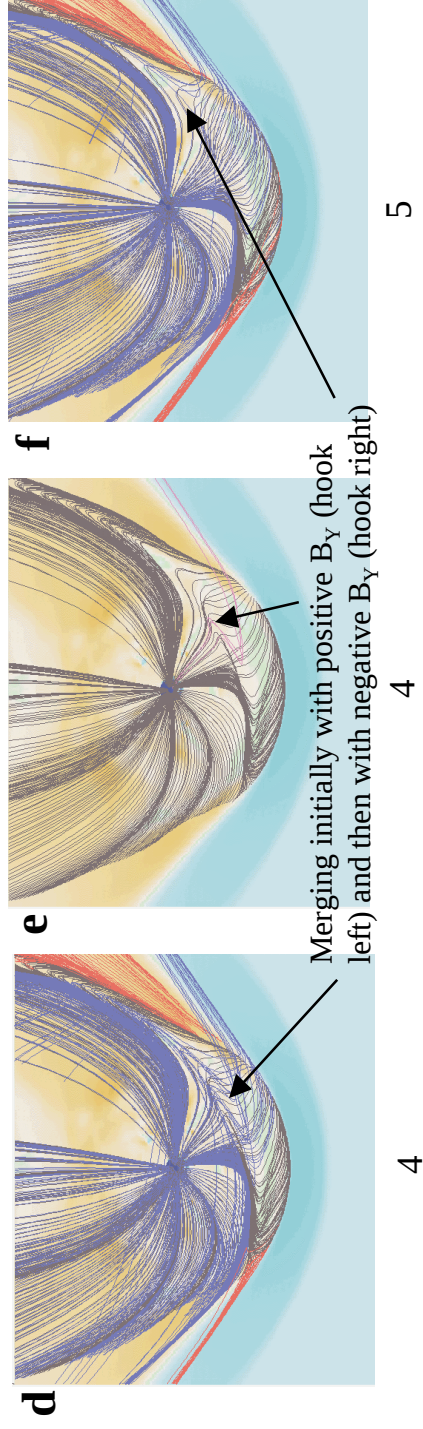
“First” open field lines traced from 25 km poleward of open/closed boundary in ionosphere

Blue lines: open field lines tied to Northern Hemisphere ionosphere

Red lines: open field lines tied to Southern Hemisphere ionosphere

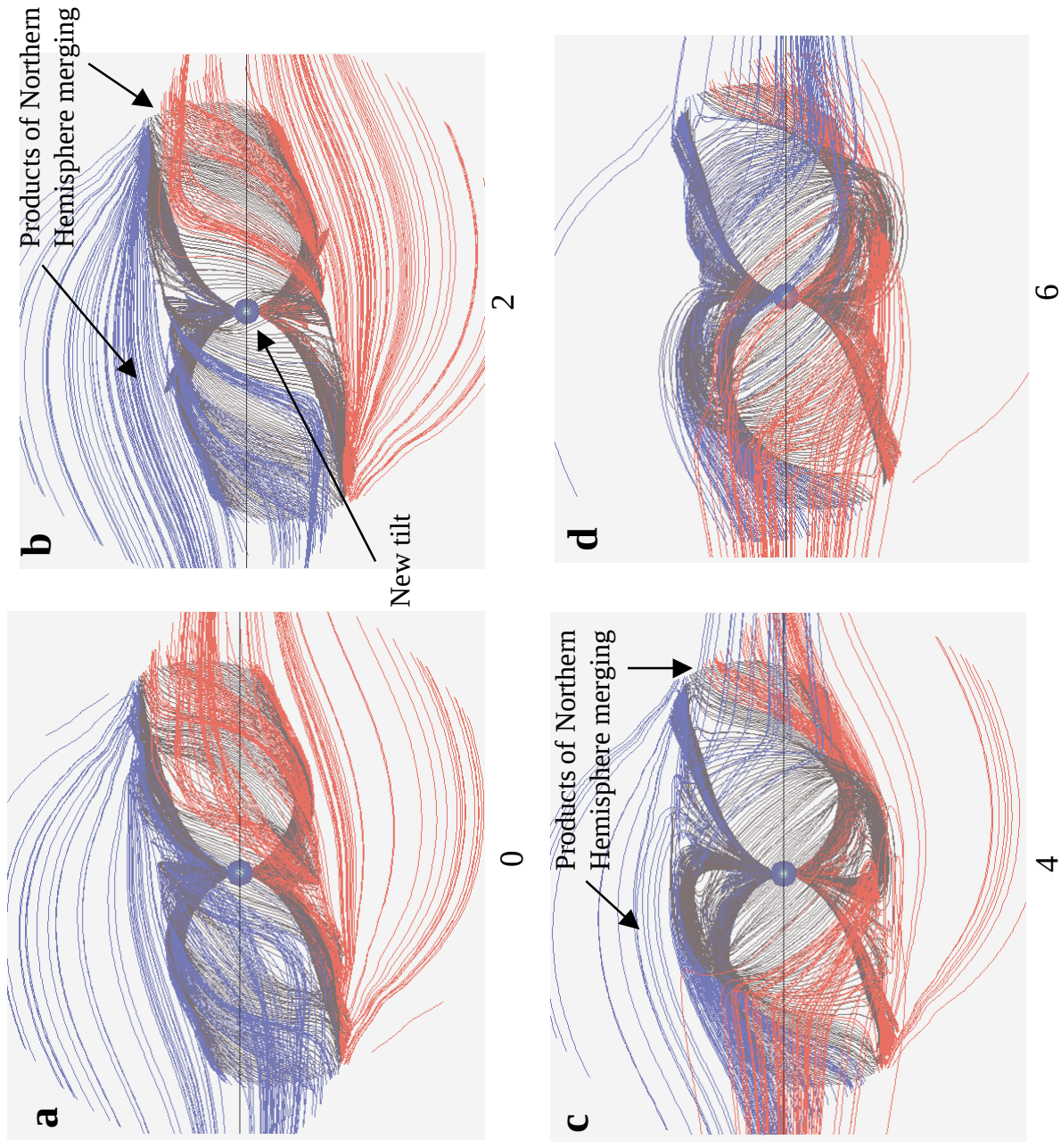


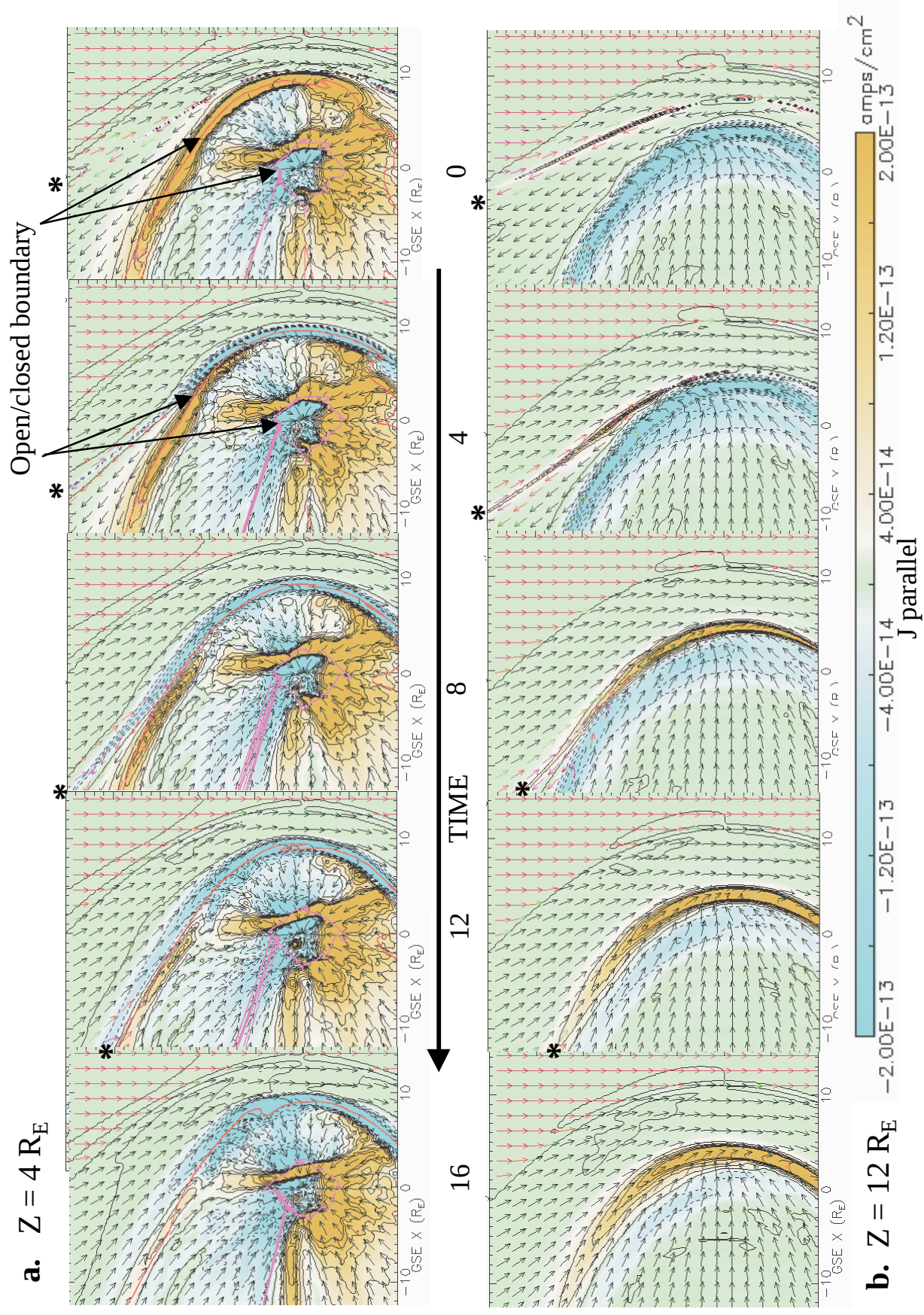
$Z = 0$ plane: Blue shading - negative B_Y , Tan shading - positive B_Y



Time from first contact (min)

Field line tracings: black - closed, blue - open from Northern Hemisphere ionosphere, red - open from southern hemisphere ionosphere





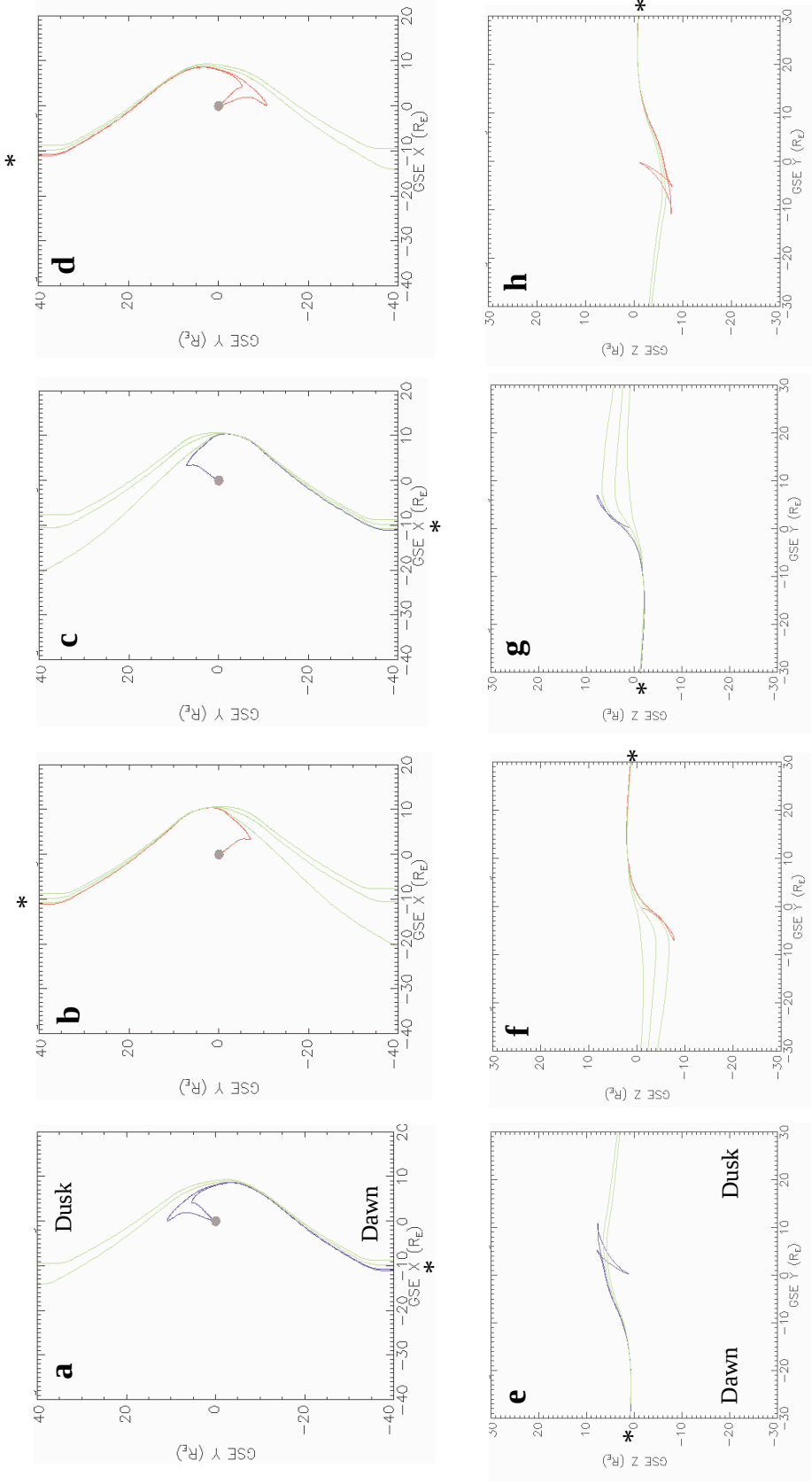


Plate 12

