



Particle accelerations observed above the polar cap during periods of Northward IMF

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During quiet periods of Northward IMF, Cluster observed particle acceleration structures above the polar cap at high altitudes. The associated electric field signature suggests that these accelerations results from a potential drop aligned along magnetic field lines. Similar phenomena are observed above the auroral zone where they lead to structured precipitations; they are explained as consequences of the couplings between the auroral ionosphere and the tail plasmashet during active periods. The polar cap magnetic field lines are open, extended in the tail; they can be connected to the flank boundary layer or the mantle but not to a dense and active plasma reservoir as the plasmashet. Cluster 4-spacecraft observations of electrons and ions allow to quantify the potential drop and its distribution along magnetic field lines, its life time, its perpendicular size. Finally, we discuss the processes that could be responsible for such particle accelerations above polar cap during periods of Northward IMF.