Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00823, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00823
EGU General Assembly 2008

Cluster hot flow anomaly observations during a half solar cycle

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Hot flow anomalies (HFAs) are studied using observations of the FGM magnetometer and the CIS plasma detector aboard the four Cluster spacecraft. Previously we studied several specific features of tangential discontinuities on the basis of Cluster measurements in February-April 2003 when the separation of the spacecraft was large and discovered a new condition for forming HFAs, that is the solar wind speed and its dynamic pressure is higher than the average. This new condition was also confirmed by simultaneous ACE MAG and SWEPAM solar wind observations at the L1 point 1.4 million km far from the Earth. The measured and calculated features of HFA events were compared with the results of previous hybrid simulations. In this study we analyze HFAs under different s/c separations from 2003 to 2007 which interval covers a half solar cycle period. During the whole spring season of 2003, the solar wind speed was higher than the average. Here we can check whether the higher solar wind speed is a real condition of HFA formation also from 2004 to 2007.