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Ionospheric control of magnetospheric dynamics: How the ionospheric conductance and outflow effect the magnetotail

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Yellowstone
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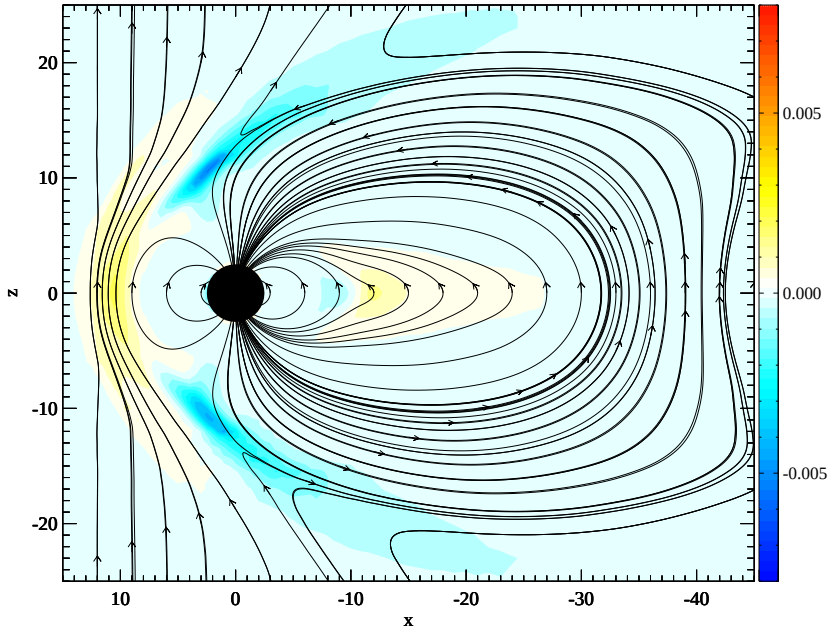
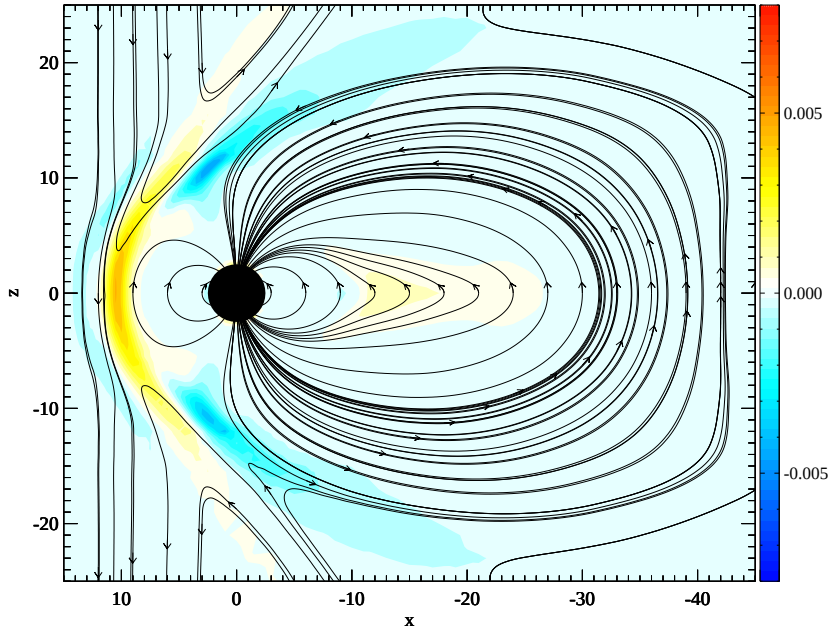
No Outflow, Inner Boundary = 10 cm^{-3}

Initial State (1 min.)



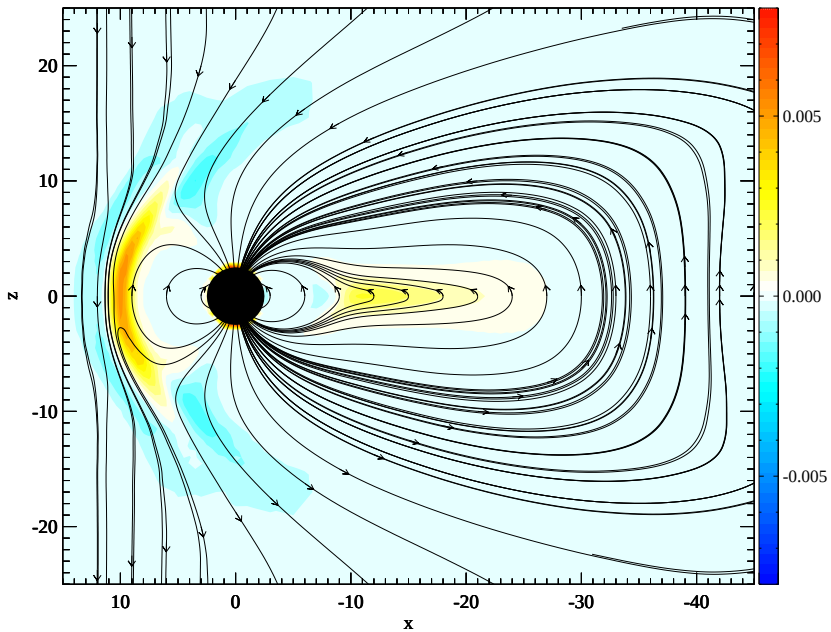
nx= 7136, 1, it= 5319, time= 60.014

After B_z South (7 min.)



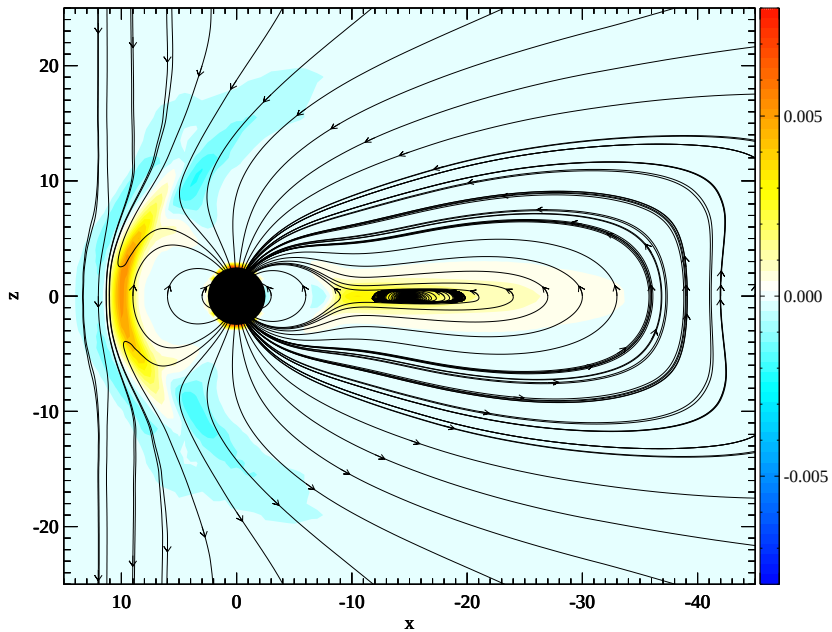
nx= 7136, 1, it= 28227, time= 420.02

Thin Tail (23 min.)



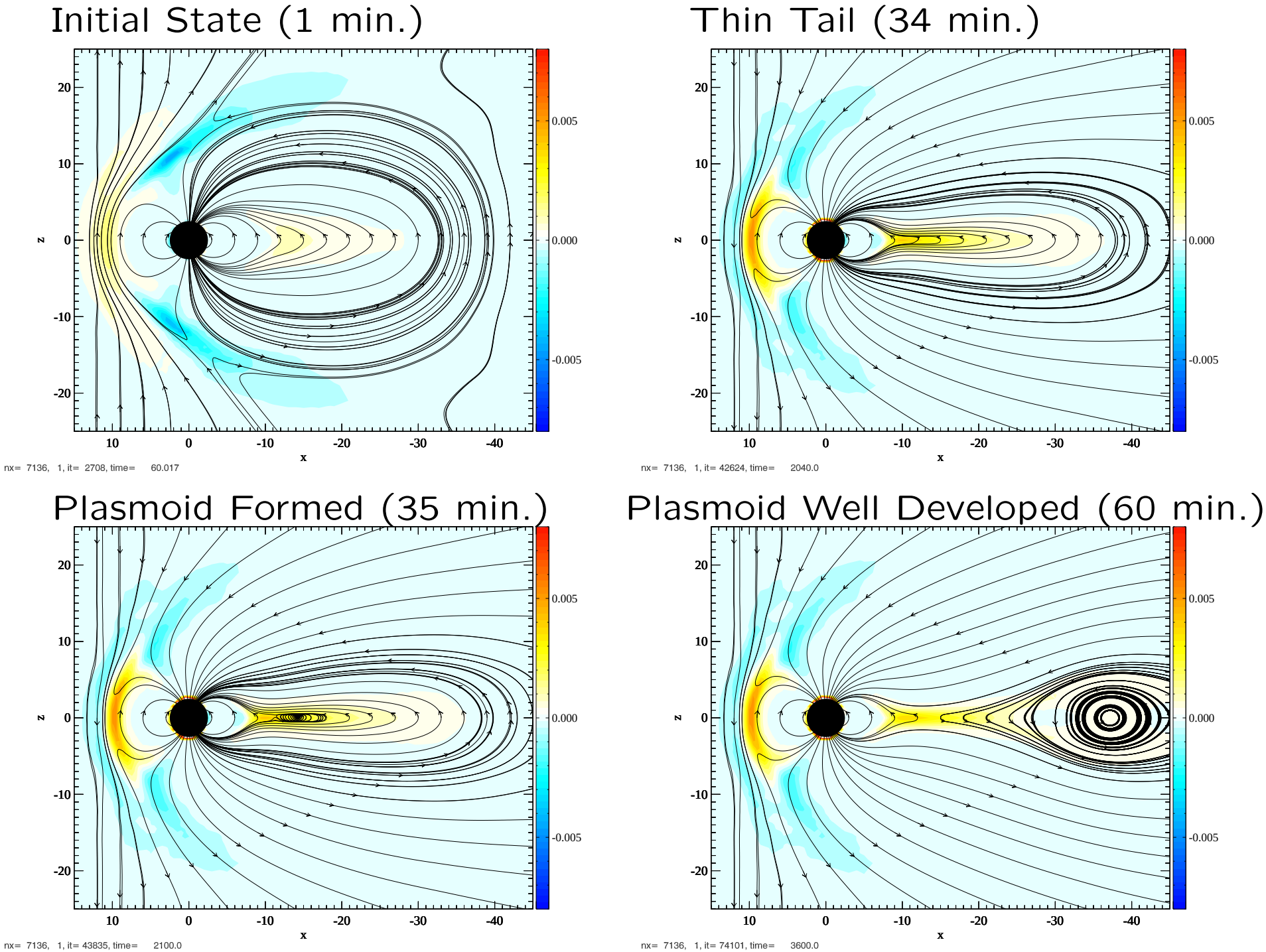
nx= 7136, 1, it= 70277, time= 1080.0

Plasmoid Formed (24 min.)



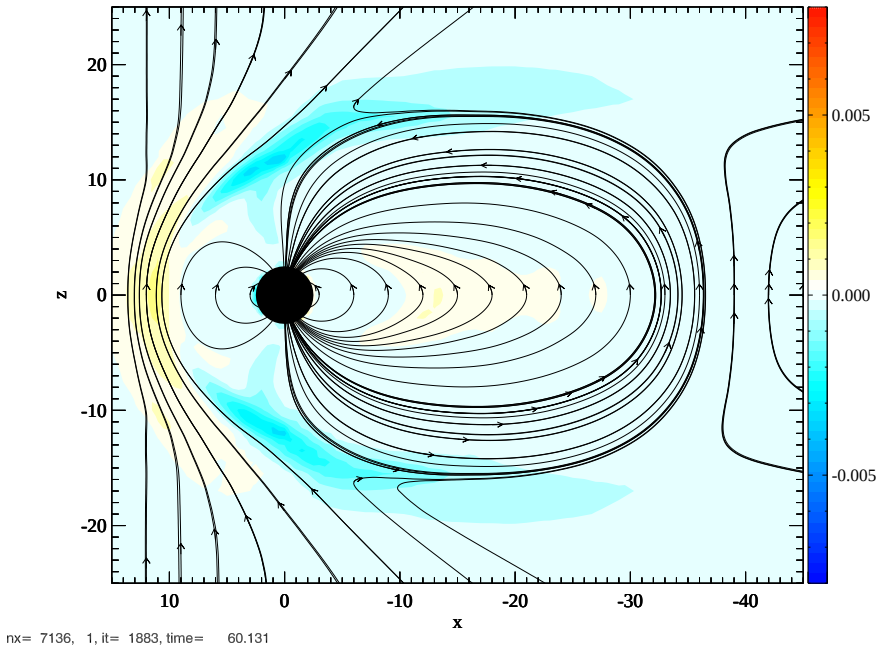
nx= 7136, 1, it= 89328, time= 1380.0

No Outflow, Inner Boundary = 100 cm^{-3}

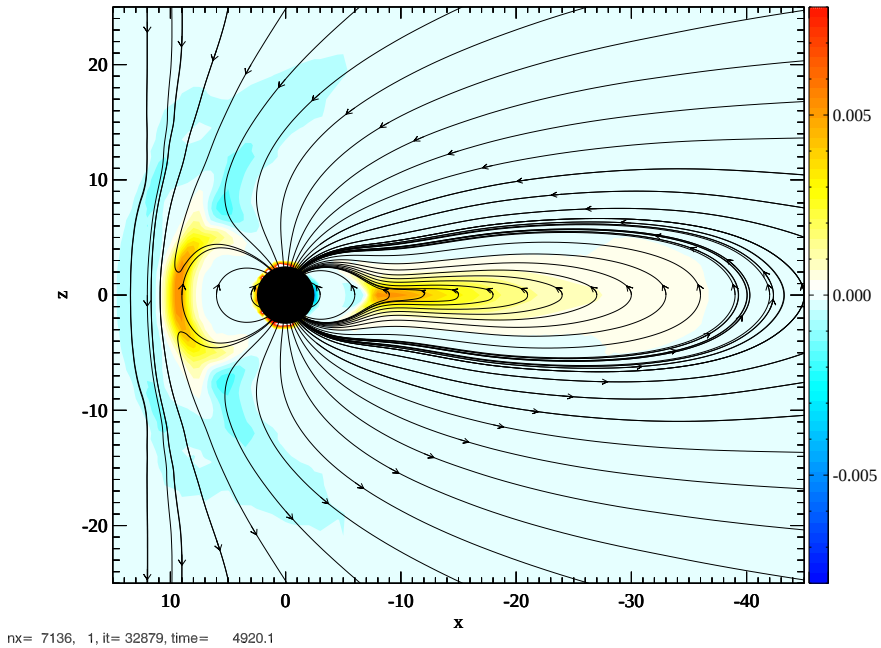


No Outflow, Inner Boundary = 1000 cm^{-3}

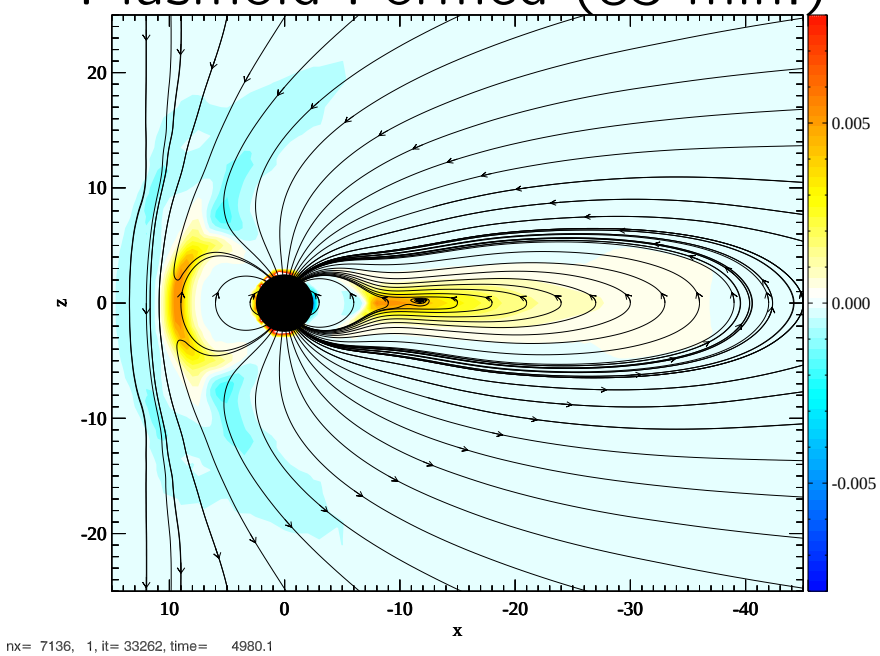
Initial State (1 min.)



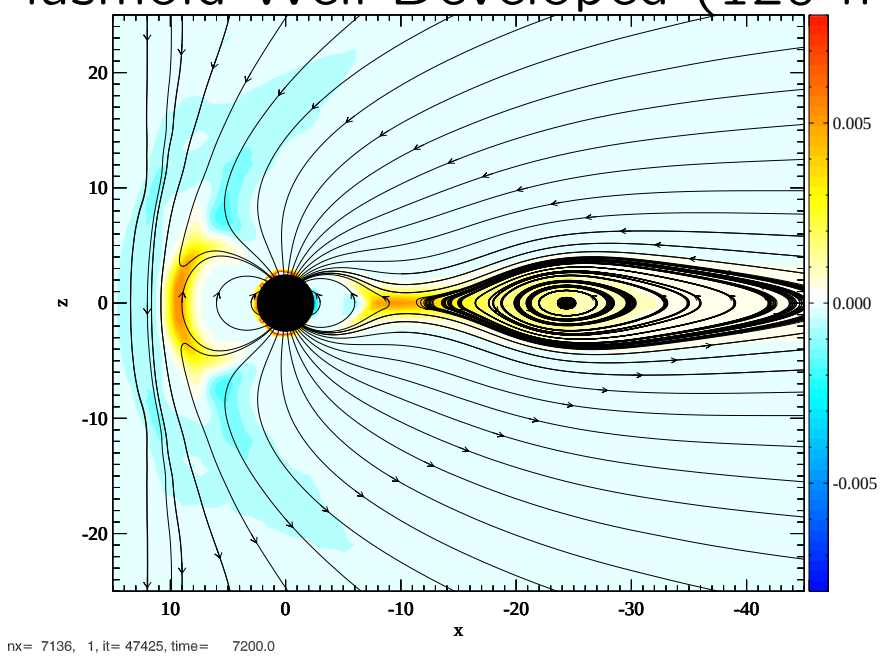
Thin Tail (82 min.)



Plasmoid Formed (83 min.)

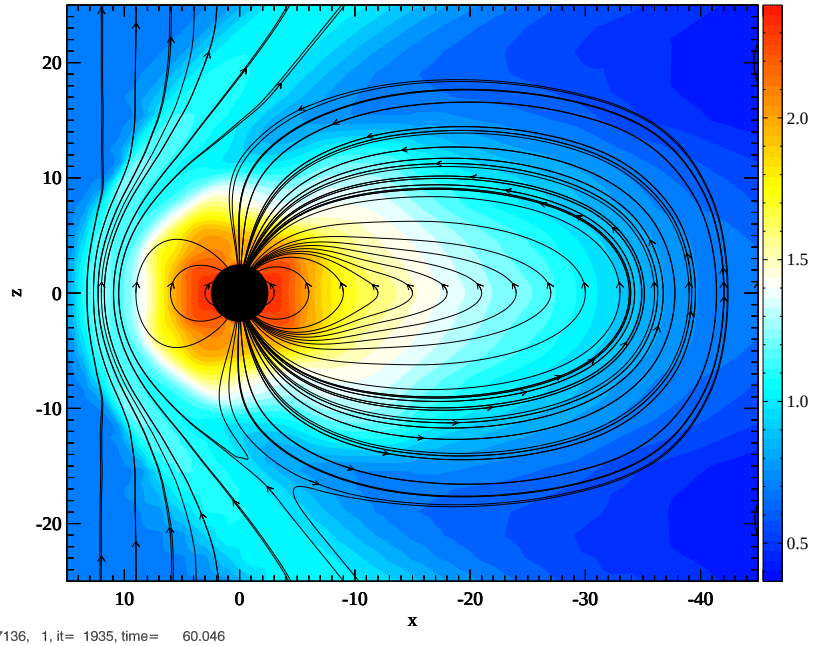


Plasmoid Well Developed (120 min.)

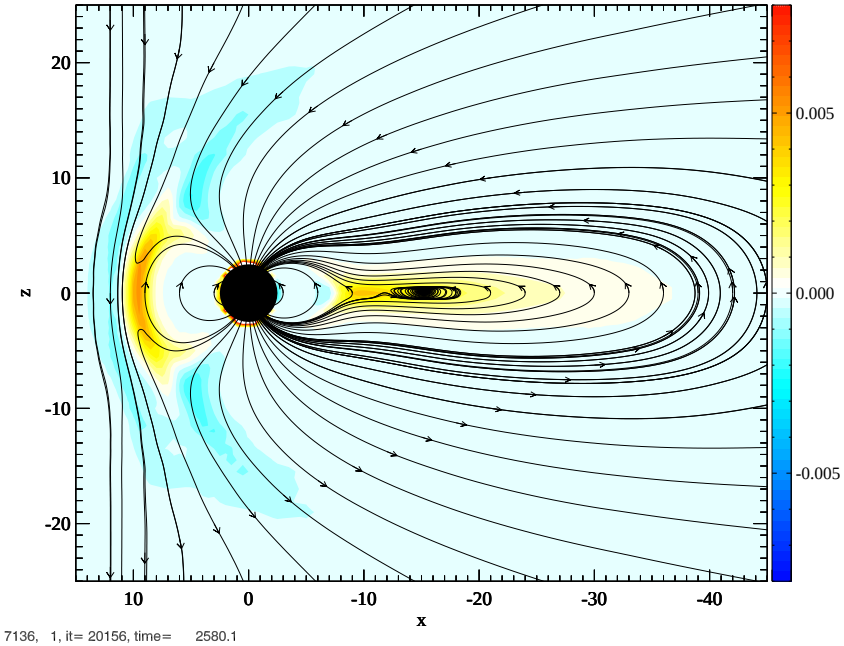


No Outflow, Inner Boundary = 25 - 250 cm^{-3}

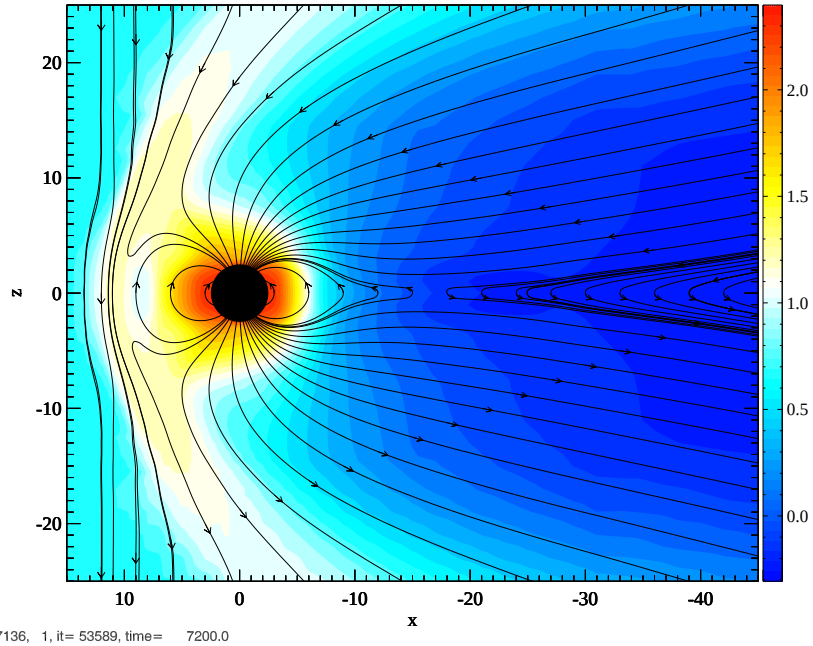
Initial State (1 min. - rho)



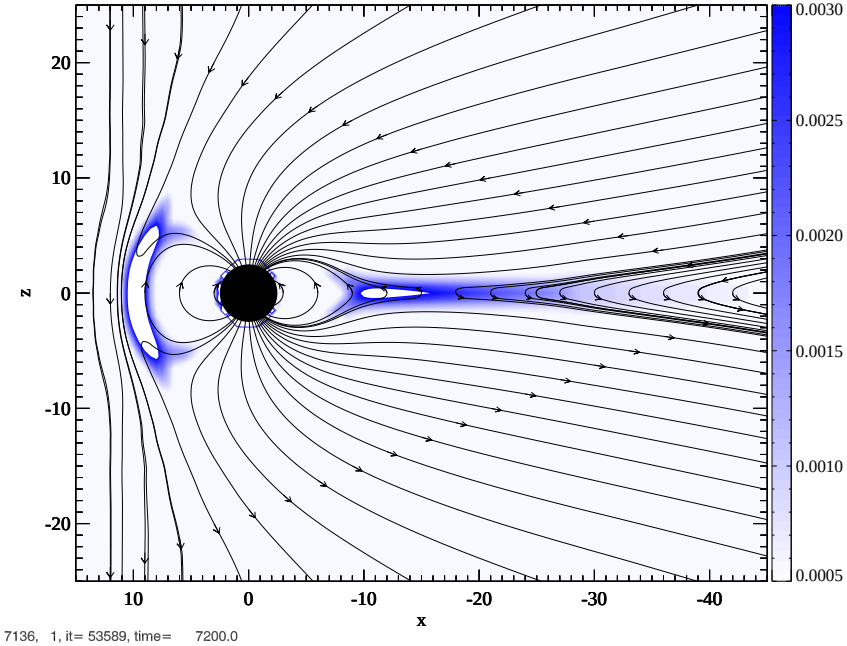
Plasmoid Formed (43 min.)



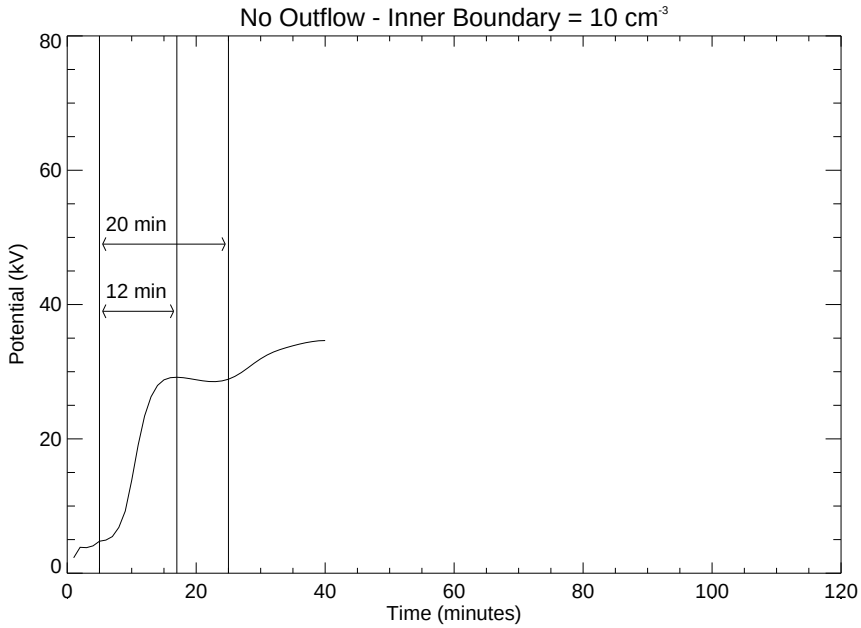
Final State (120 min. - rho)

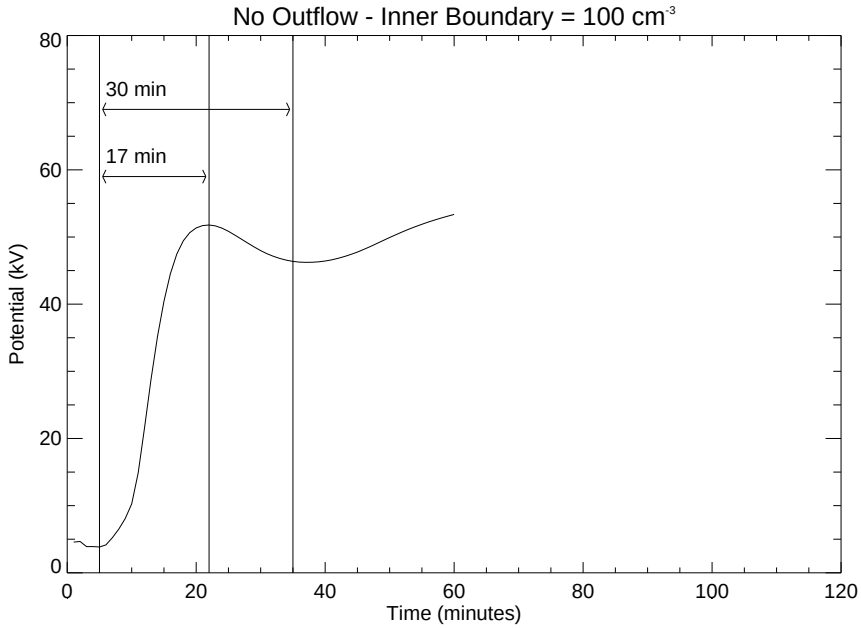


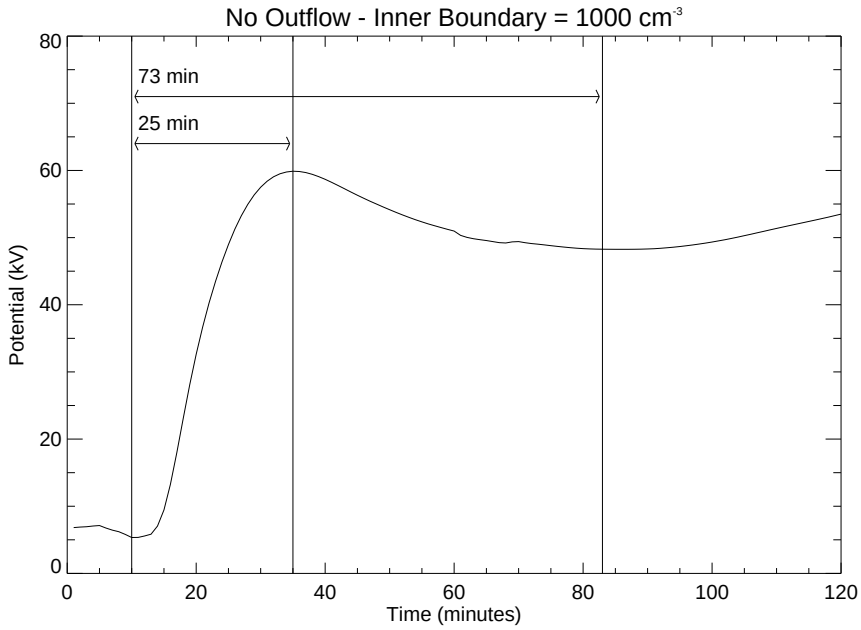
Final State (120 min. - current)



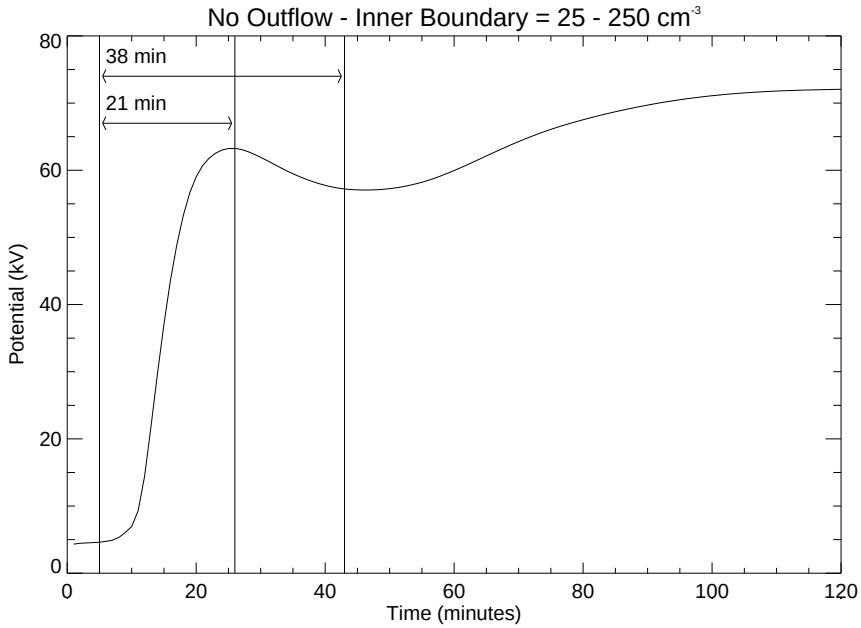
Ionospheric Response

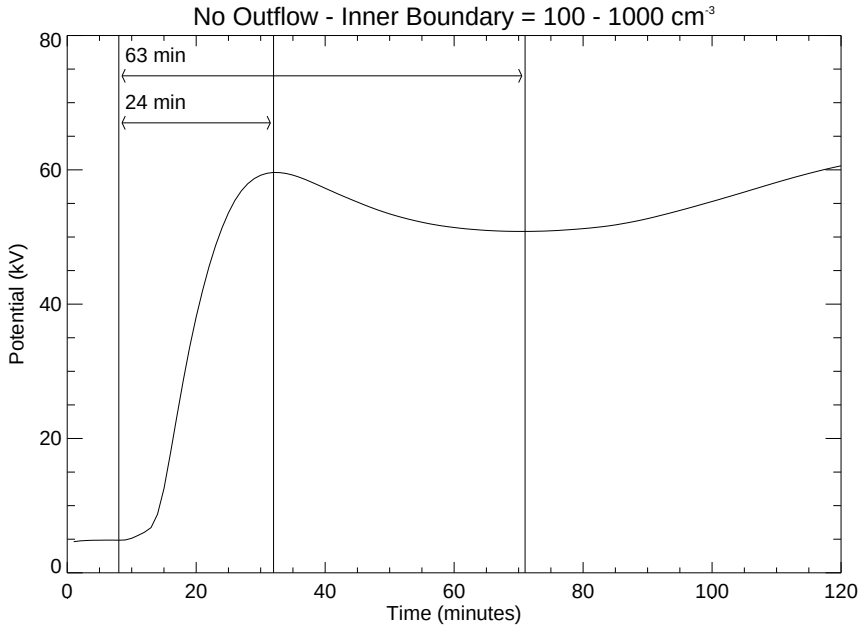






Ionospheric Response - 2





Conclusions

- The density in the magnetosphere can control the length of time in which the ionosphere takes to reconfigure.
- The density in the magnetosphere controls the strength of the CPCP.
- The density in the magnetosphere controls the time it takes for a plasmoid to form.
- The density in the magnetosphere controls the length of the tail.