

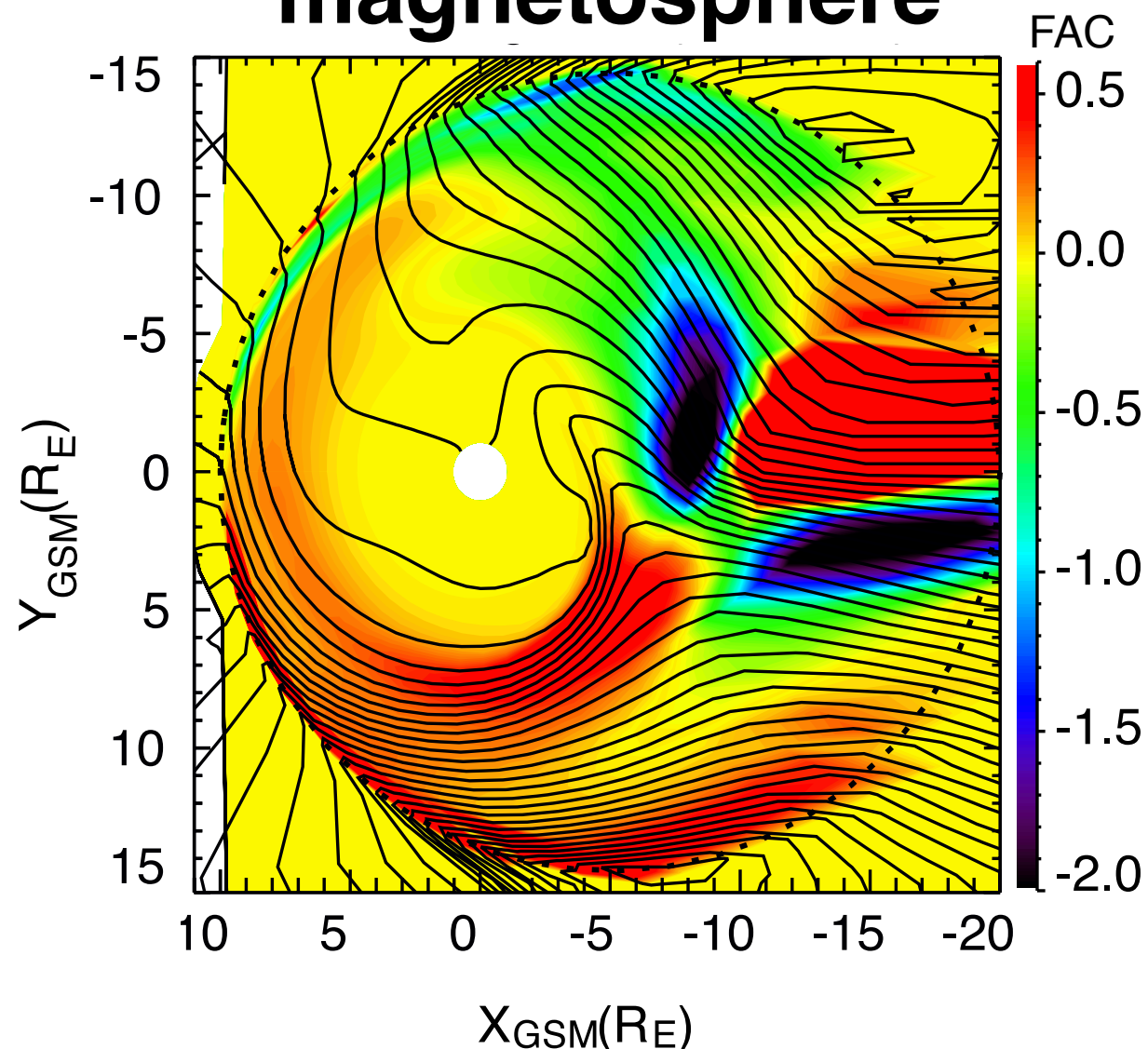
Physics of region-2 FACs, Harang reversal, and SAPS

Chih-Ping Wang, Matina Gkioulidou, Larry R. Lyons 

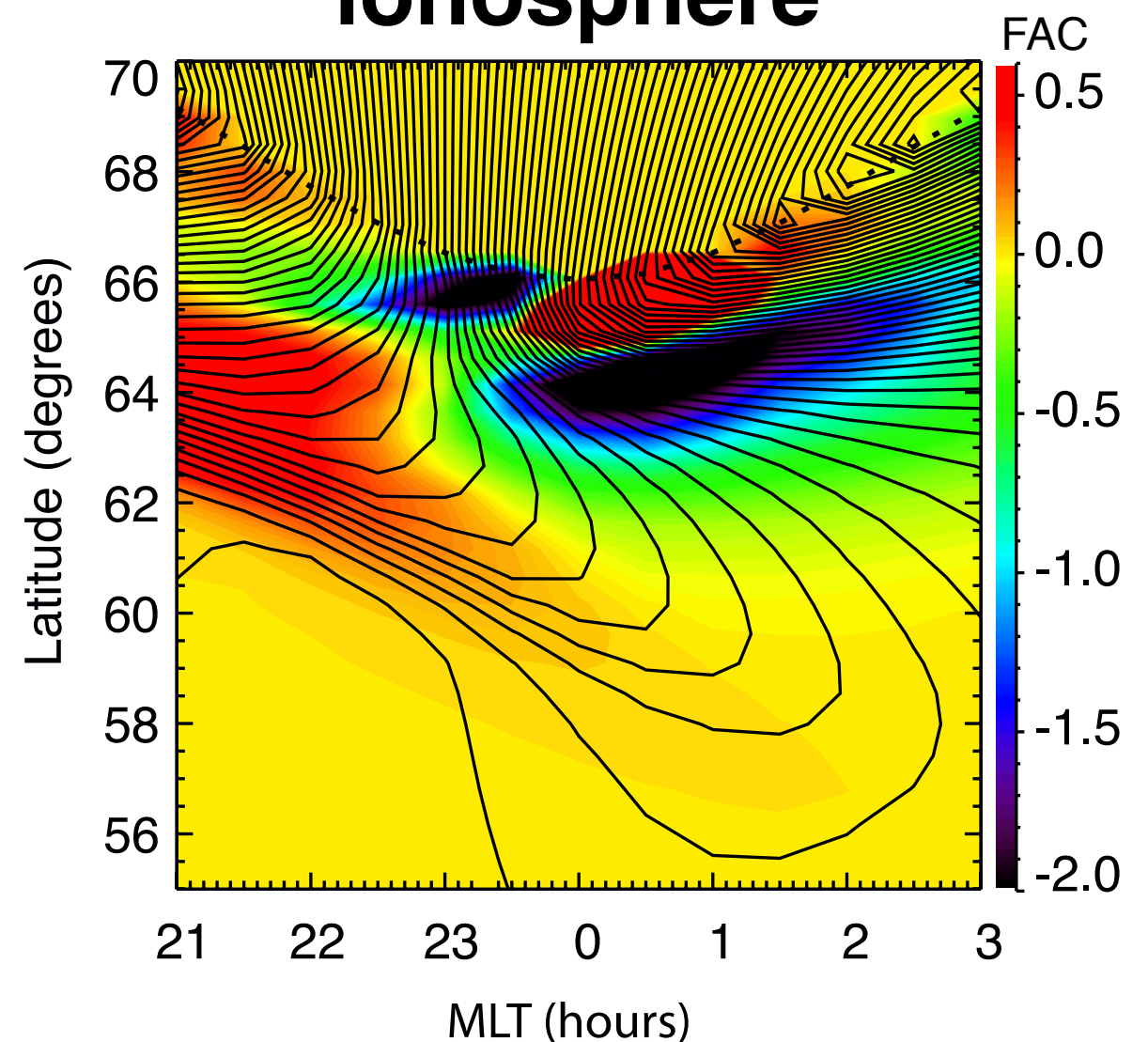
Rice Convection Model (RCM)

- electric and magnetic drift of protons and electrons
- M-I coupling: current continuity

magnetosphere



ionosphere



Physics of **region-2 FACs**, Harang reversal, and SAPS

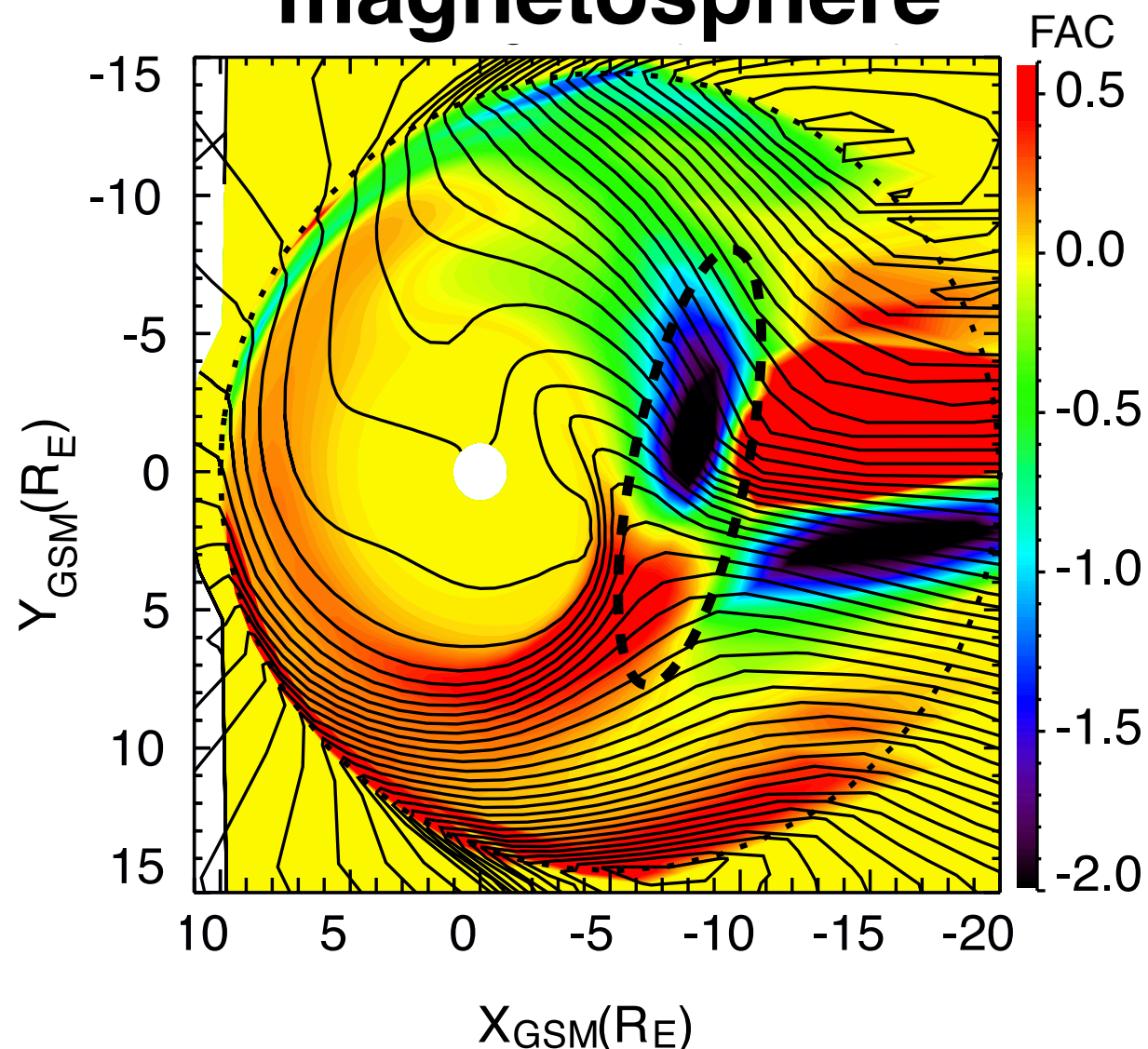
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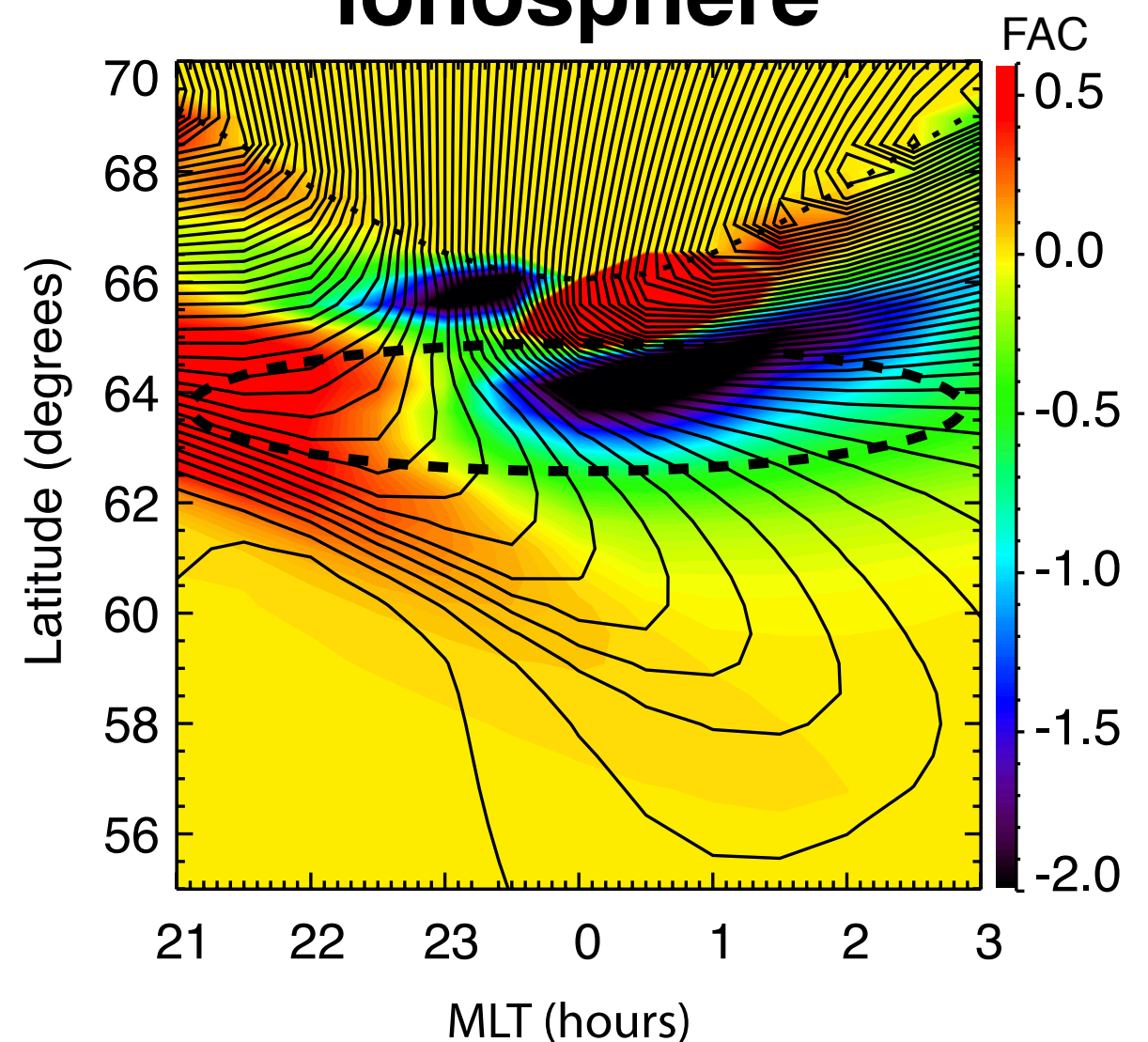
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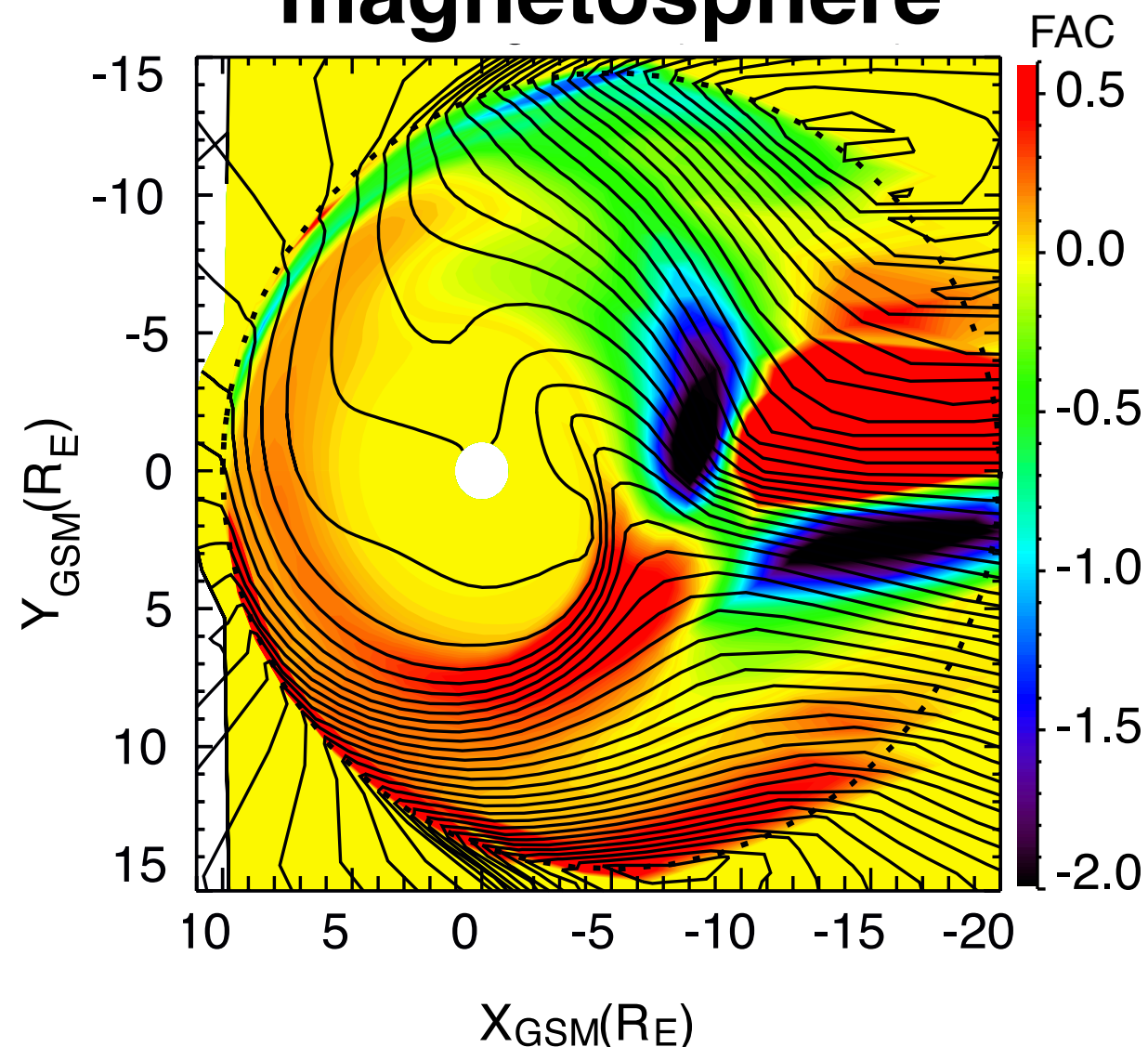
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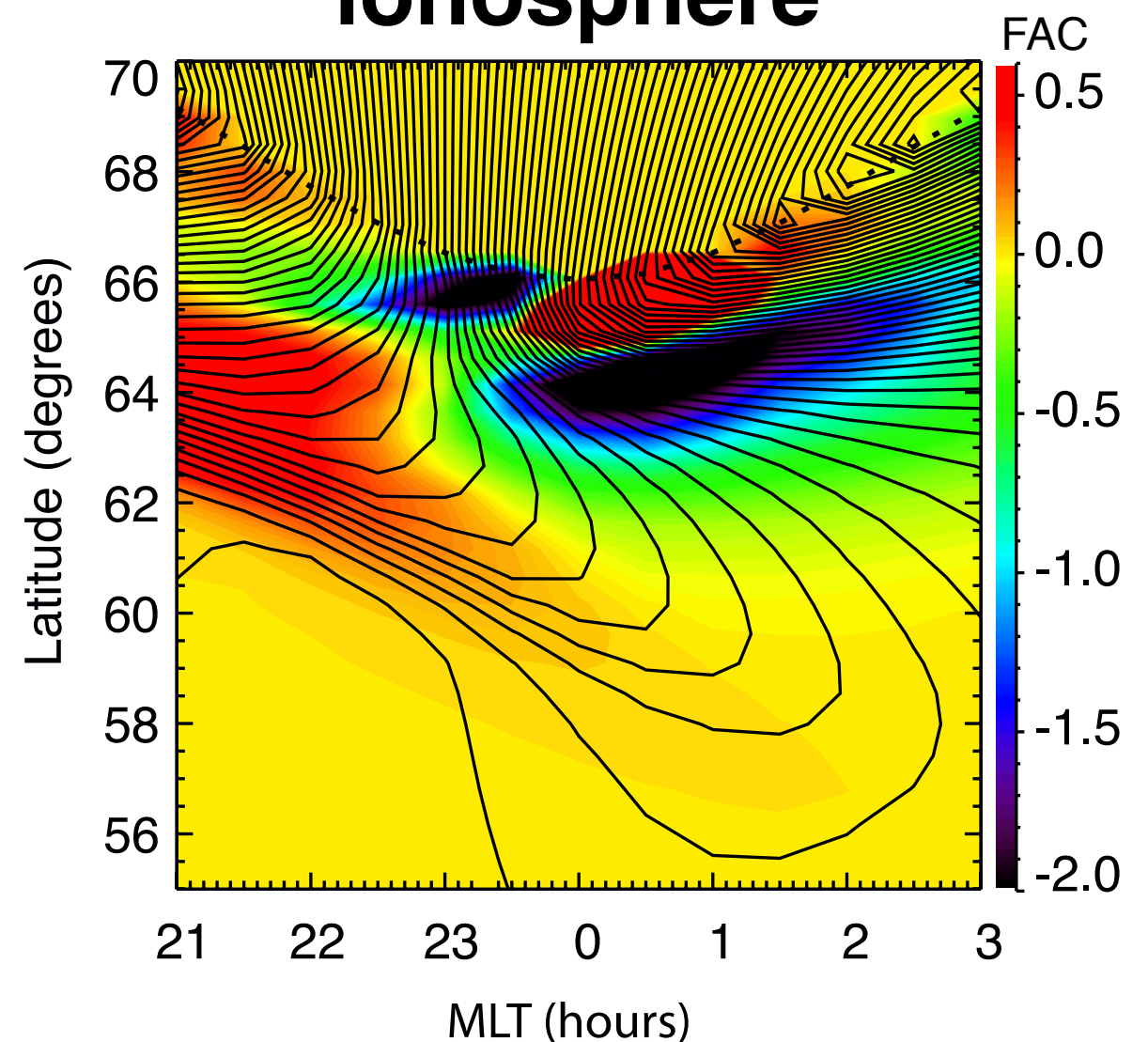
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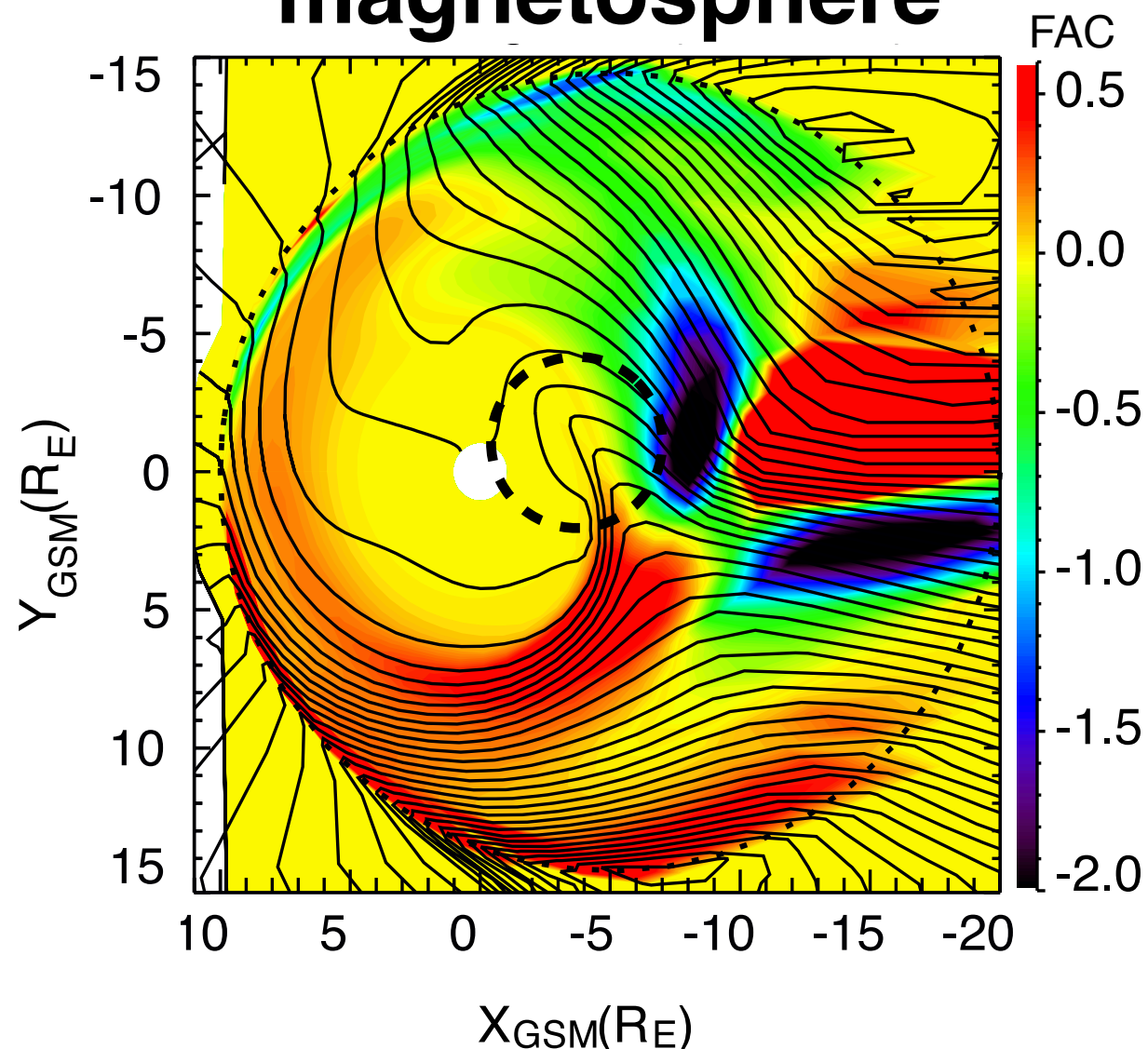
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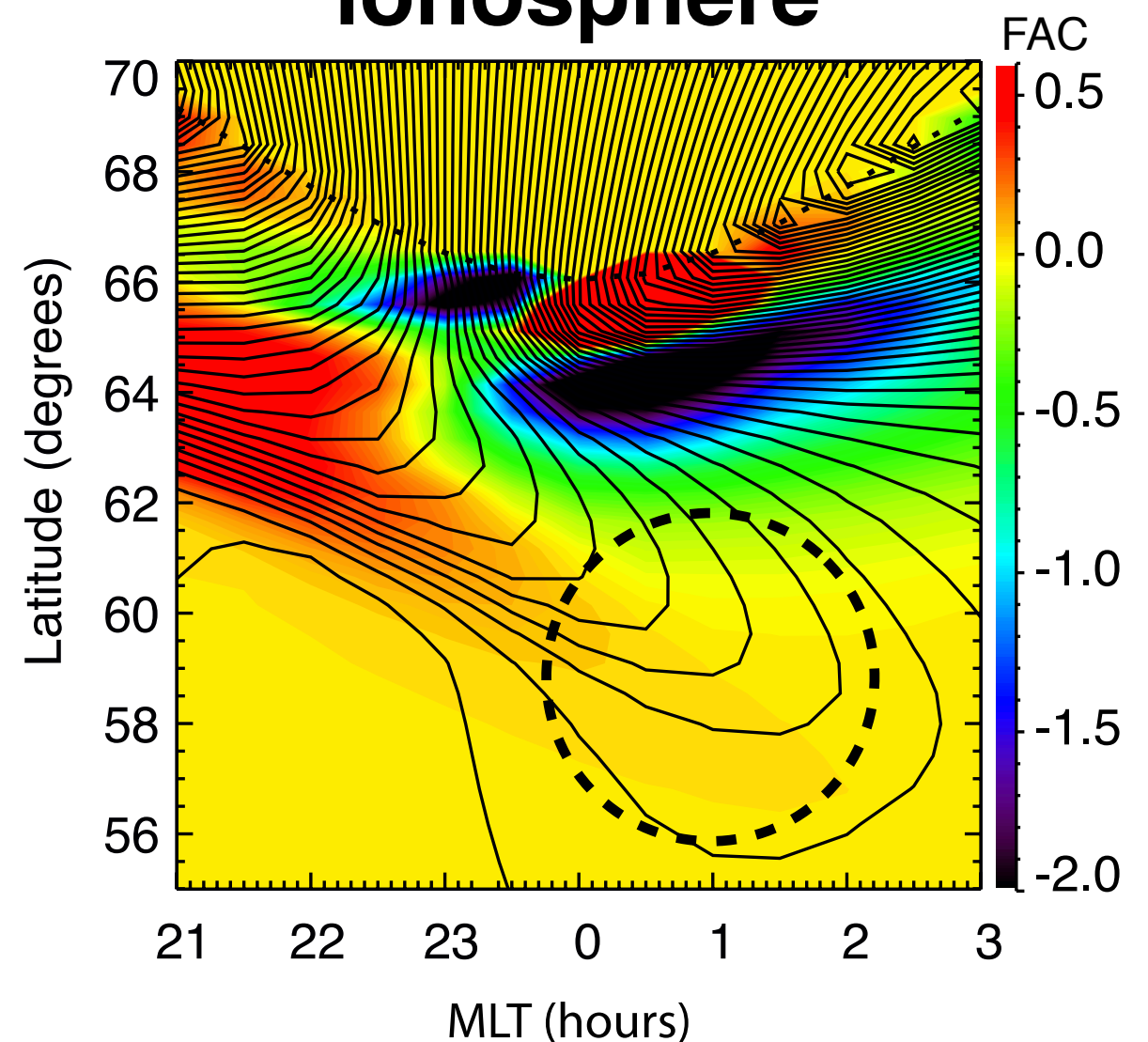
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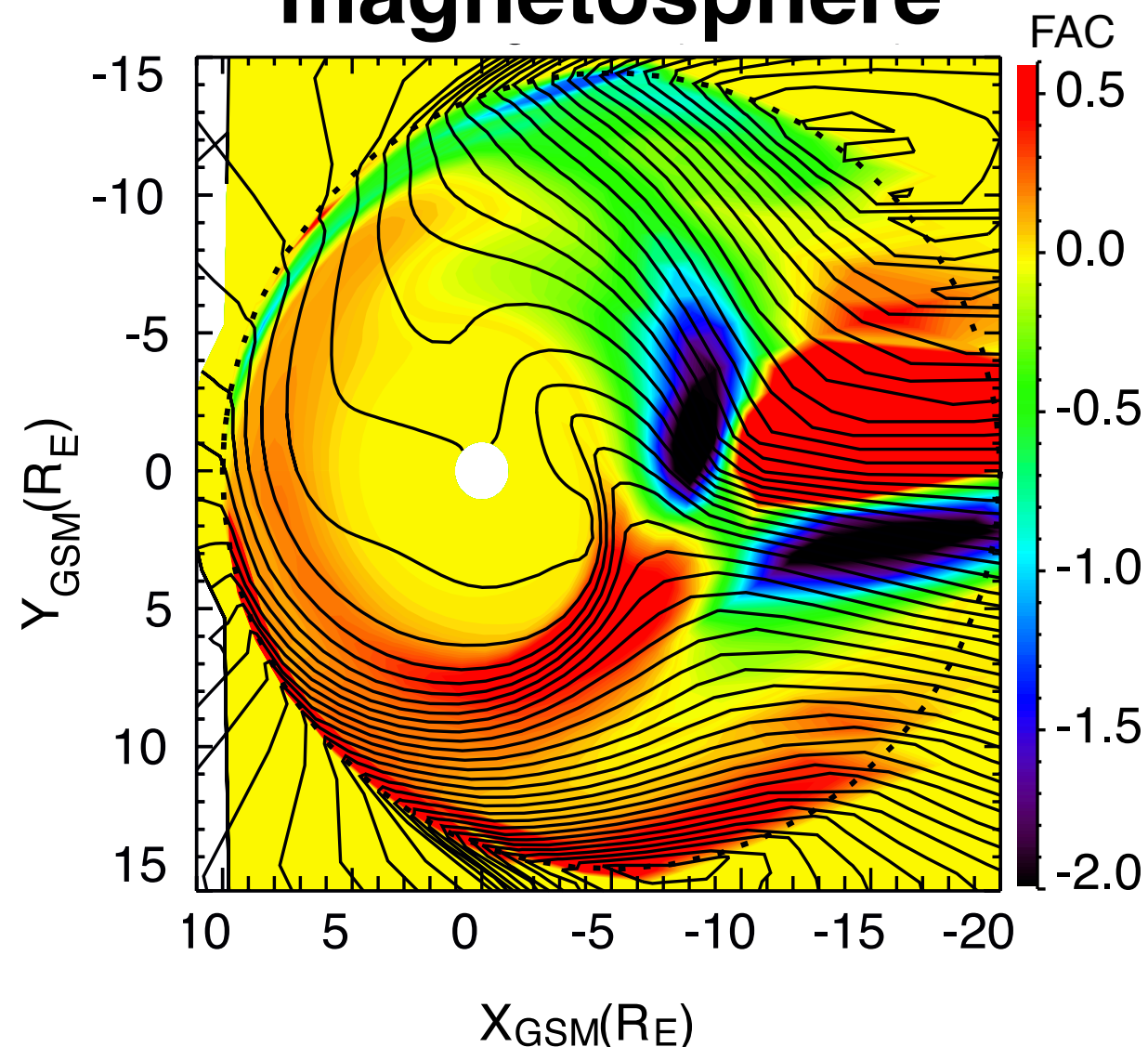
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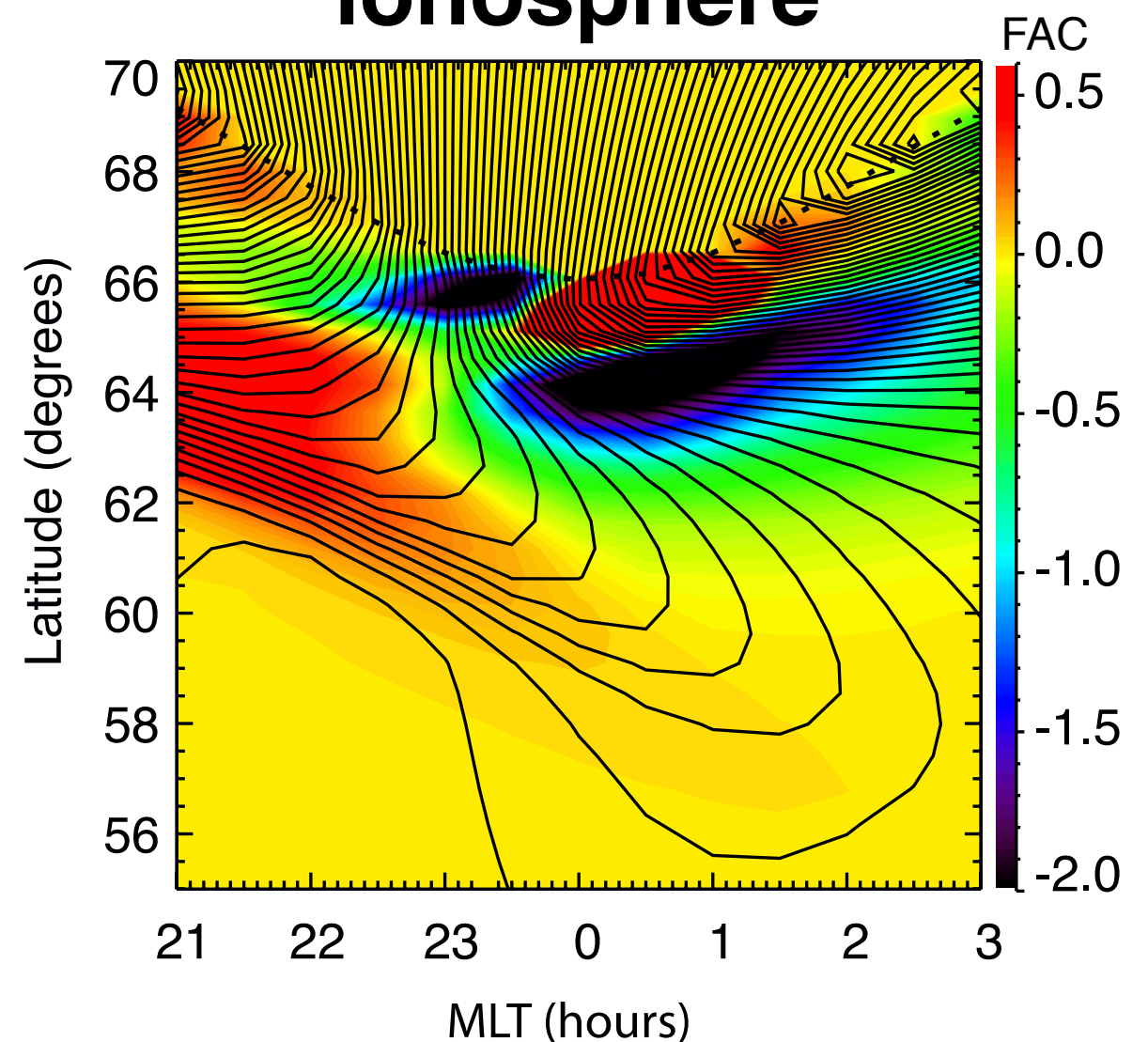
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Physics of region-2 FACs, Harang reversal, and **SAPS**

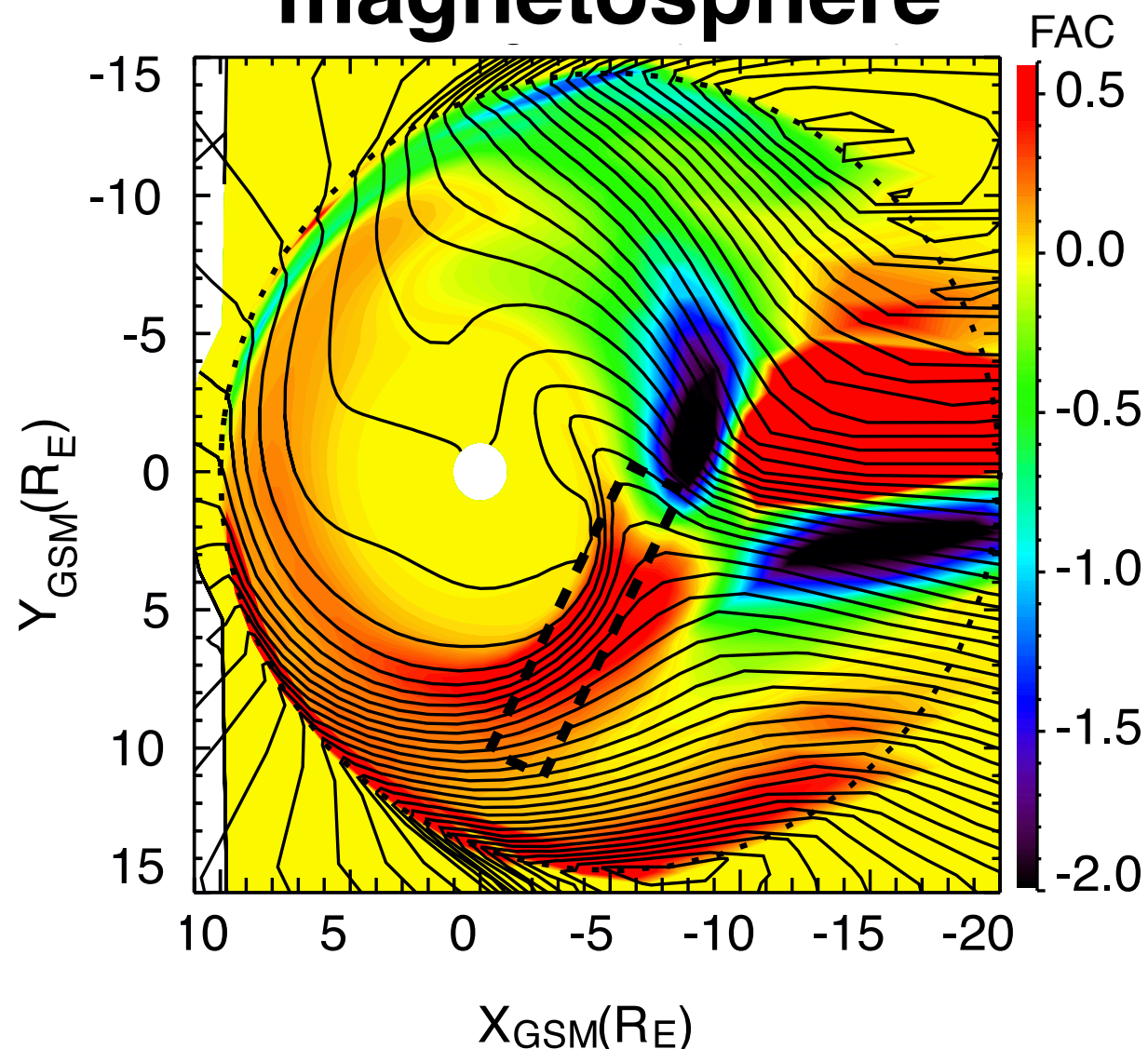
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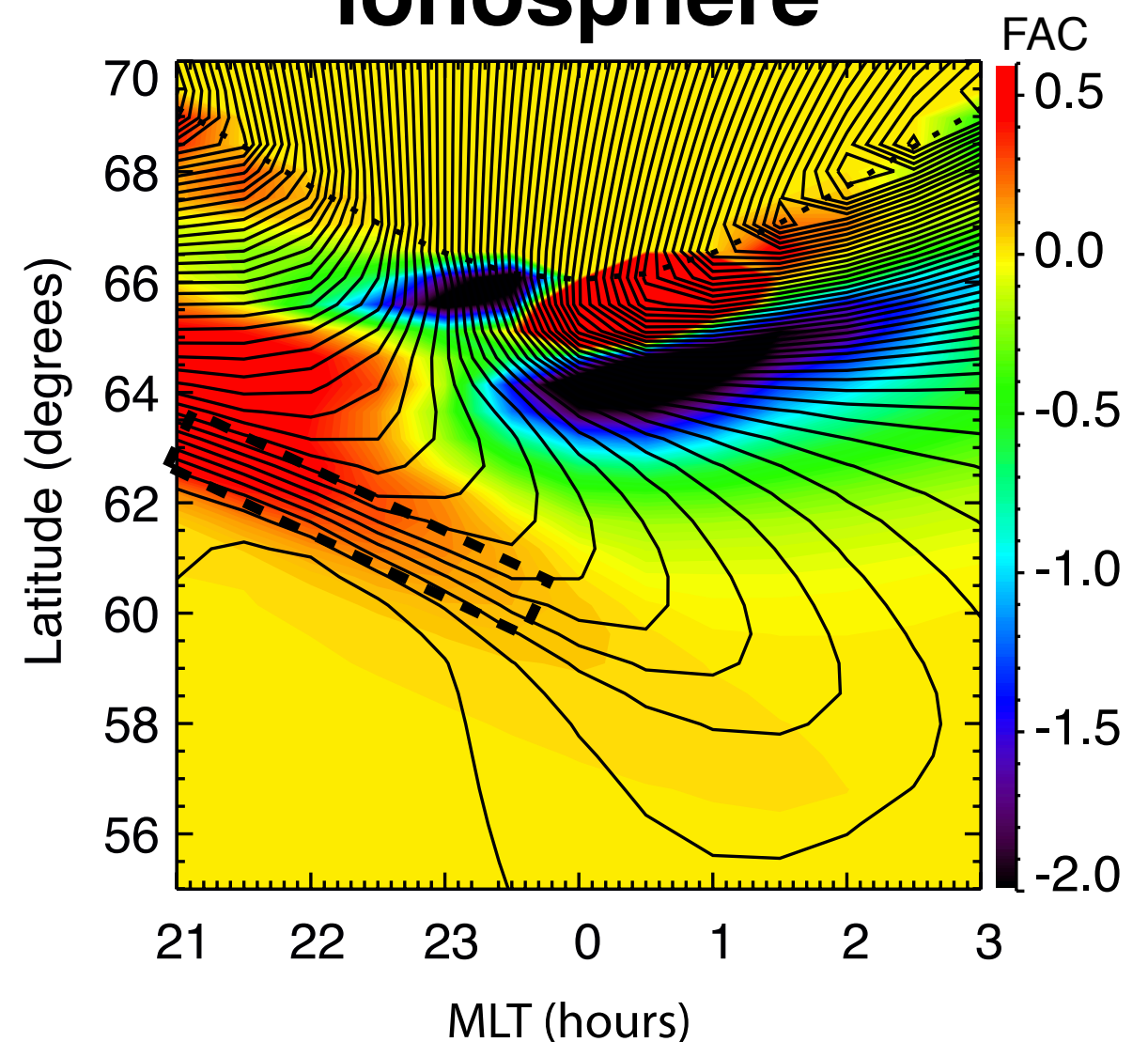
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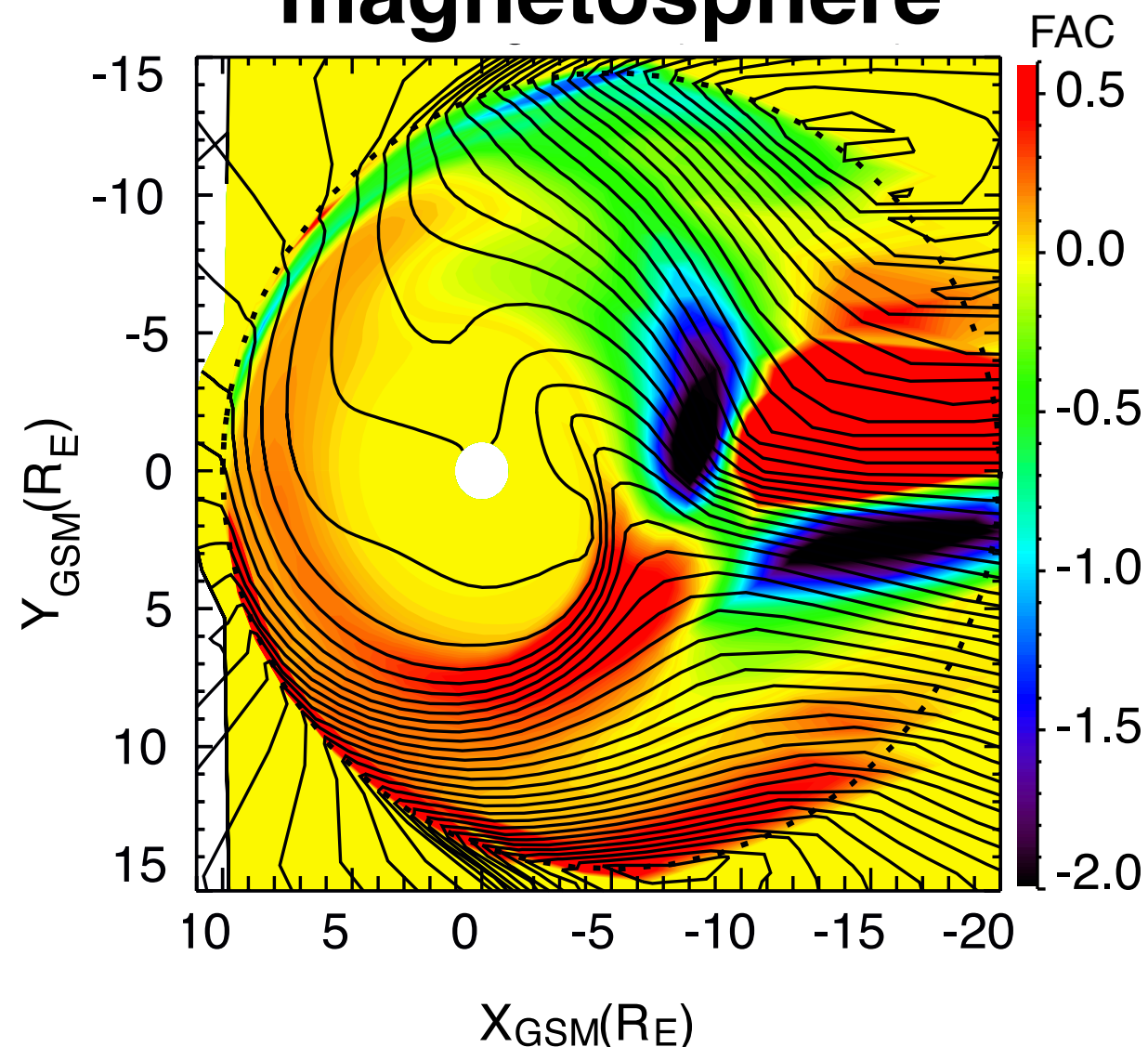
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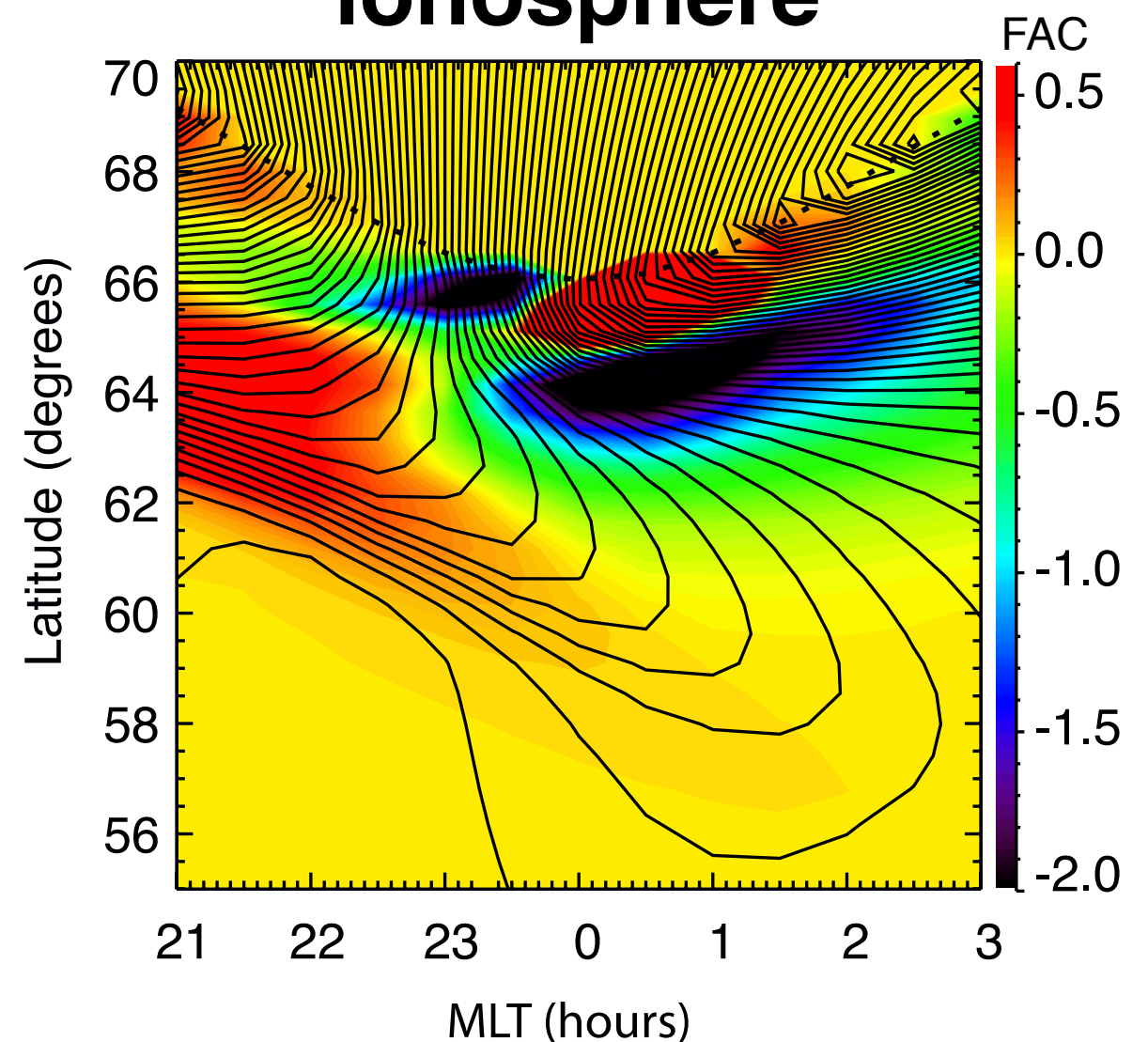
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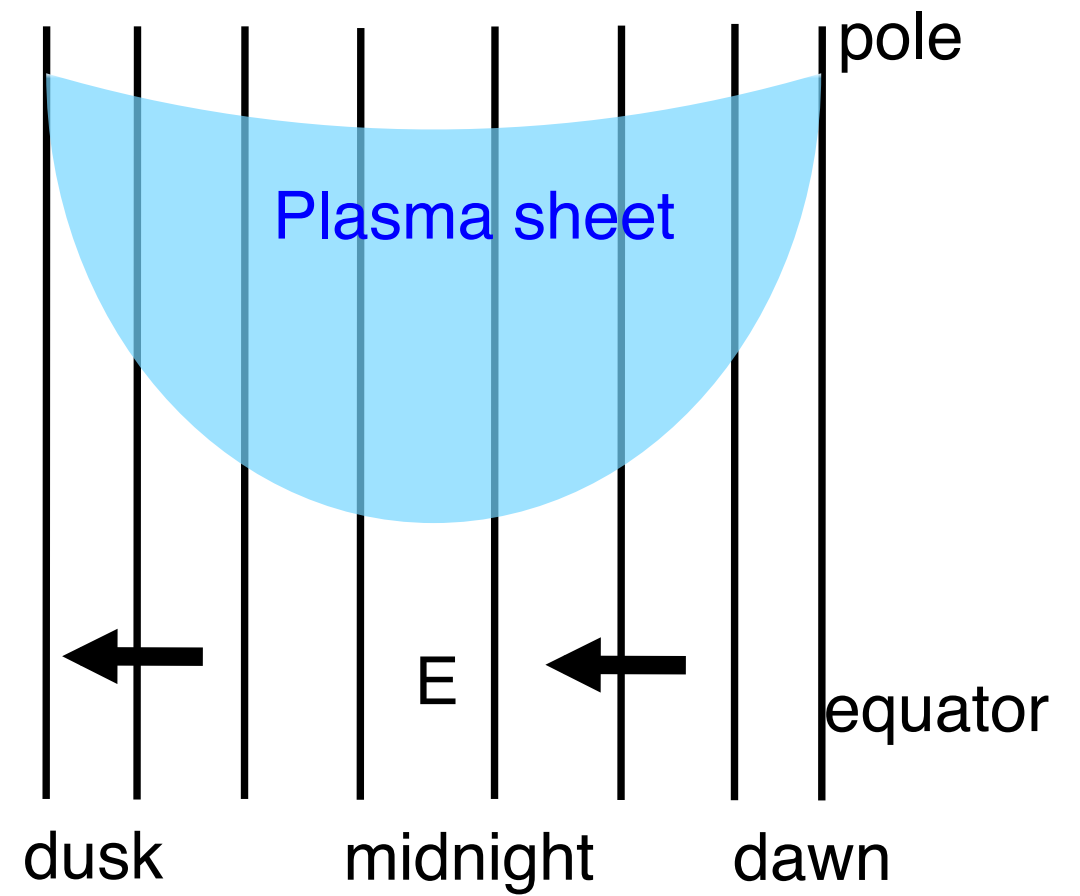
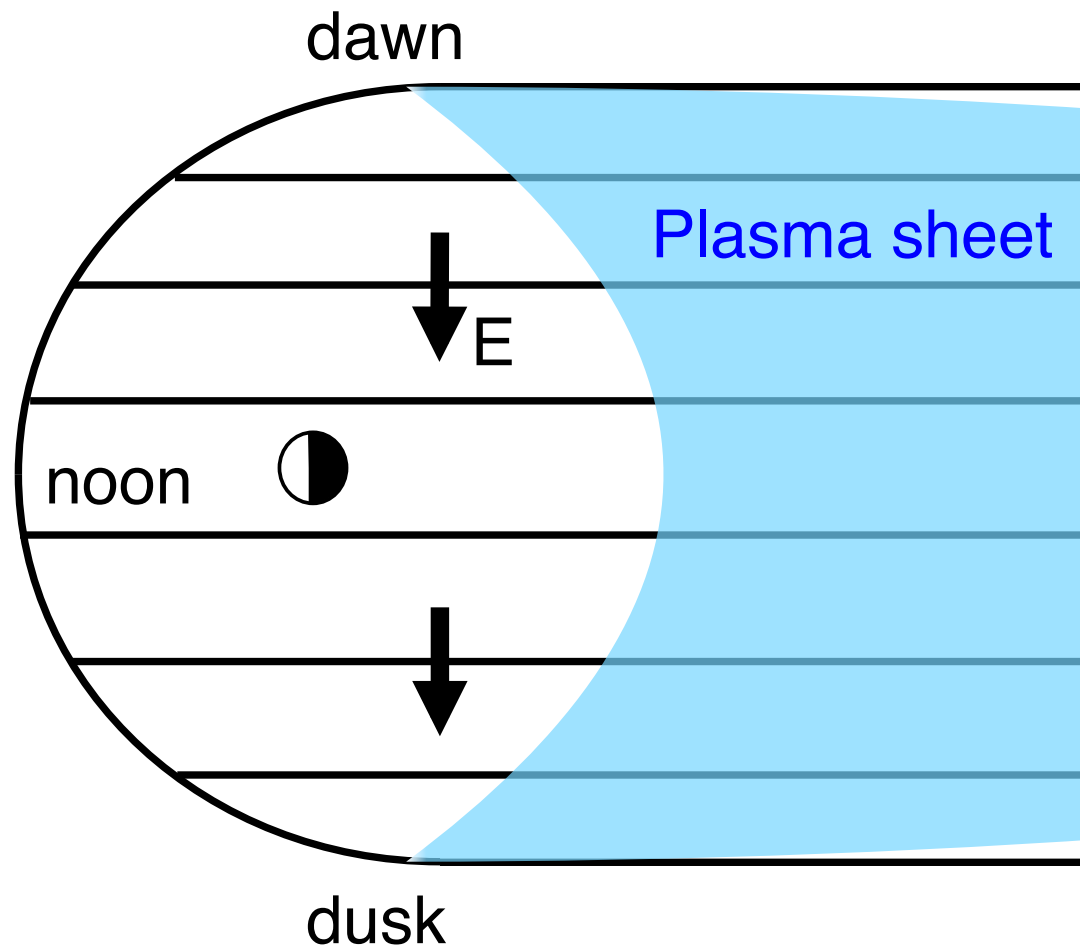
magnetosphere



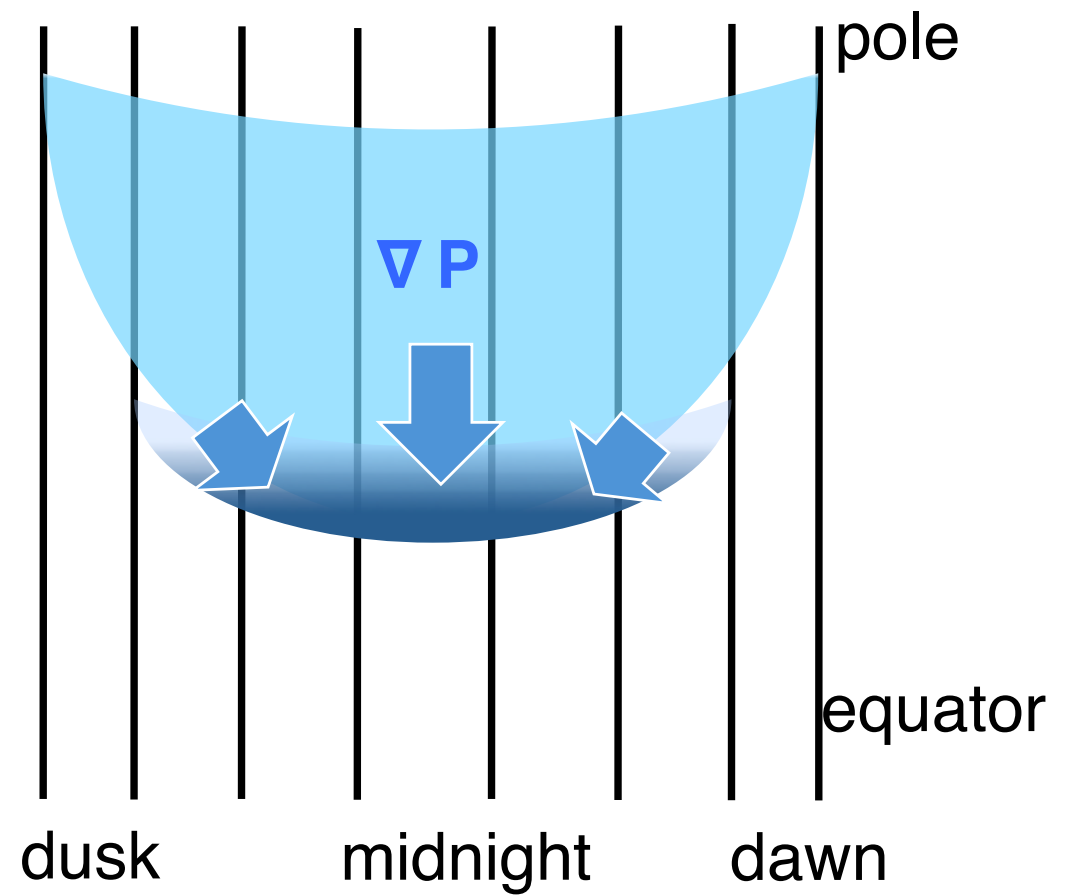
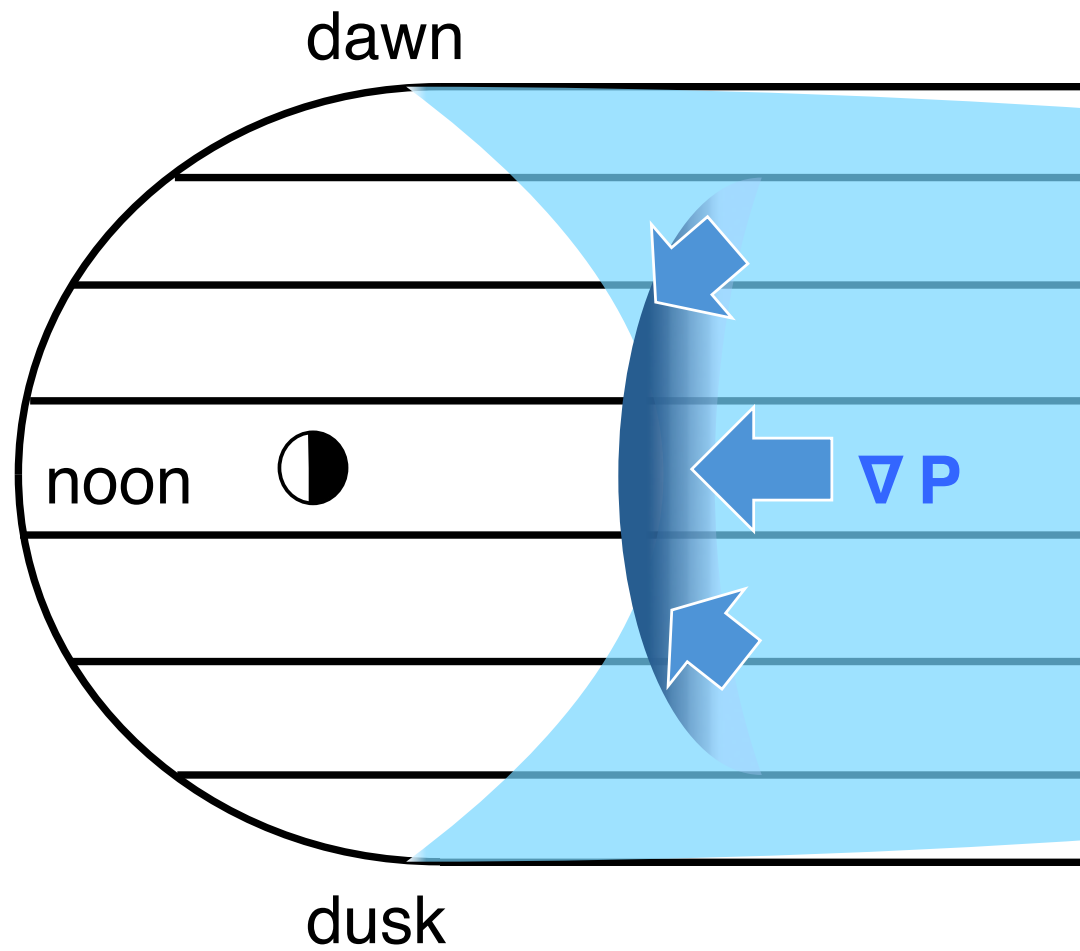
ionosphere



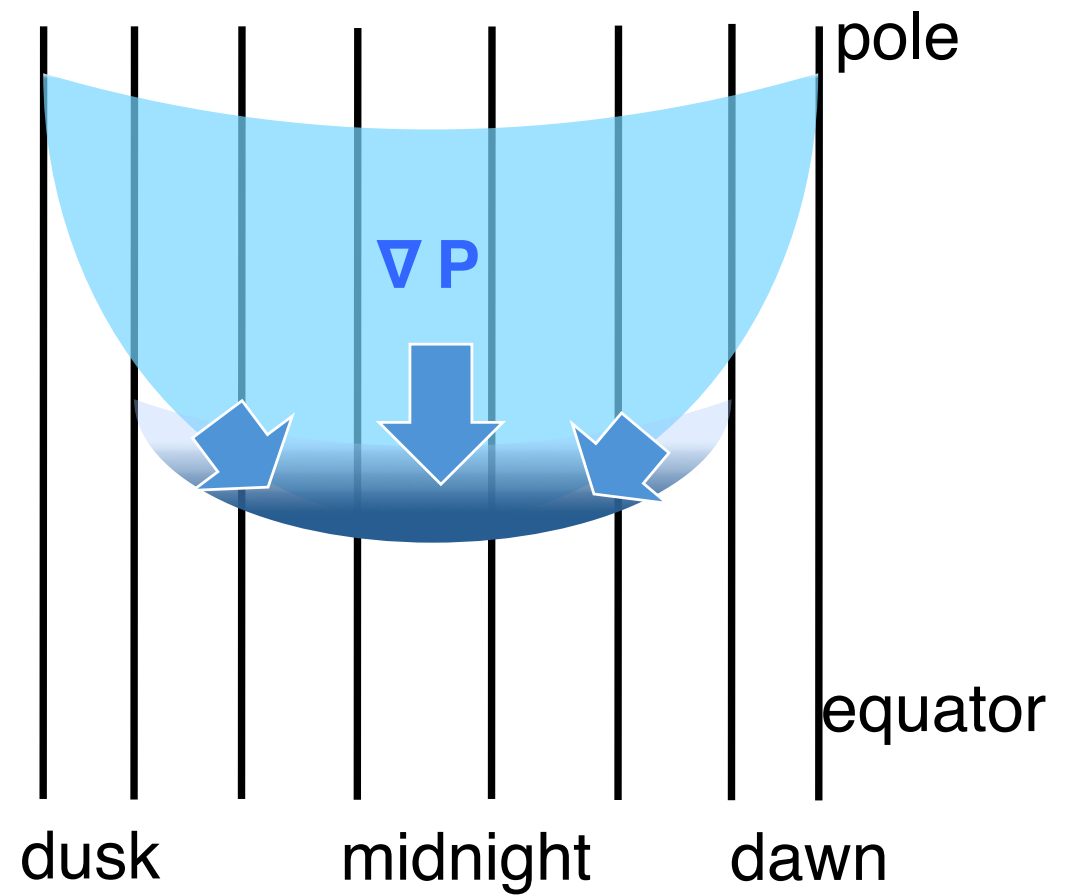
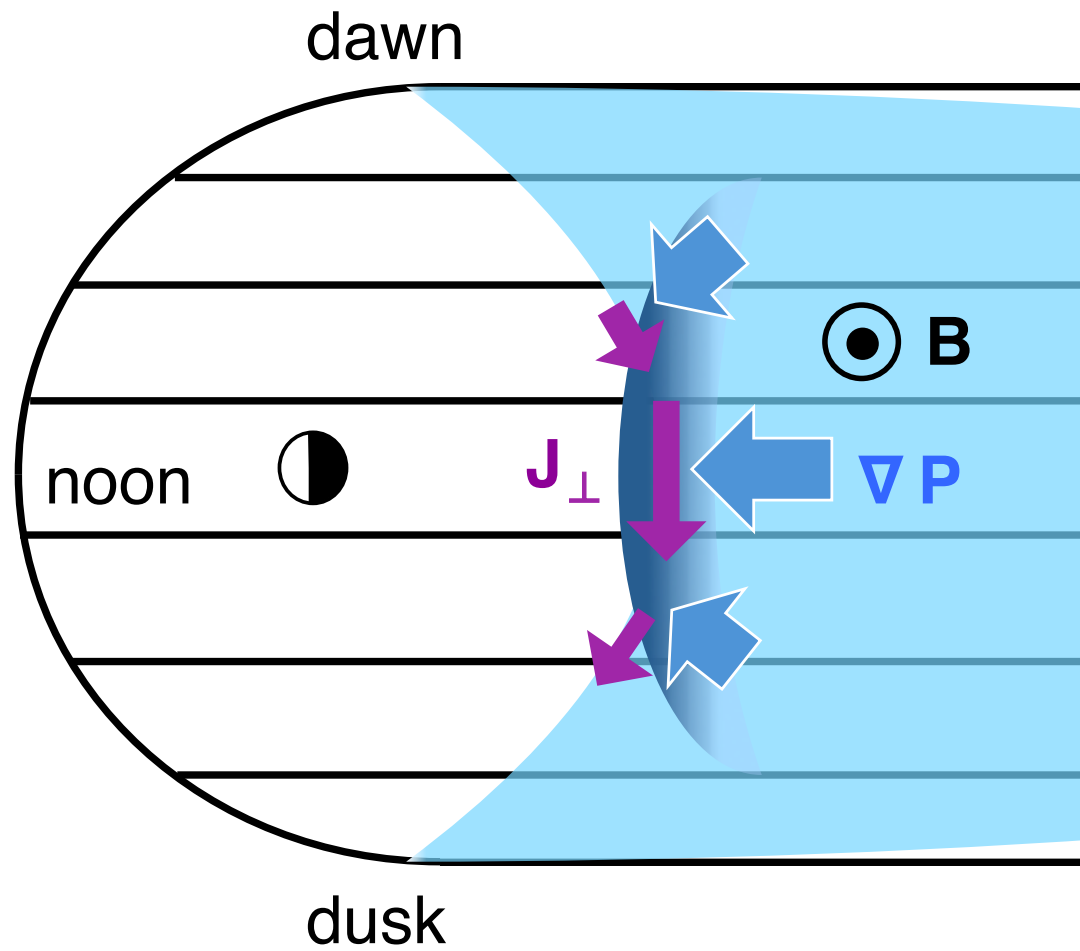
Physics of R-2 FACs



Physics of R-2 FACs

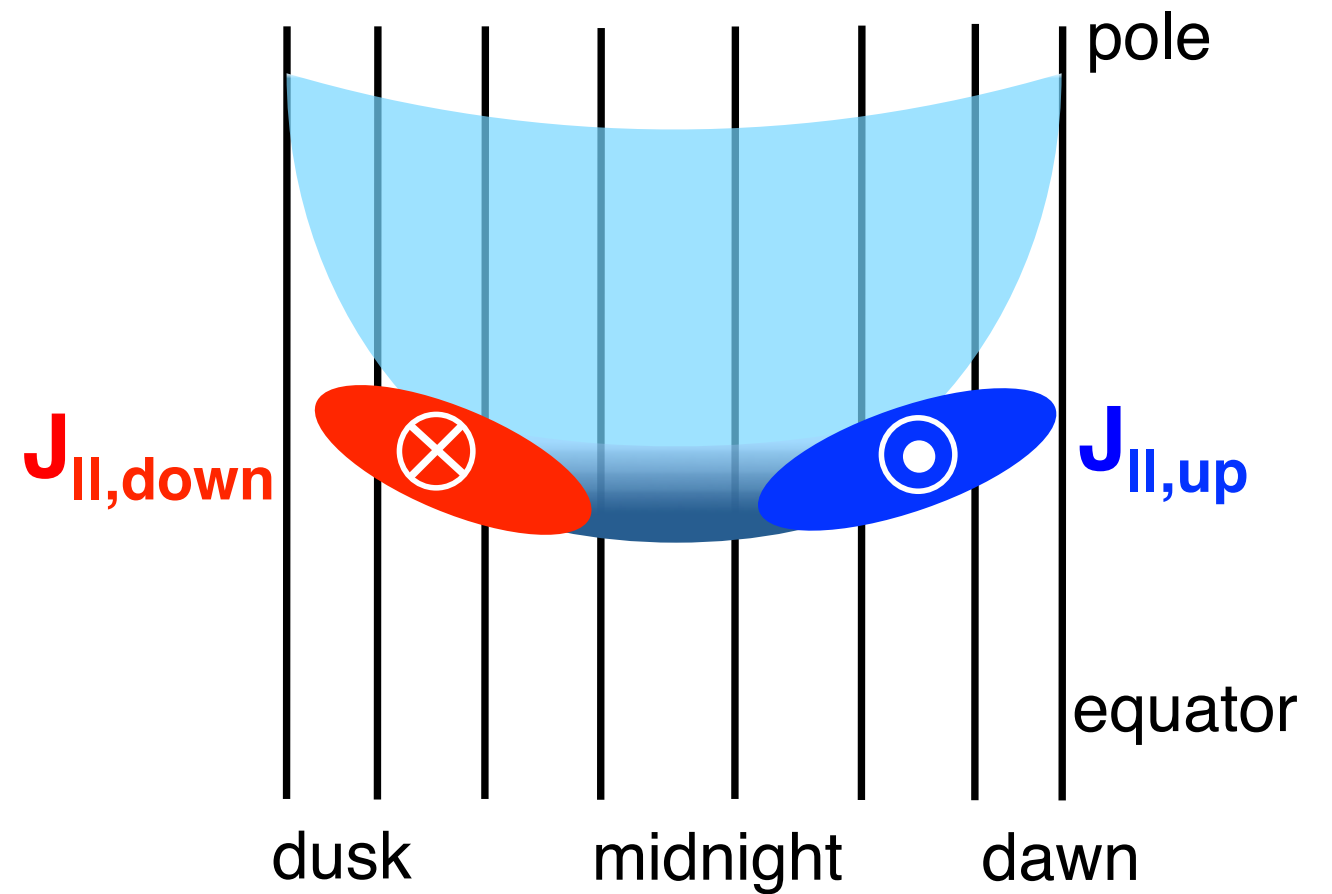
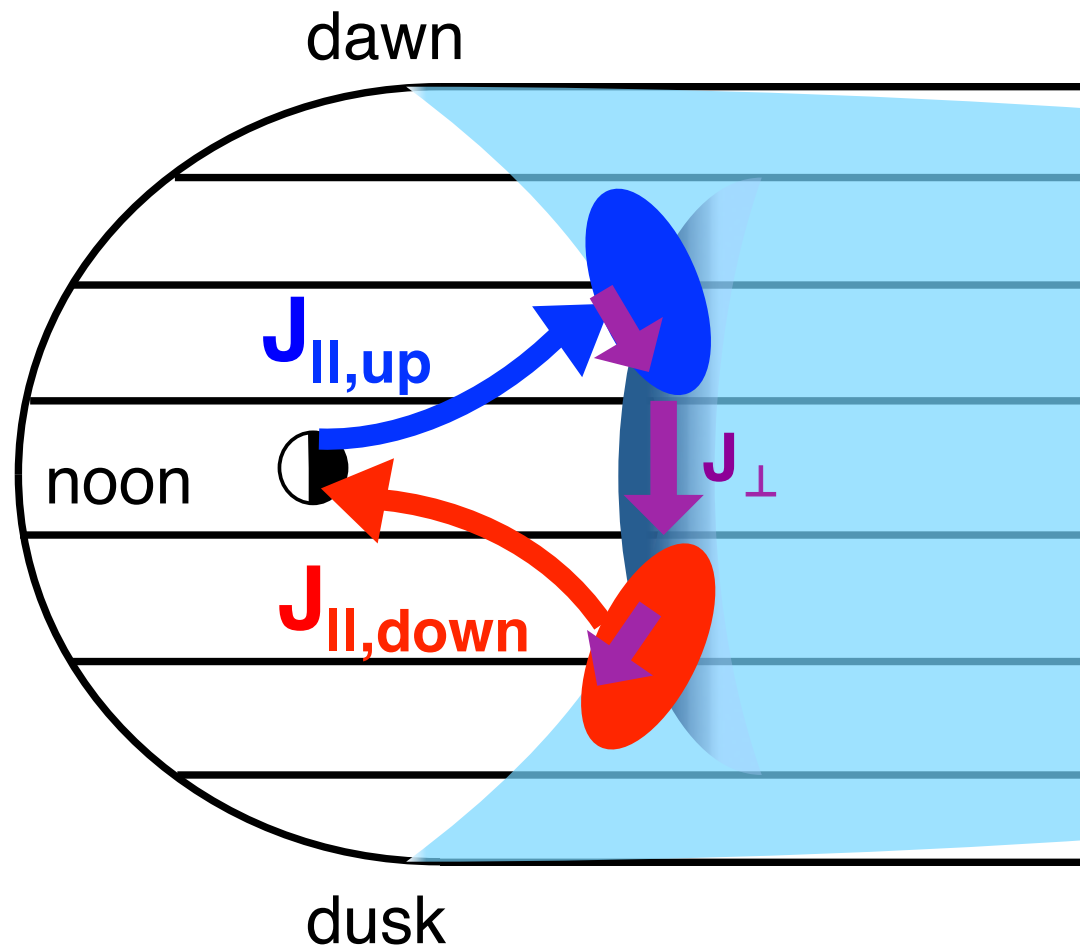


Physics of R-2 FACs



$$J_{\perp} = B \times \nabla P / B^2$$

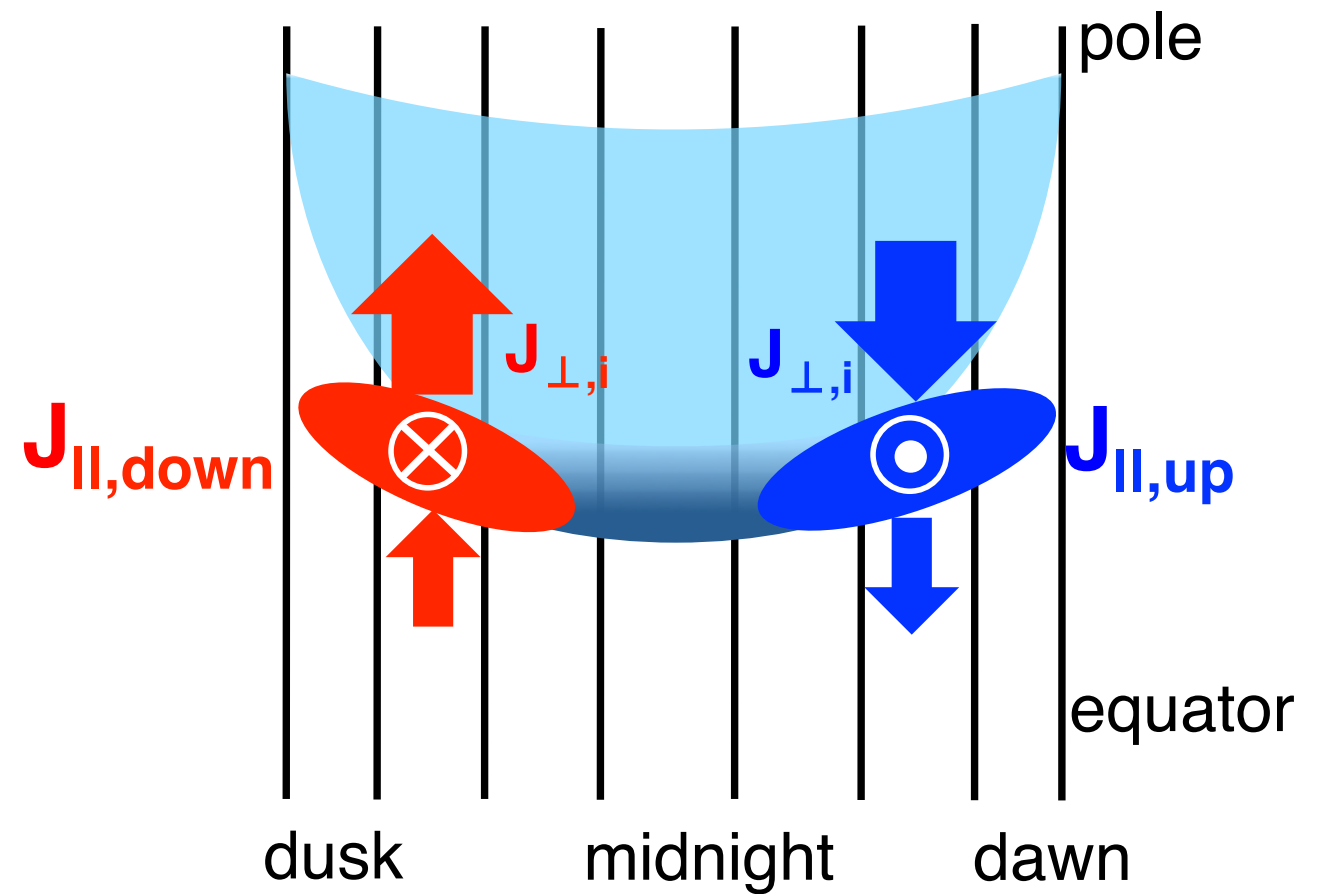
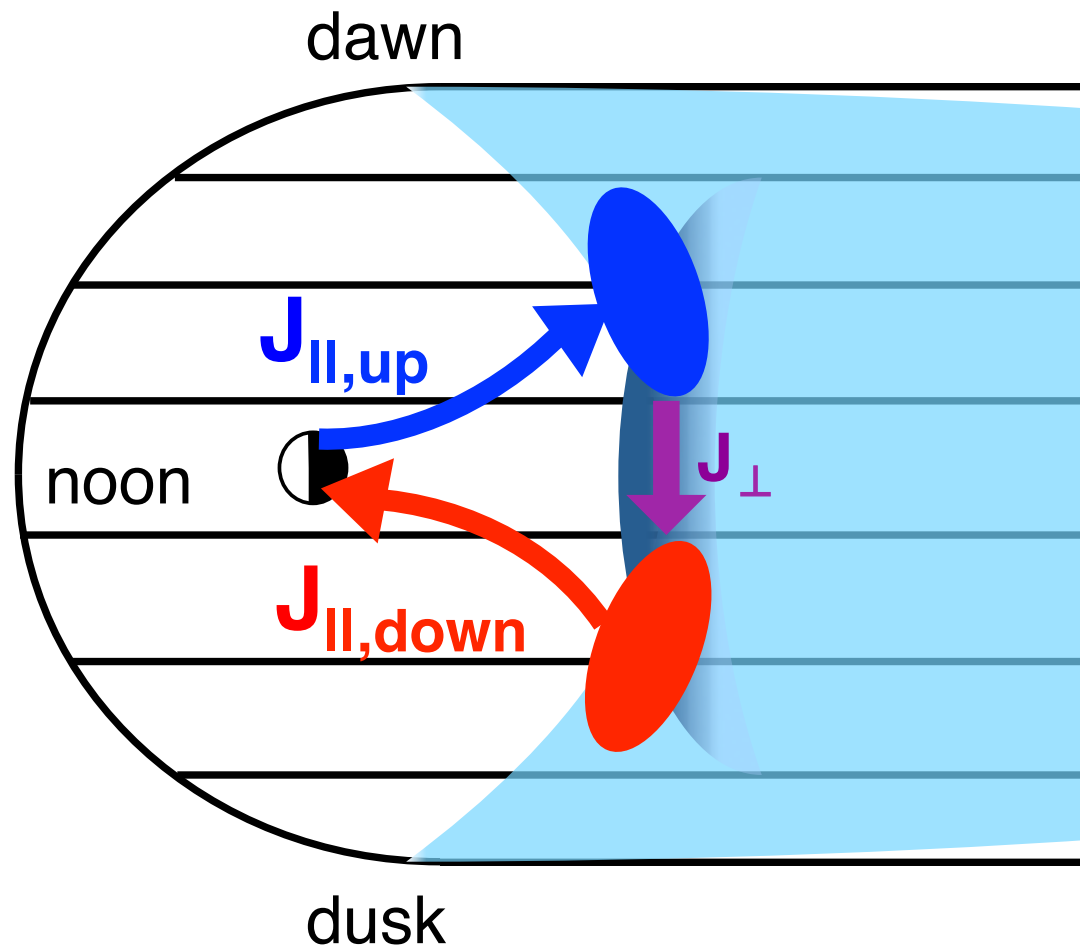
Physics of R-2 FACs



$$\nabla \cdot \mathbf{J} = 0$$

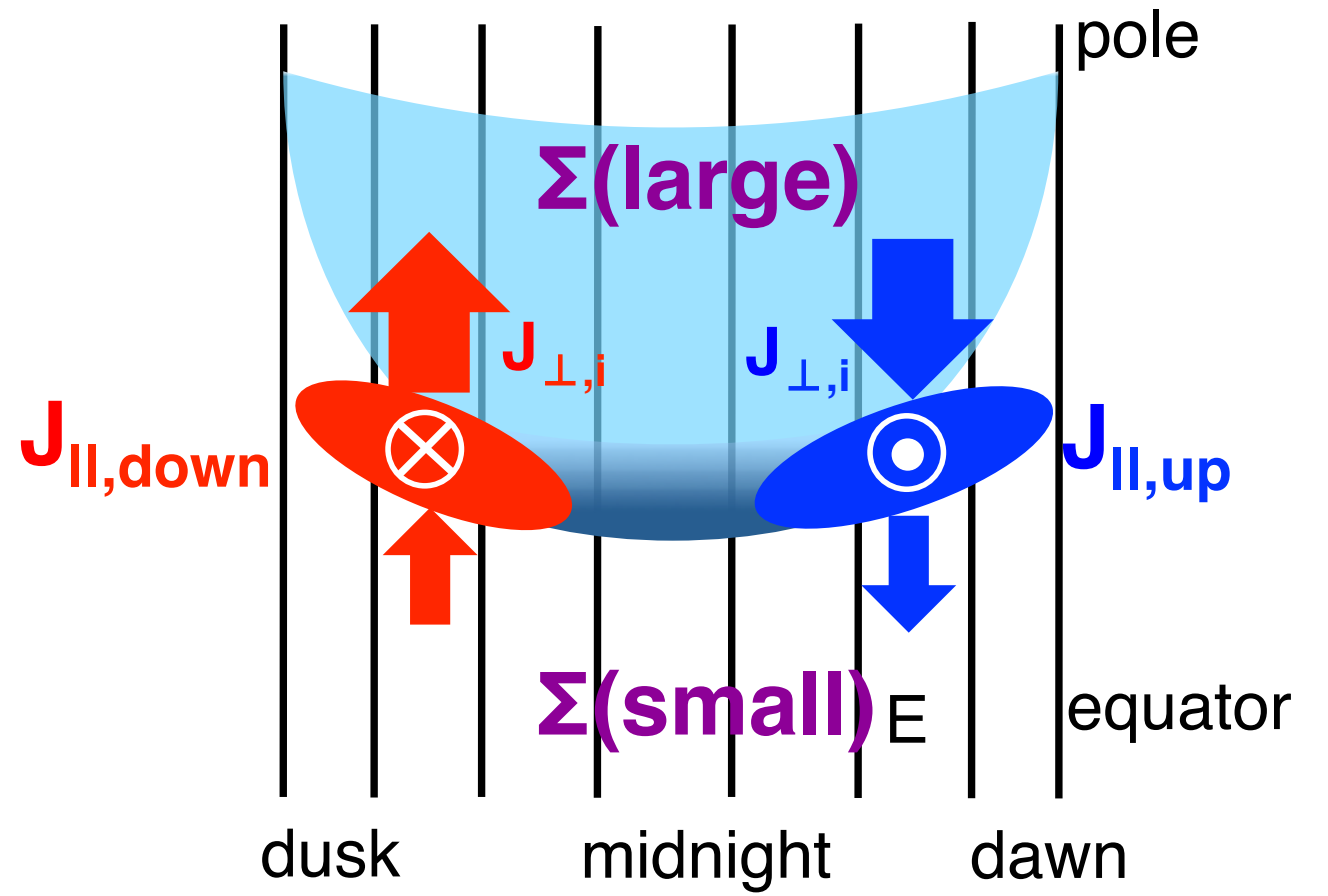
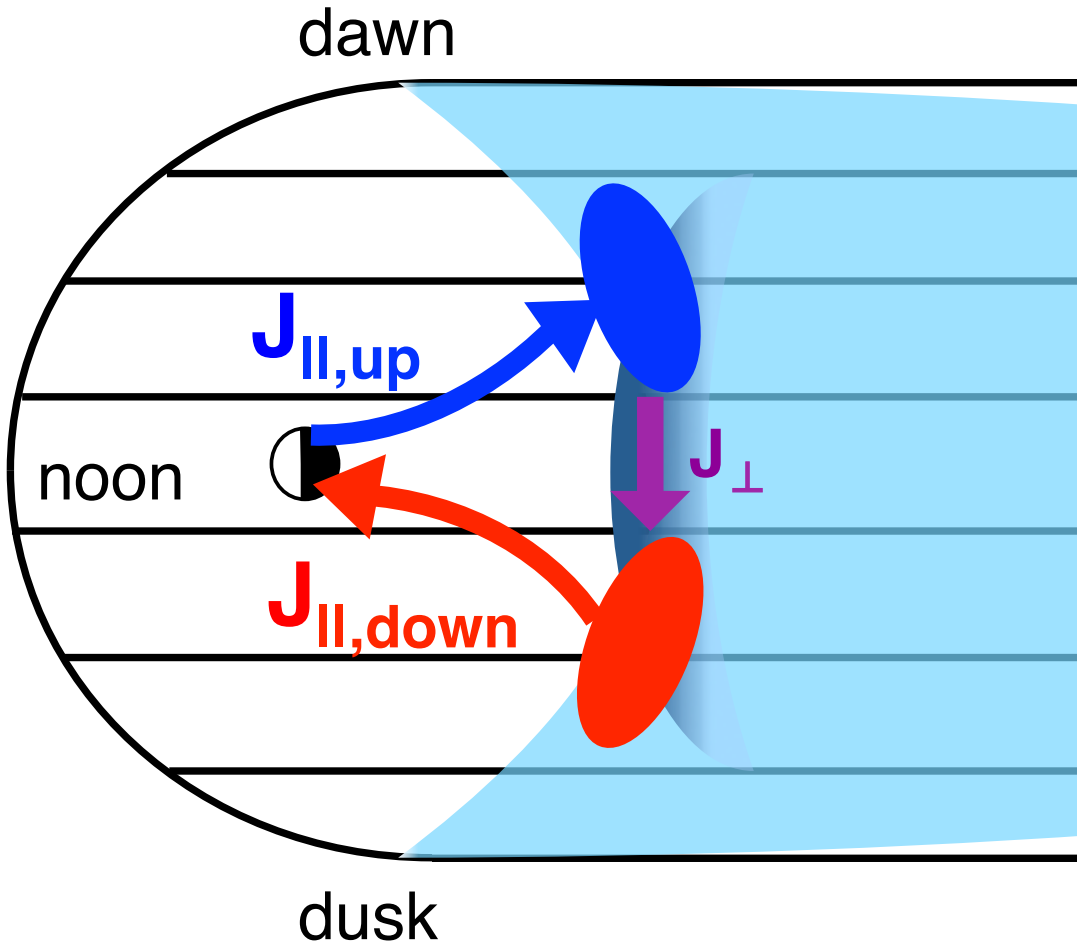
$$\nabla_{\perp} \cdot \mathbf{J}_{\perp} + \nabla_{II} \cdot \mathbf{J}_{II} = 0$$

Physics of shielding



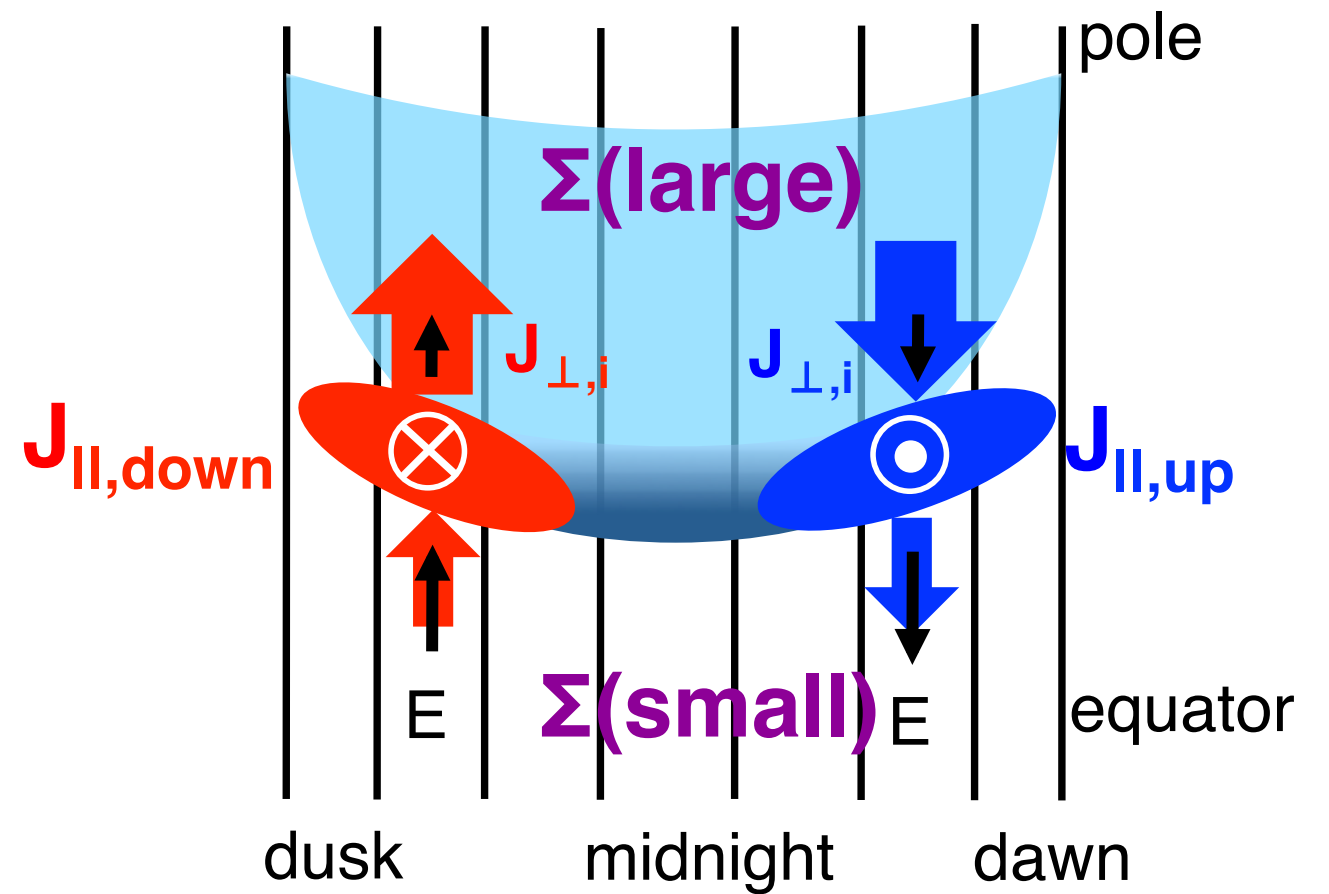
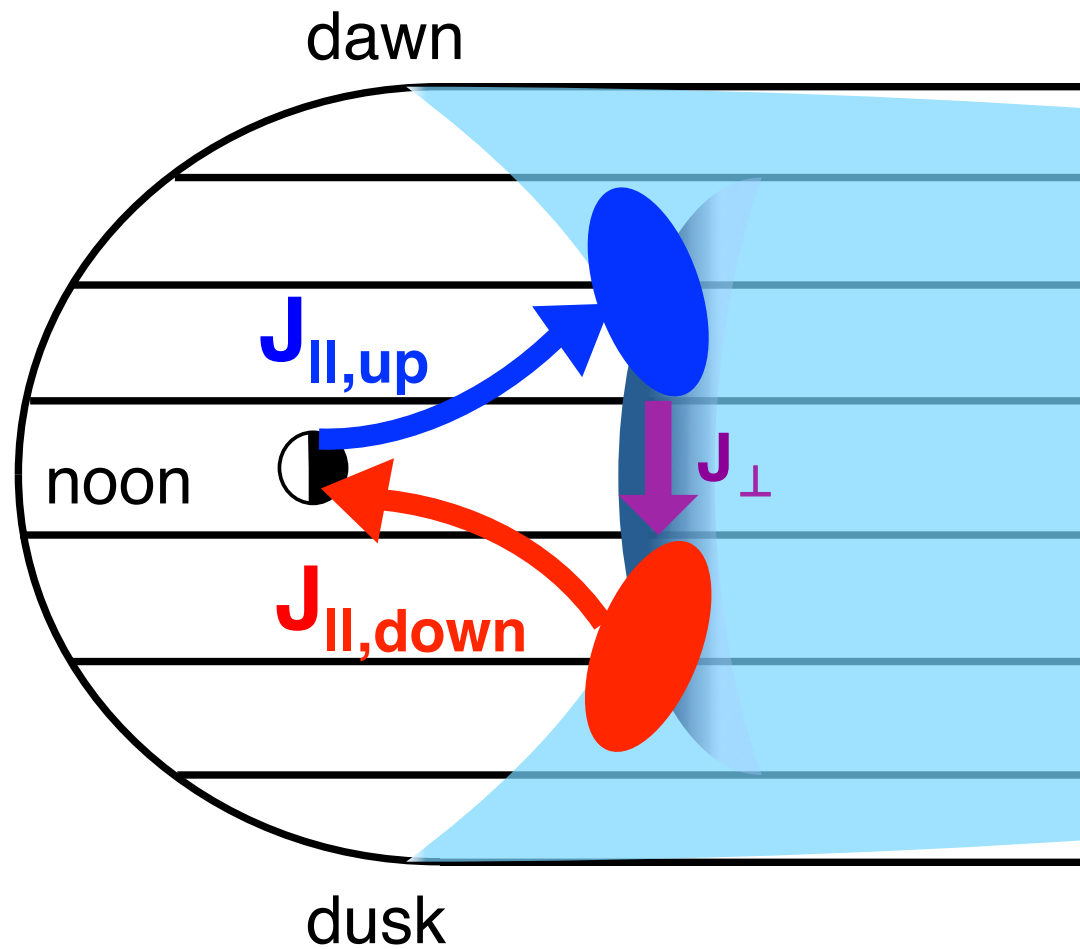
$$\nabla_{II} \cdot J_{II} + \nabla_{\perp,i} \cdot J_{\perp,i} = 0$$

Physics of shielding



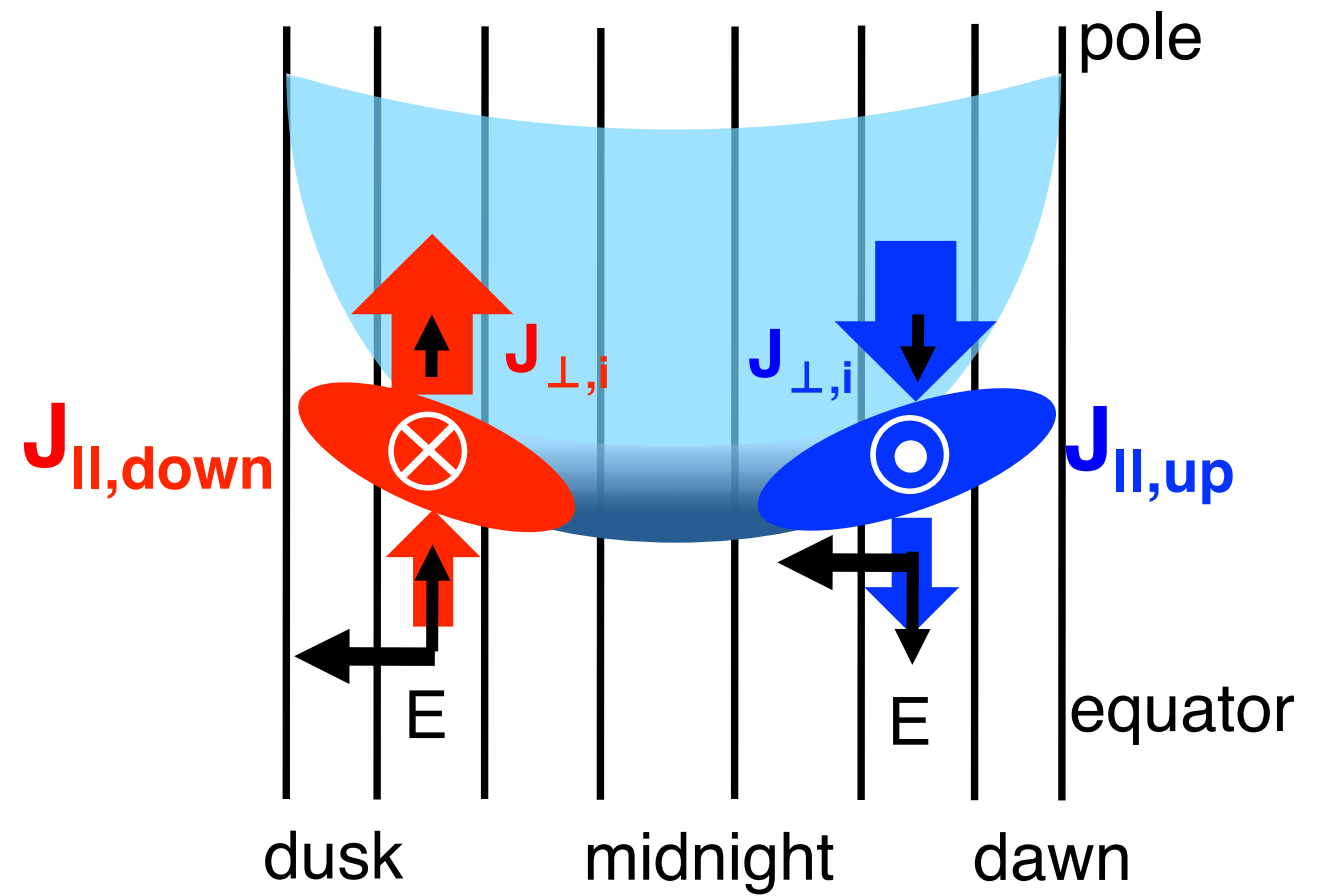
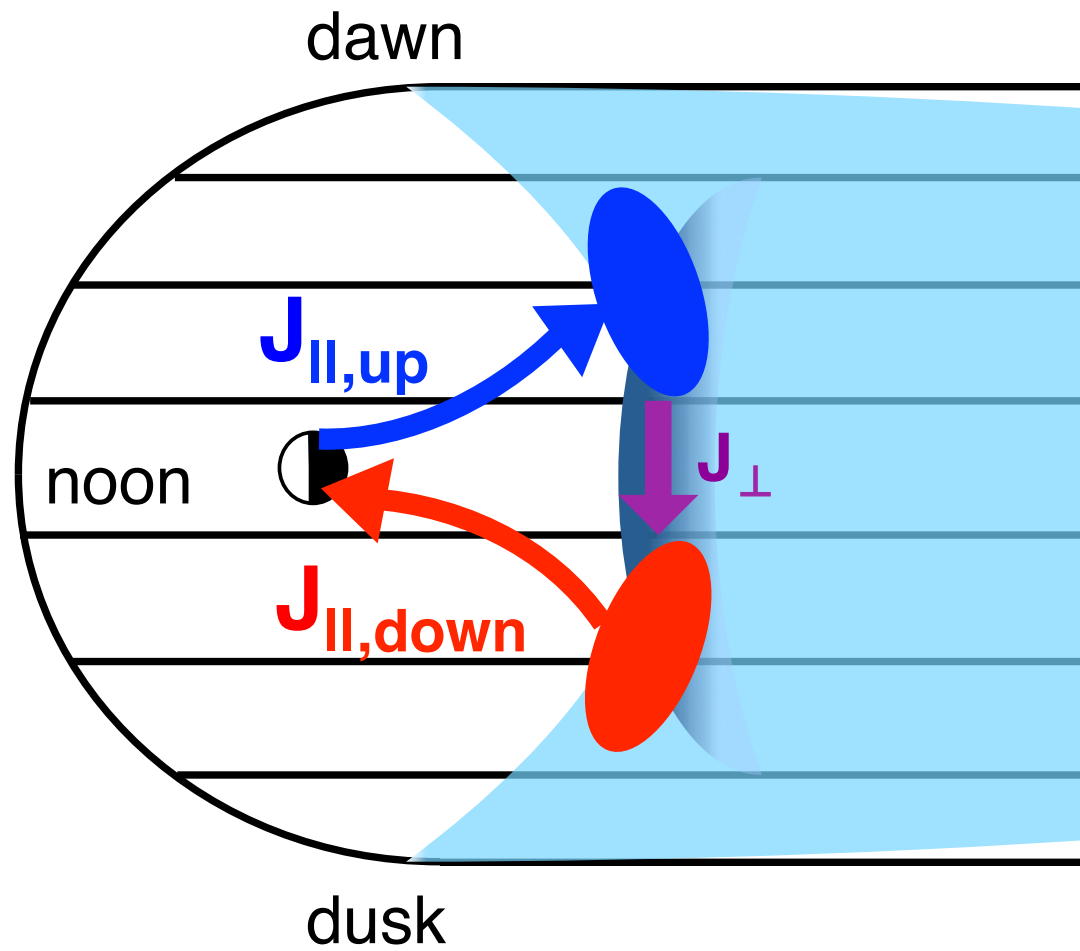
$$\mathbf{J}_{\perp,i} = \Sigma \mathbf{E}$$

Physics of shielding

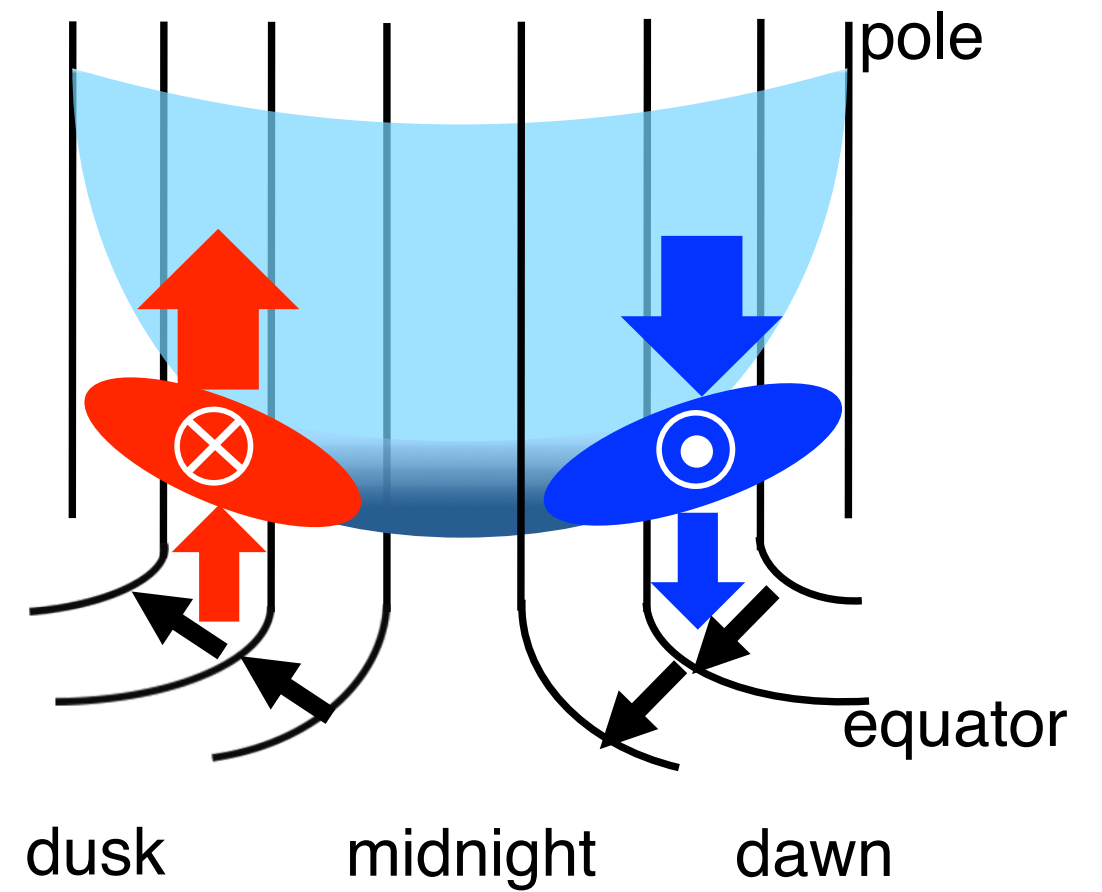
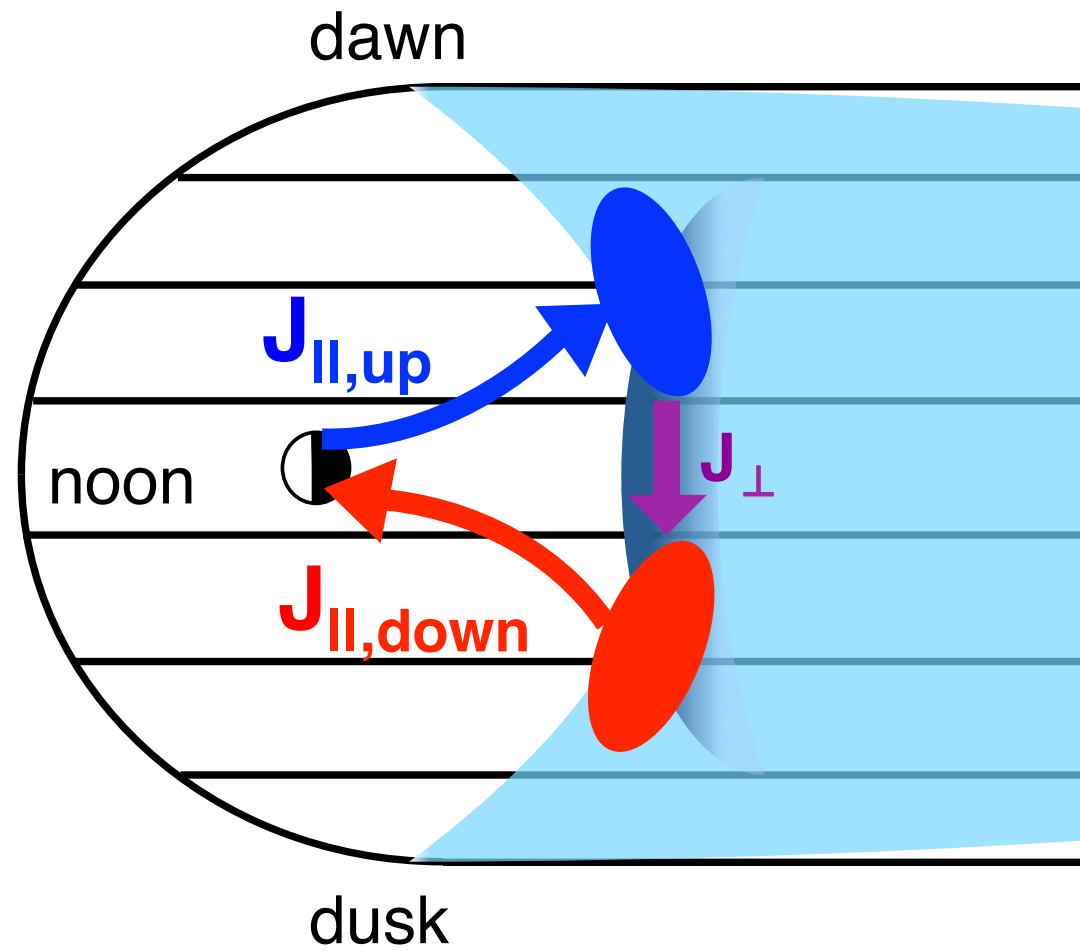


$$\nabla_{\perp,i} \cdot \mathbf{J}_{\perp,i} = \nabla_{\perp,i} \cdot (\Sigma \mathbf{E})$$

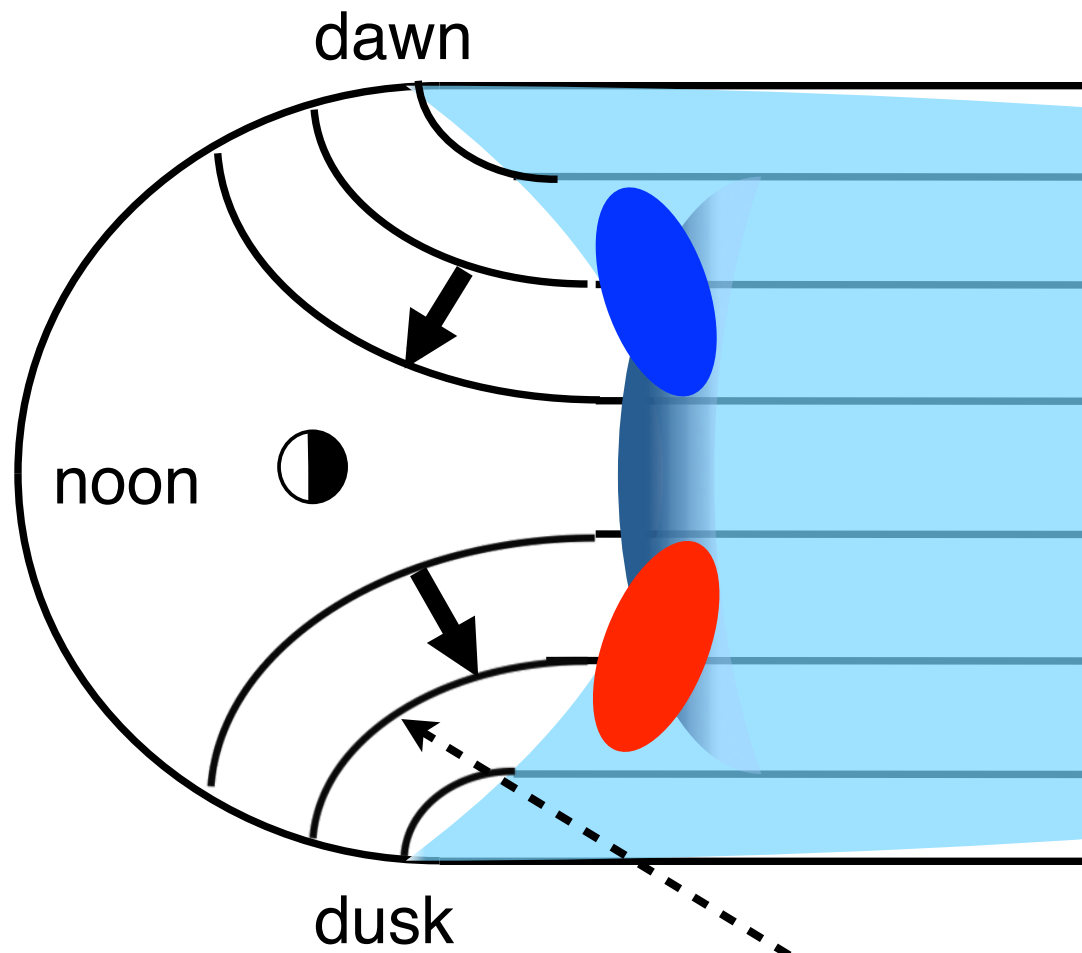
Physics of shielding



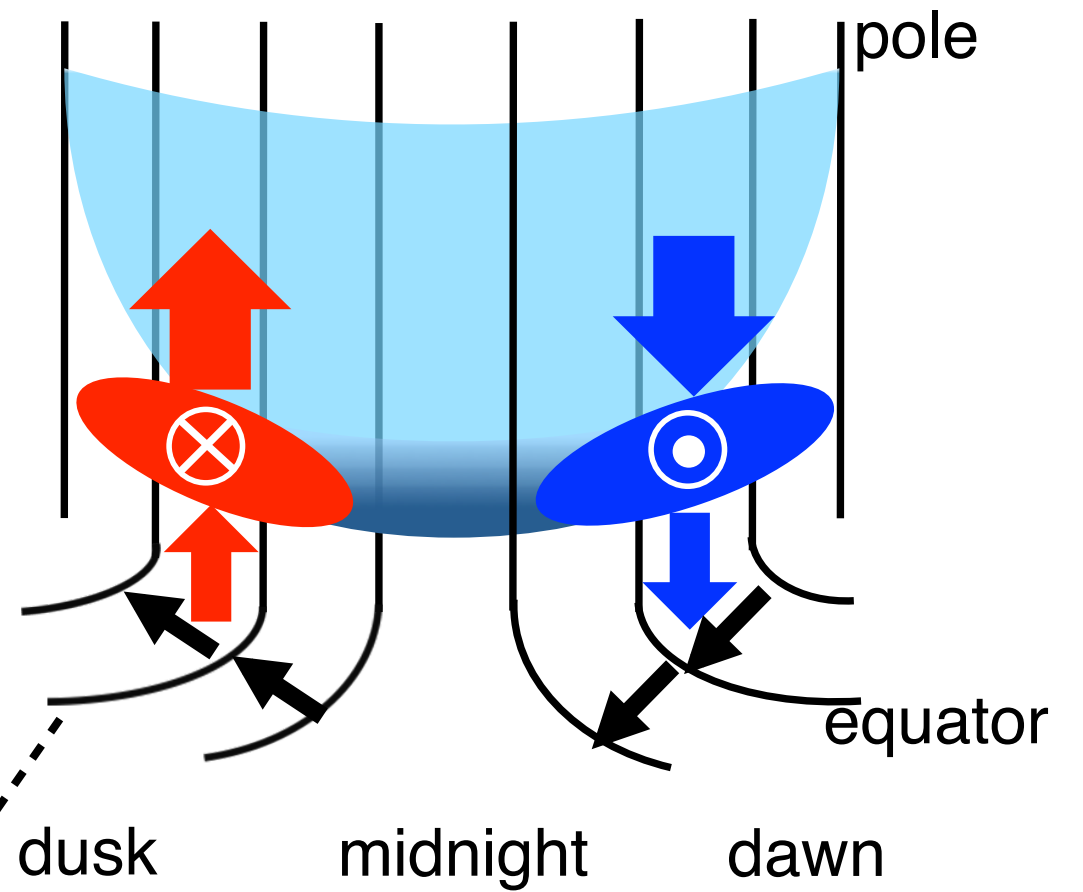
Physics of shielding



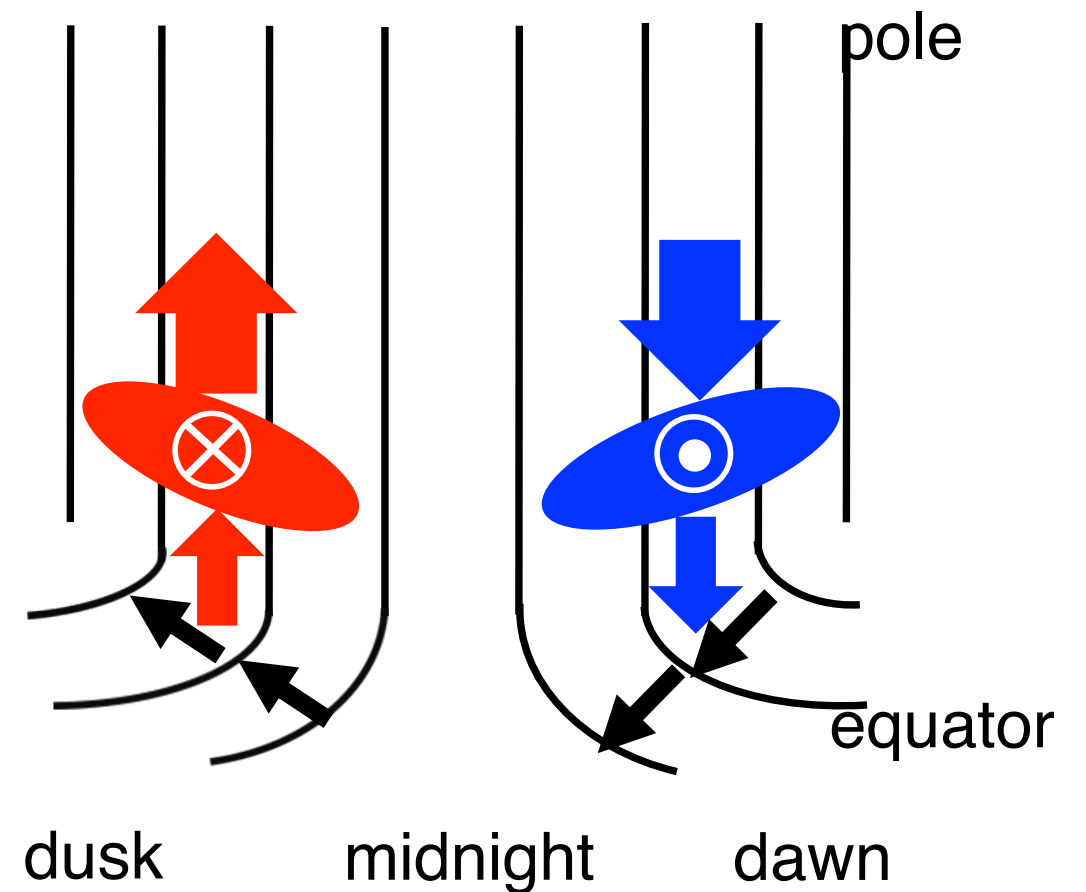
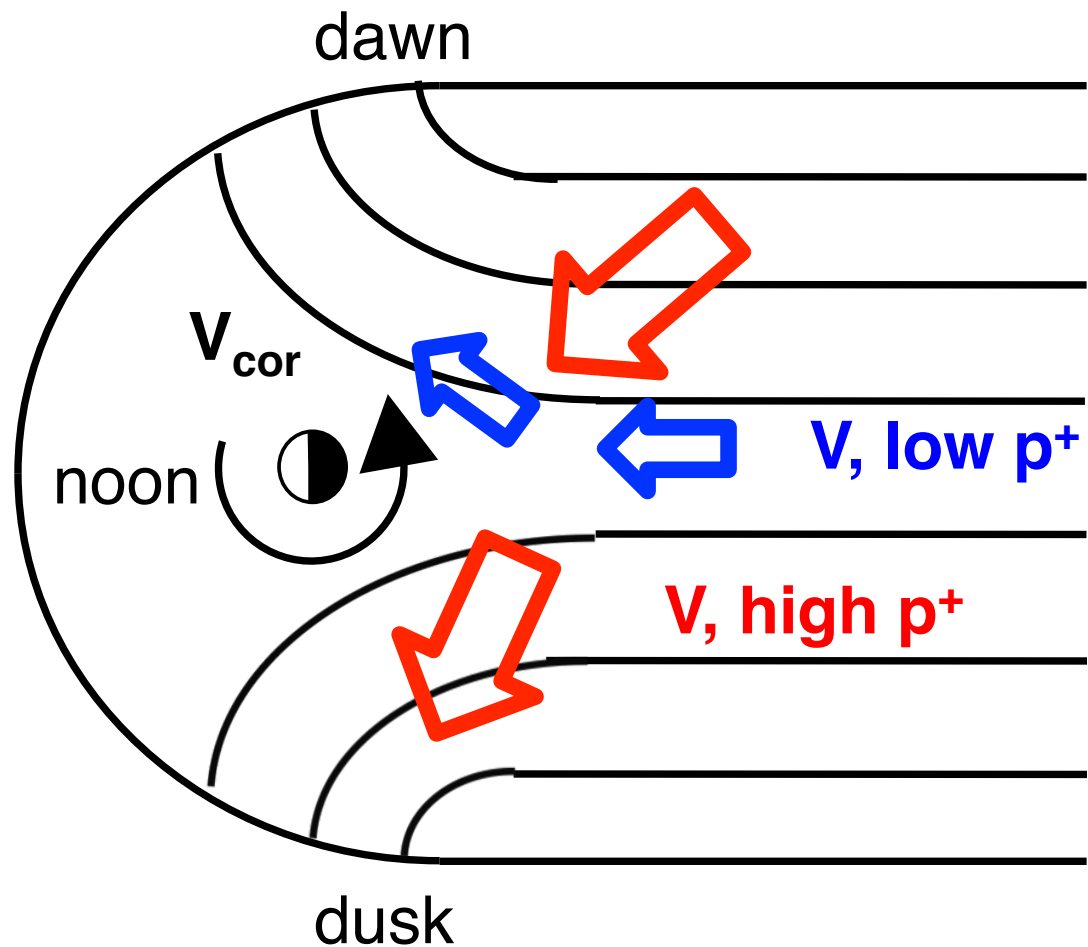
Physics of shielding



$$E_{||} = 0$$

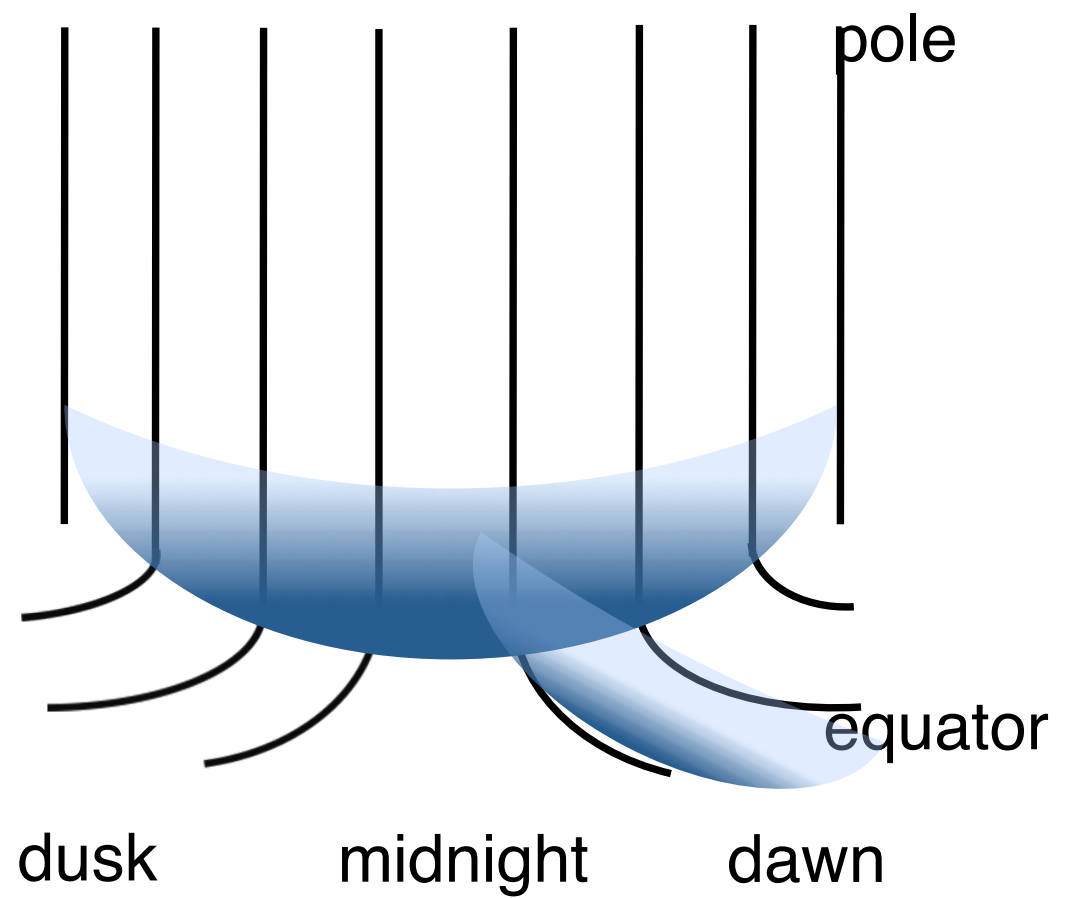
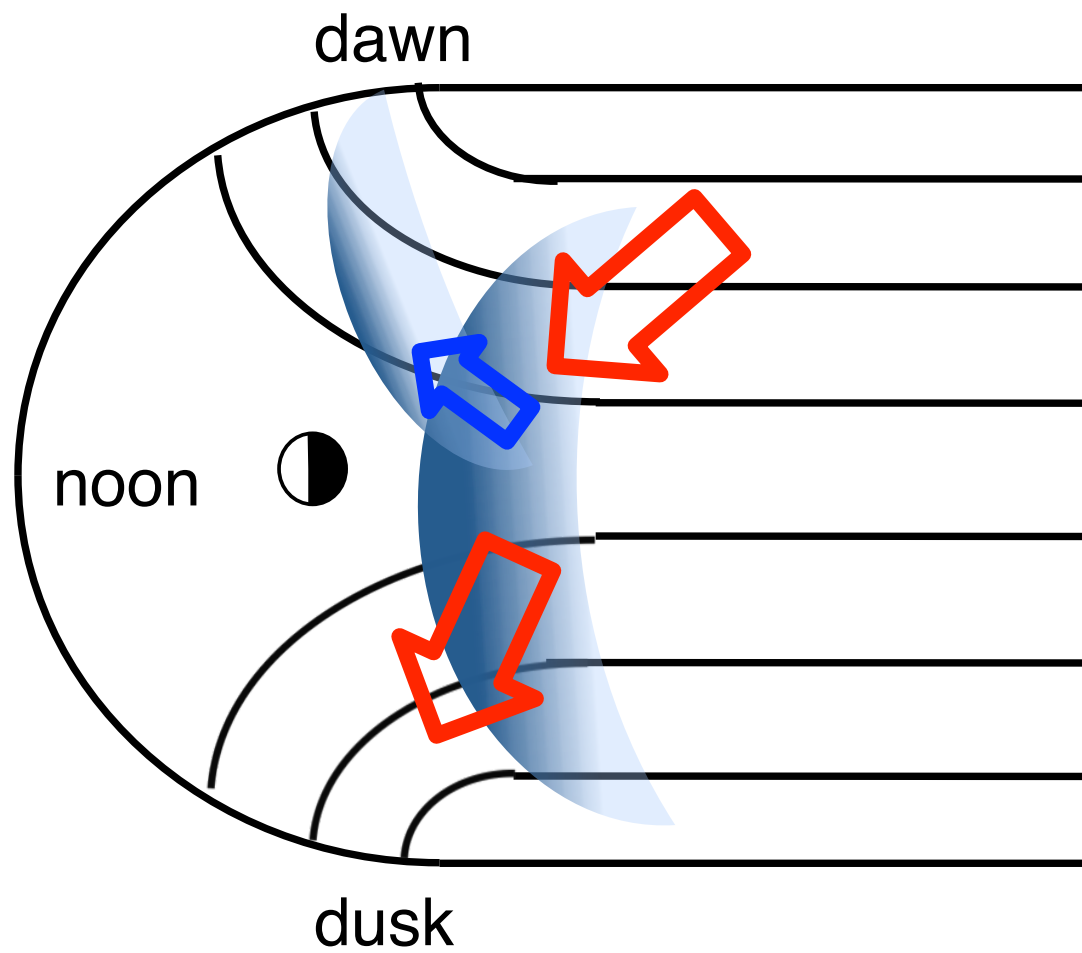


Physics of Harang reversal

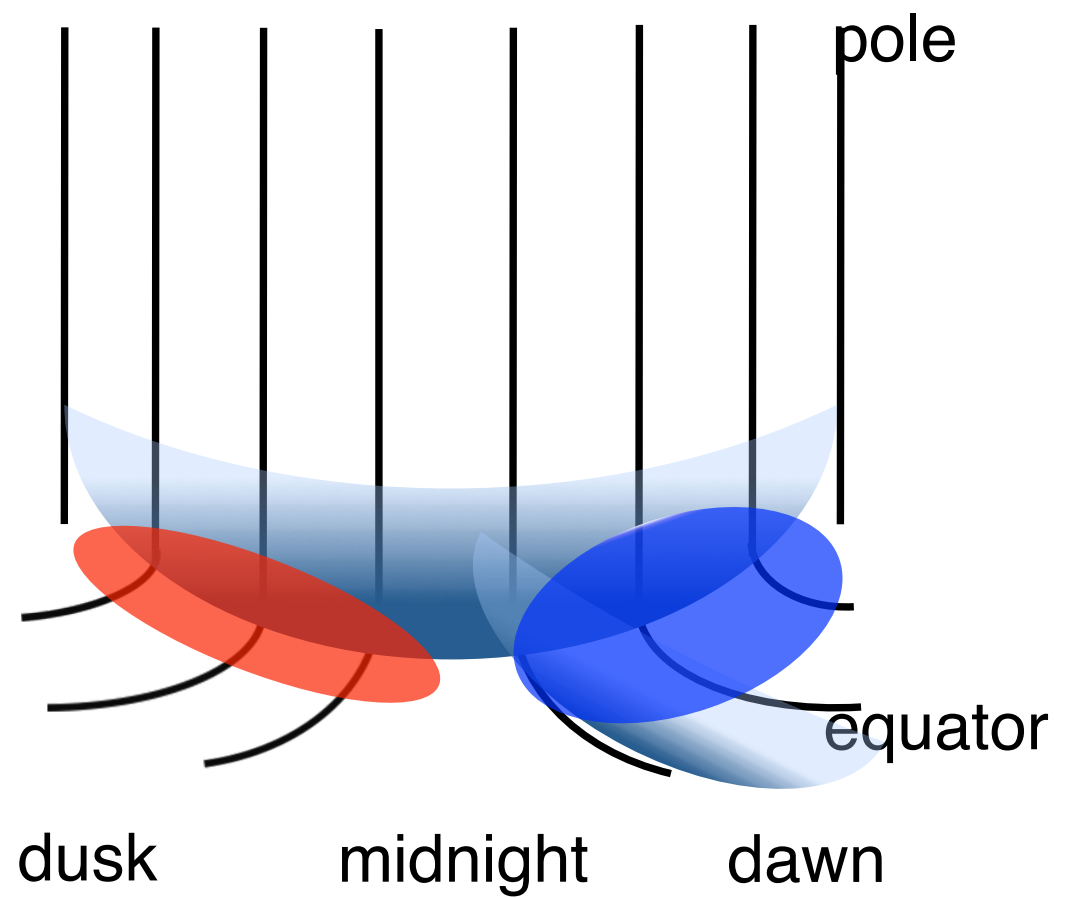
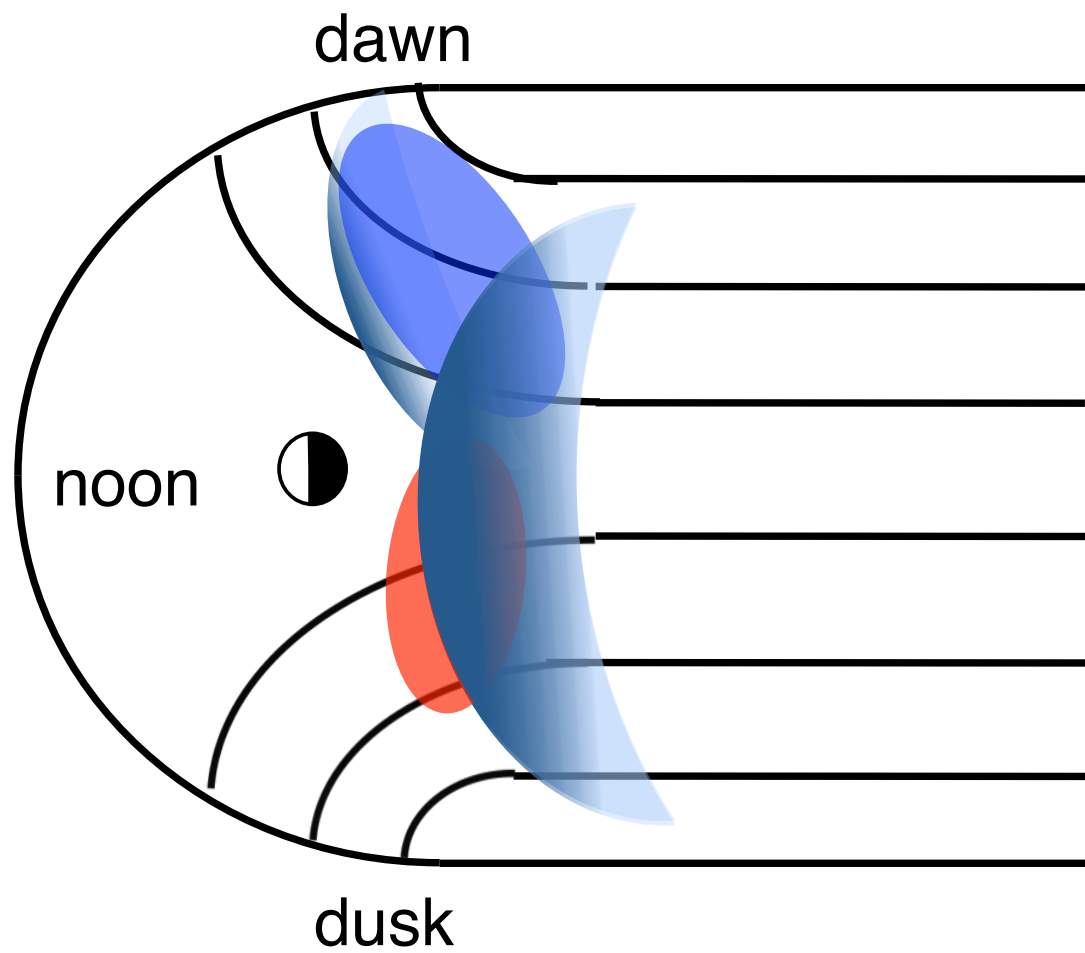


different dawn-dusk asymmetries
for low and high-energy protons
due to corotation electric drift and
magnetic drift

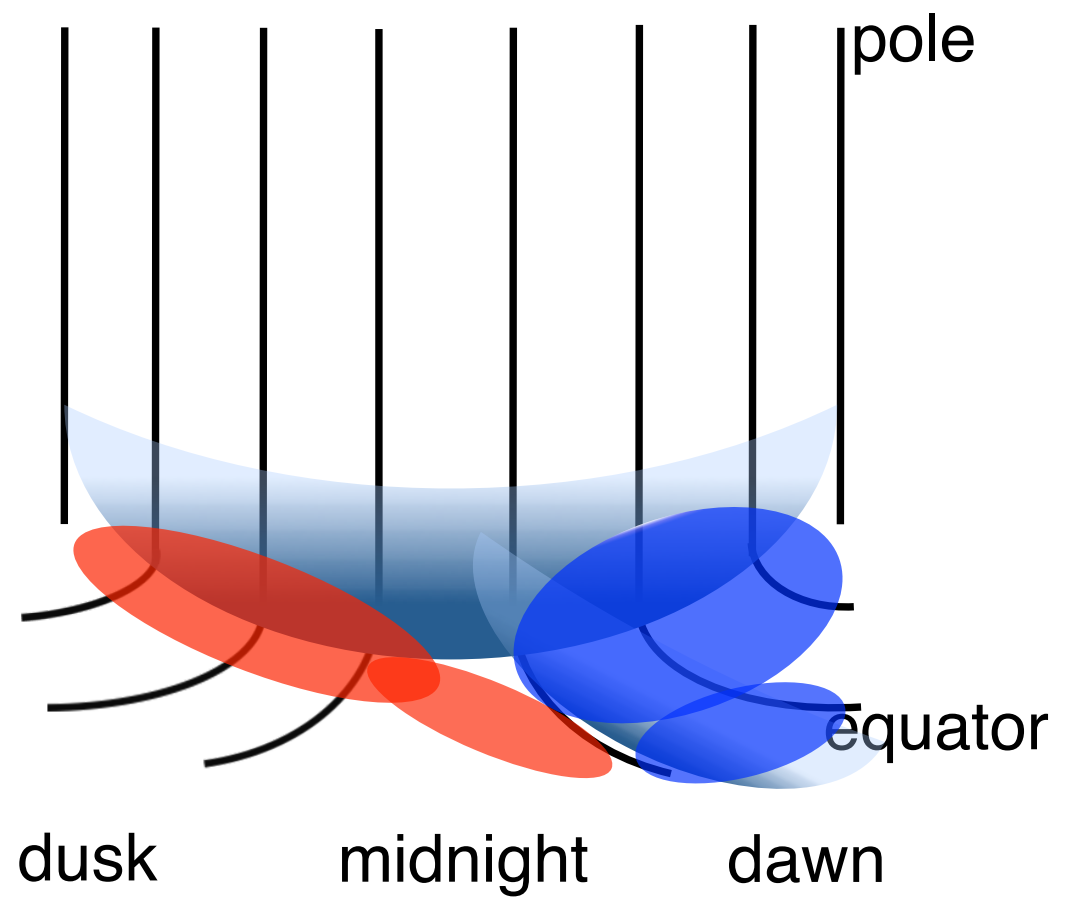
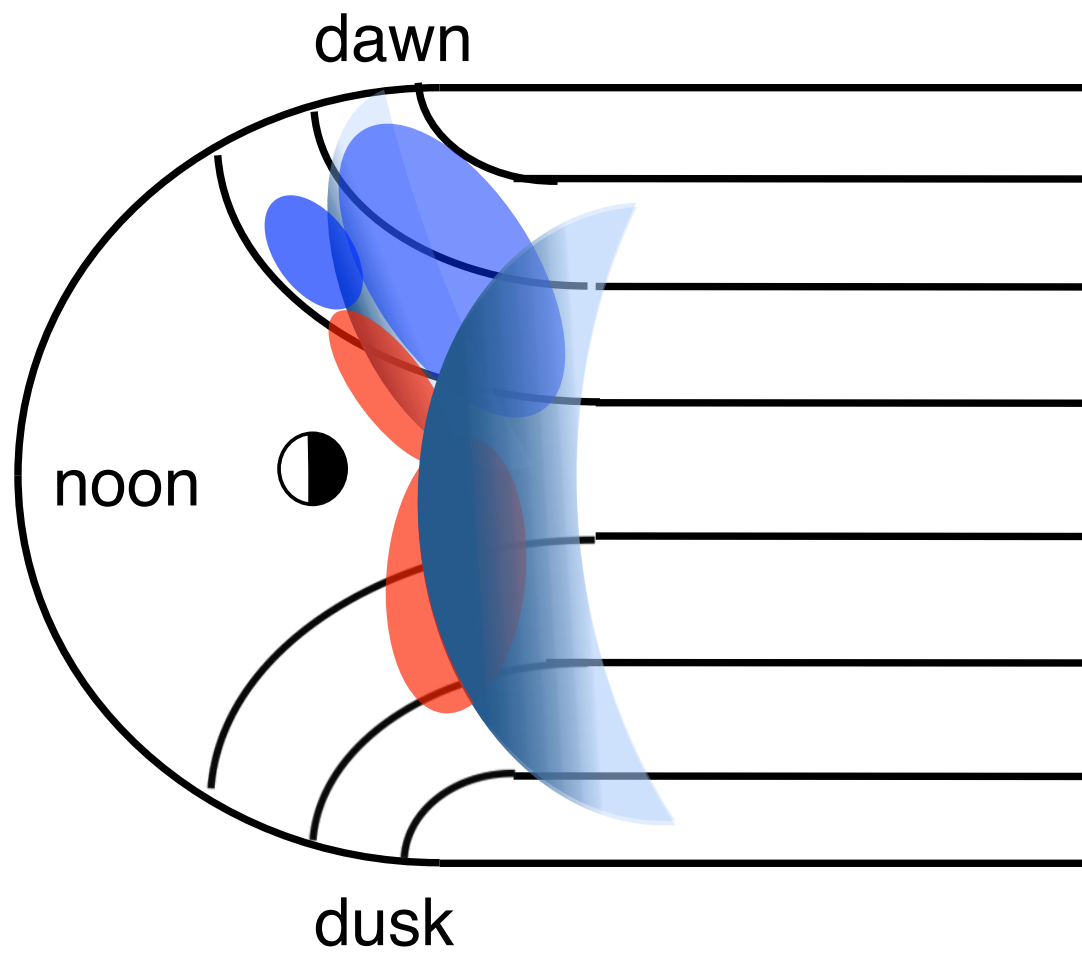
Physics of Harang reversal



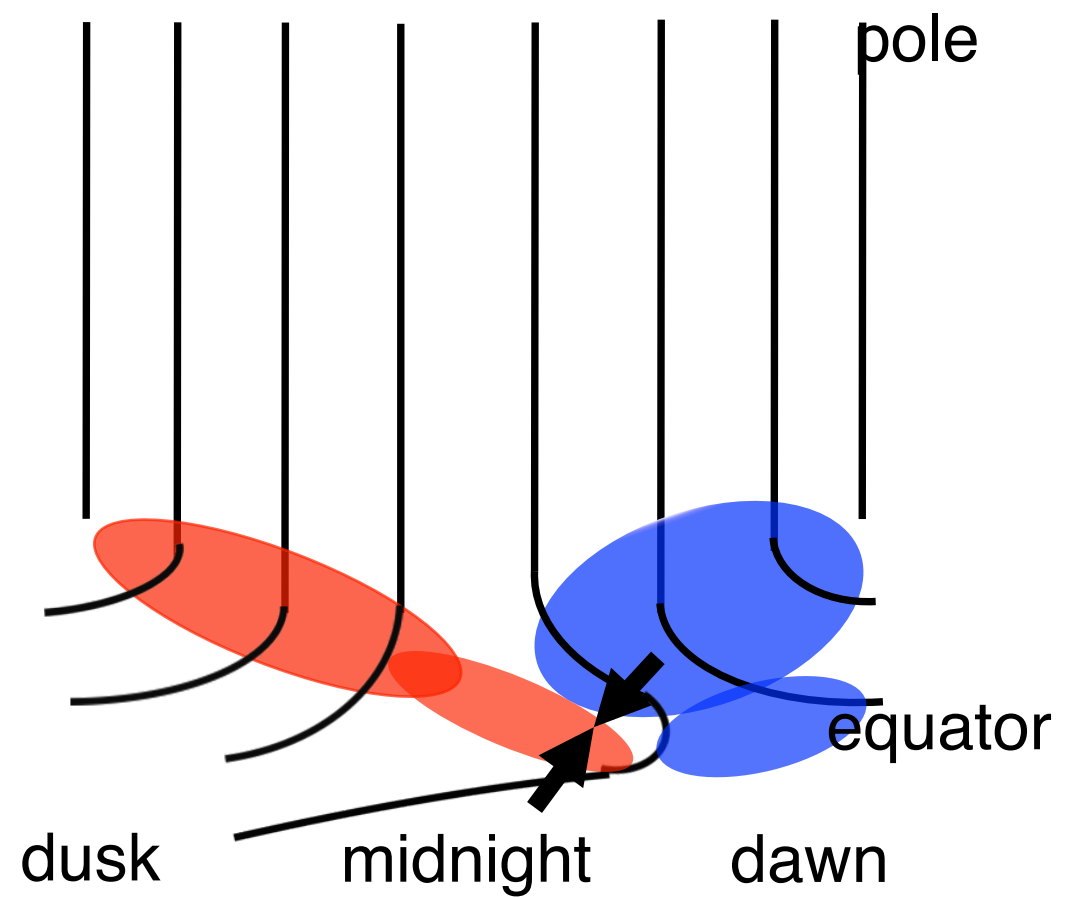
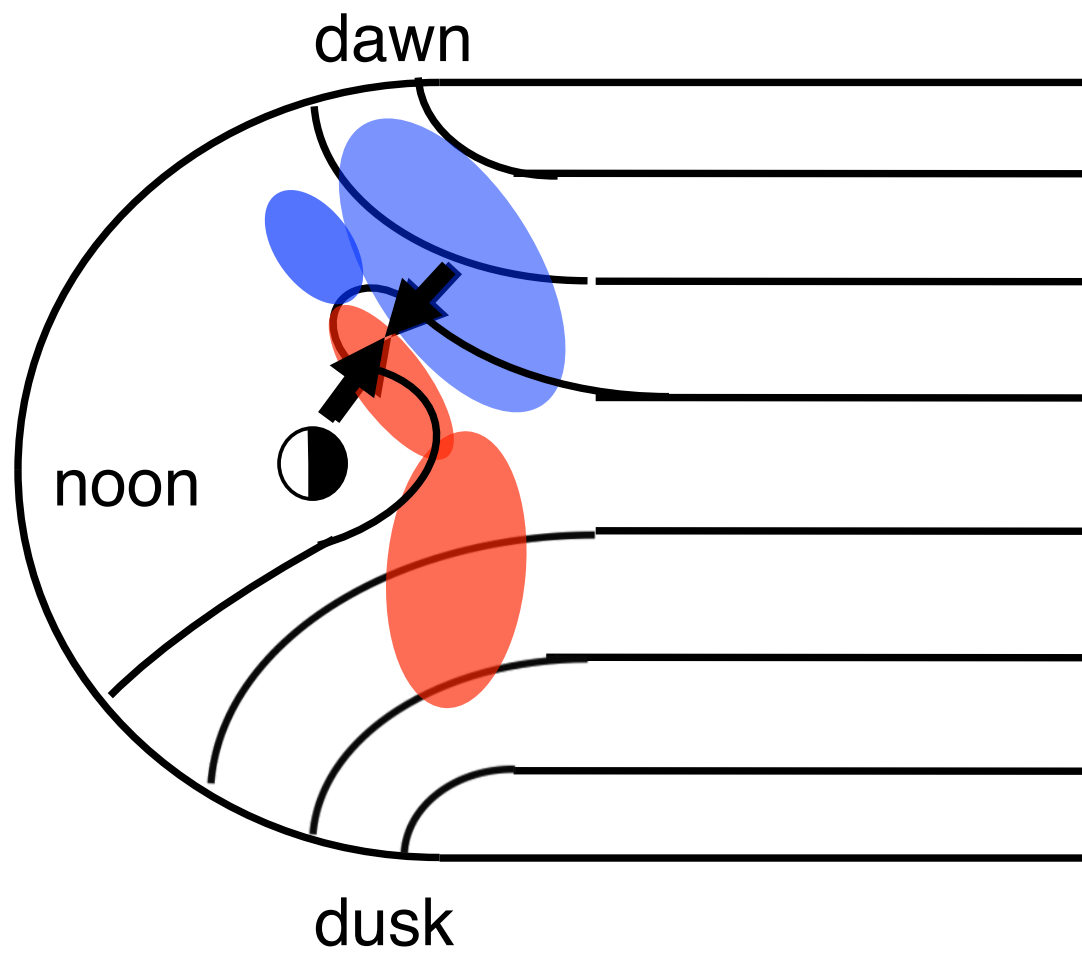
Physics of Harang reversal



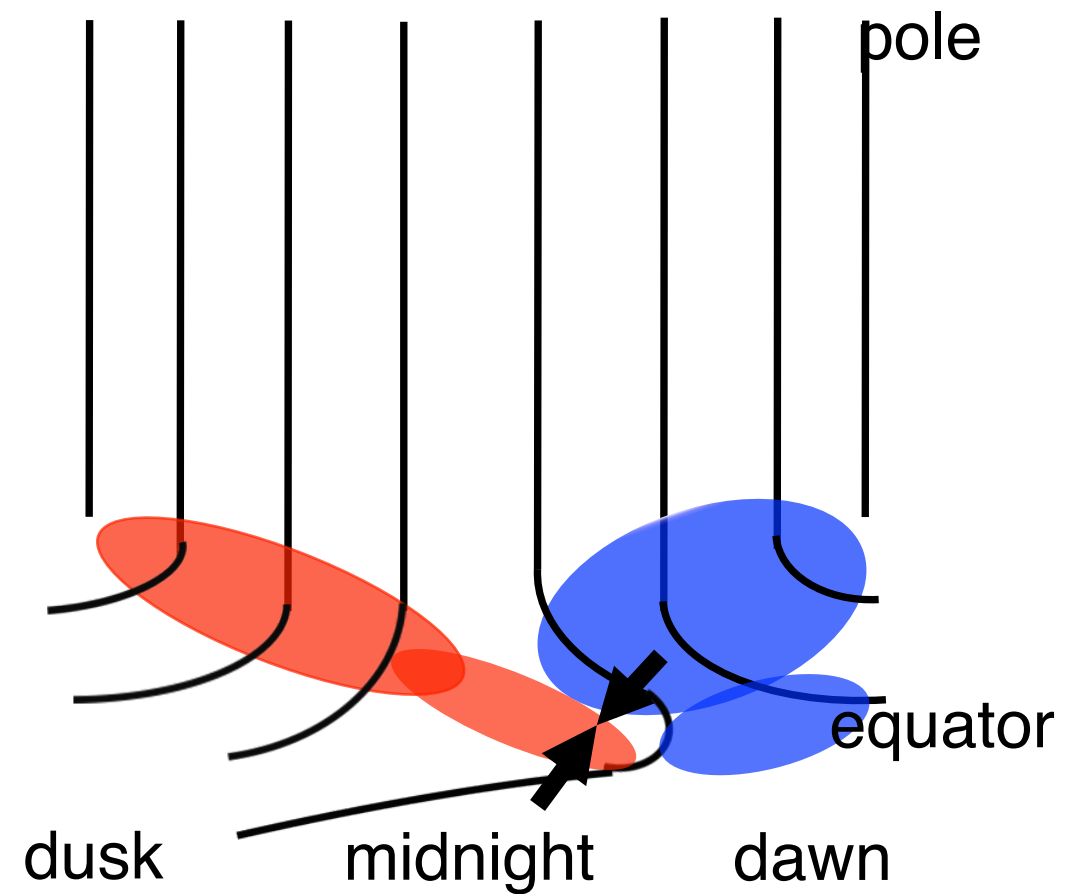
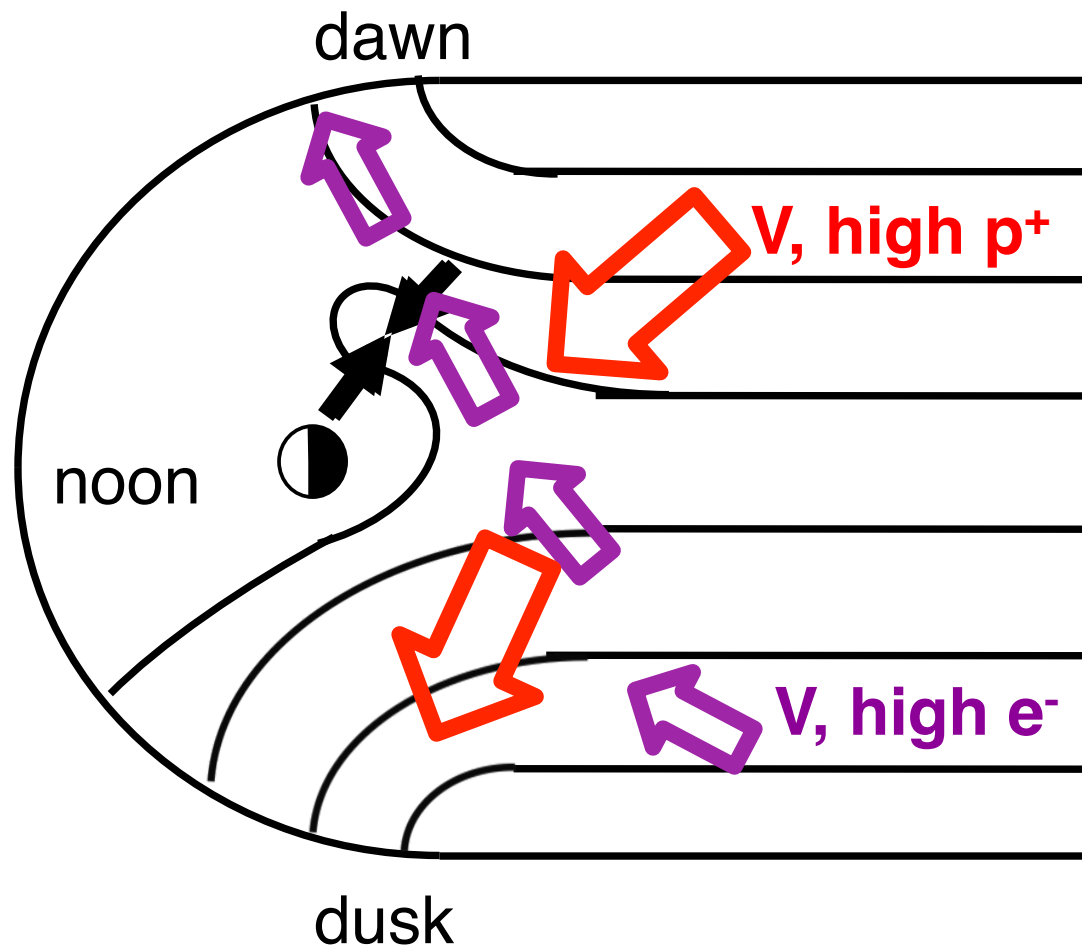
Physics of Harang reversal



Physics of Harang reversal

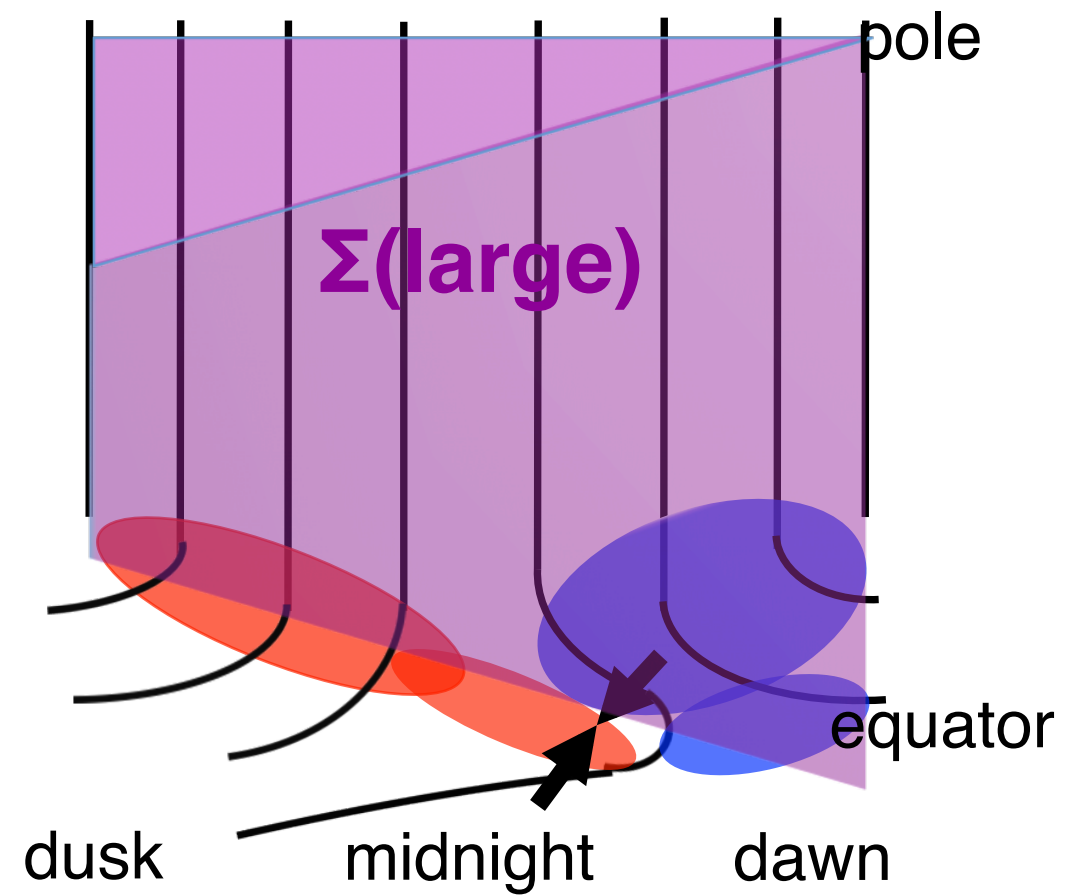
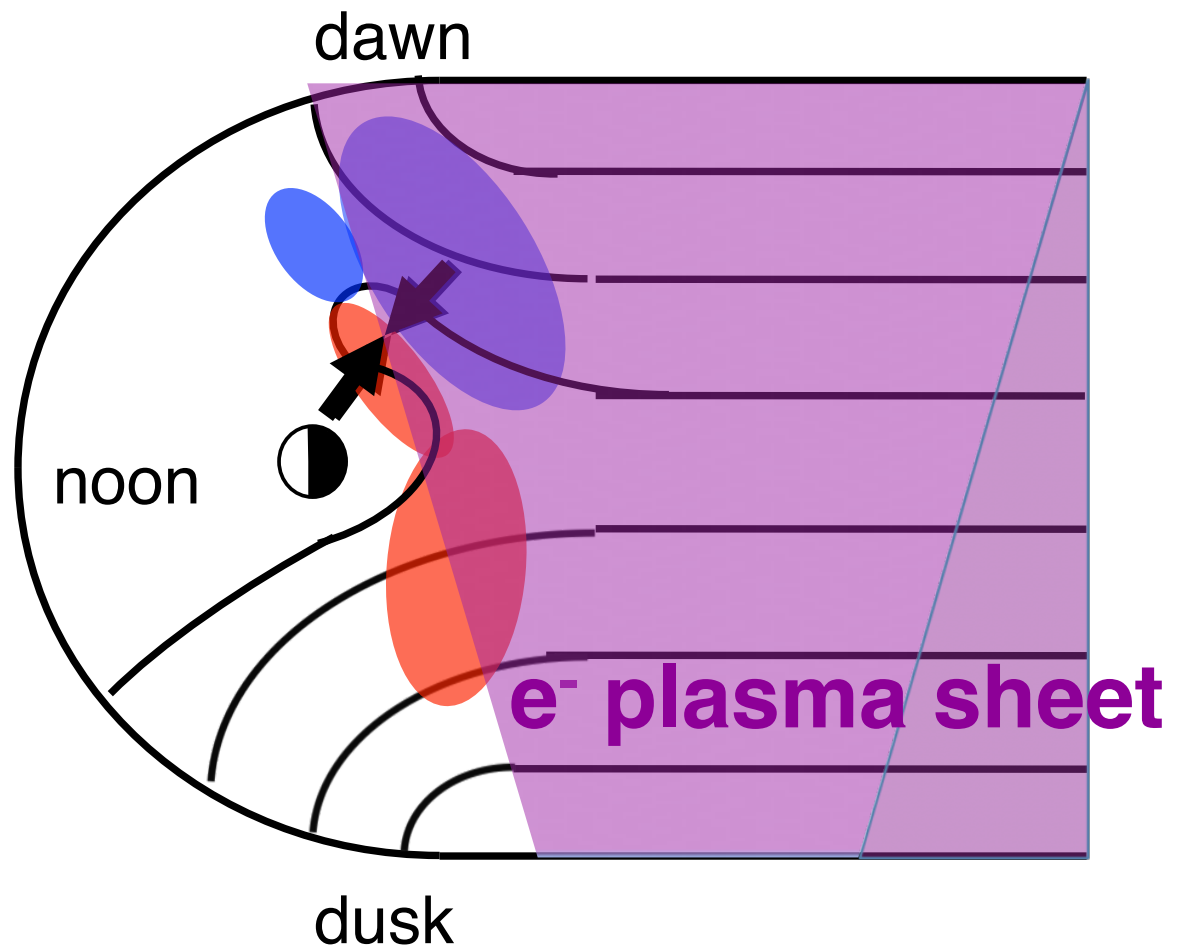


Physics of SAPS

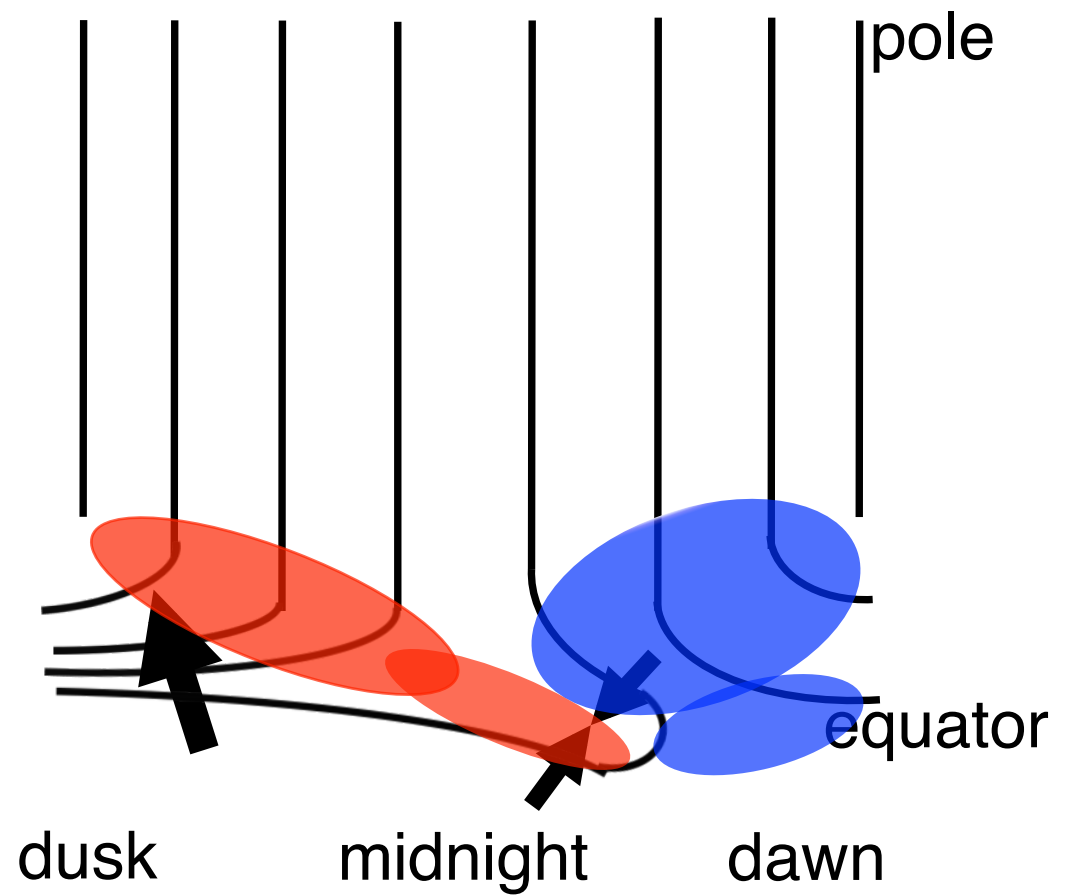
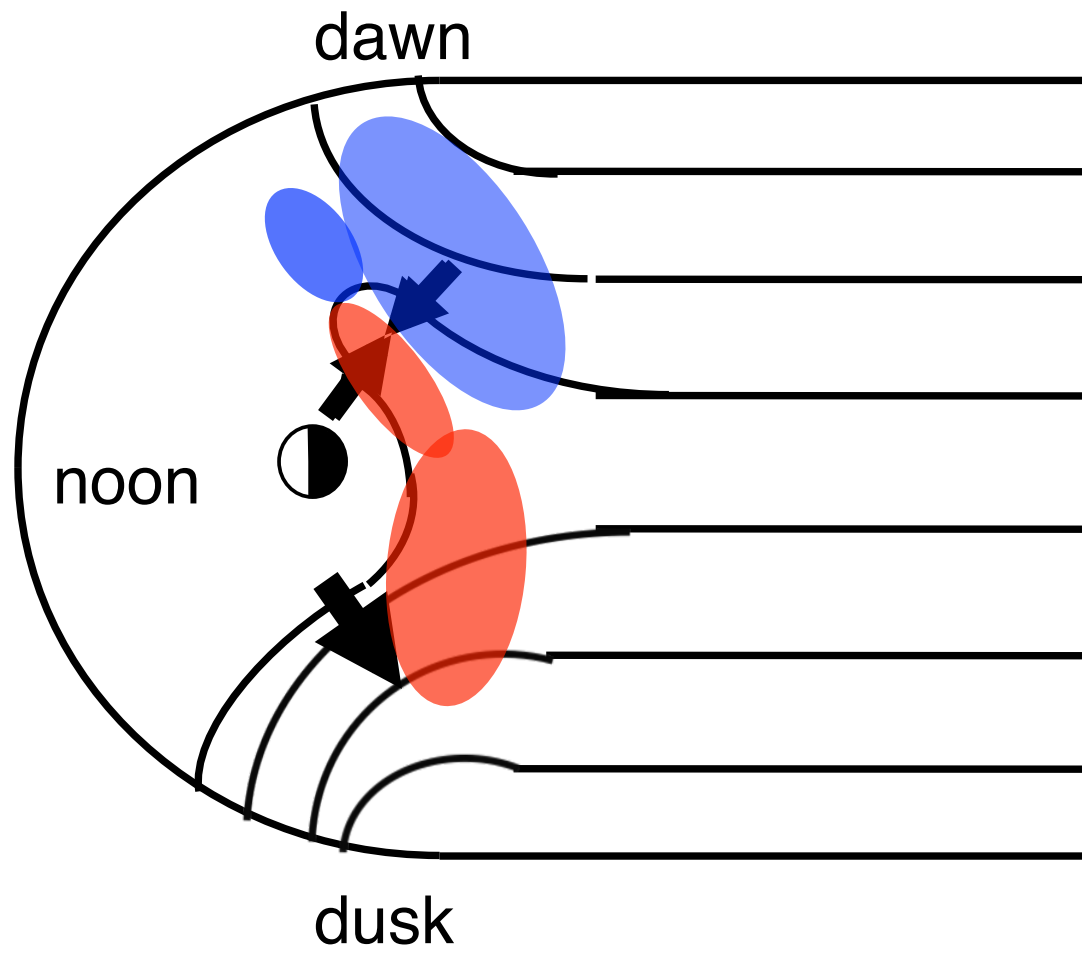


different dawn-dusk asymmetries
for high-energy protons and
electrons due to magnetic drift

Physics of SAPS



Physics of SAPS



R-2 FACs, shielding, Harang reversal, SAPS

