

# **Polar cap current**

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The cross polar cap current should be the difference between the Region 1 and Region 2 currents. We can calculate the cross cap current by using our digital ionosonde measurements to get the electric field and also use our measurements to calculate the conductivity. Having done this we can compute the current and compare this current with estimations of the Region 1 and Region 2 currents to verify that there is current balance. In particular there are known seasonal variations of the currents and electric fields, and all these currents and fields vary as a function of several solar wind-magnetosphere parameters. We will examine under what conditions there is current balance. We will also discuss the situation during high IMF Bz conditions (usually magnetic storm conditions) when the polar cap potential becomes saturated.