



Oxygen ion outflow observed at high altitude

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The results of a case study of oxygen ion outflow using Cluster data obtained at high altitude above the polar cap are reported. In the statistical study which has been made before this case study one of the major features is: The oxygen temperature ratios are anisotropic, oxygen has a higher perpendicular temperature. A long adiabatic transport from a heating region well below the spacecraft should give a higher parallel temperature. The outflowing oxygen is heated in high altitudes. The questions we want to answer with this case study are: What are the physical mechanisms and structures for such heating? In the case study the perpendicular temperature for oxygen is at least twice as big as the parallel temperature and the ratio remains similar for a long time, 20 minutes. There is high magnetic activity during this case. The case is compared with the more common cases with heating under short time intervals. The wave data and multi spacecraft measurements are used to investigate the spatial and temporal structure of the perpendicular heating events.