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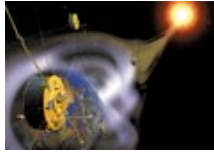


La mission Cluster

Premiers résultats

C. Philippe Escoubet
ESA Project Scientist

- La relation Terre - Soleil
- Orage Solaire du 8 Novembre 2000
- Traversée du cornet polaire



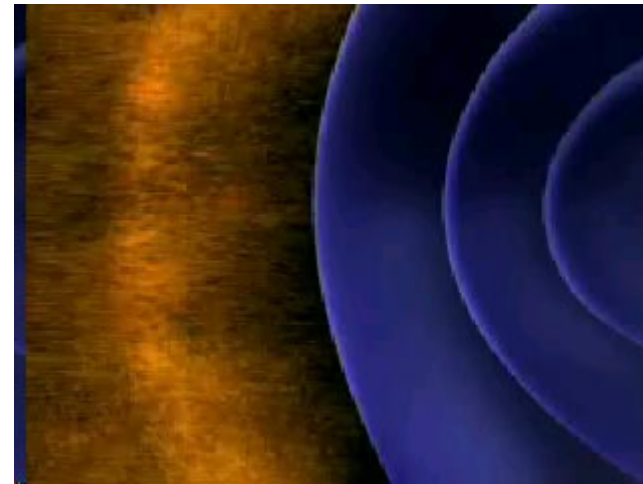
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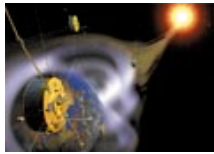
La liaison Terre - Soleil



Le Soleil



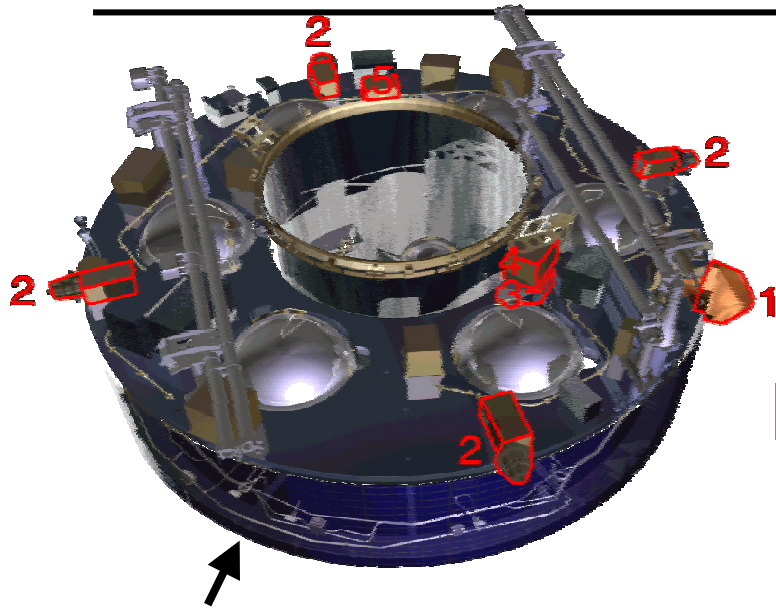
La magnetosphère



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Instruments



- 1 **STAFF** (N. Cornilleau-Wehrlin, F)
Magnetic and electric fluctuations
- 2 **EFW** (G. Gustafsson, S)
Electric fields and waves
- 3 **DWP** (H. Alleyne, UK)
Wave processor
- 4 **WHISPER** (P. Decreau, F)
Electron density and plasma waves
- 5 **WBD** (D. Gurnett, USA)
Electric field wave-forms

1 **PEACE** (A. Fazakerley, UK)

Electrons ($E < 30$ keV)

2 **CIS** (H. Reme, F)

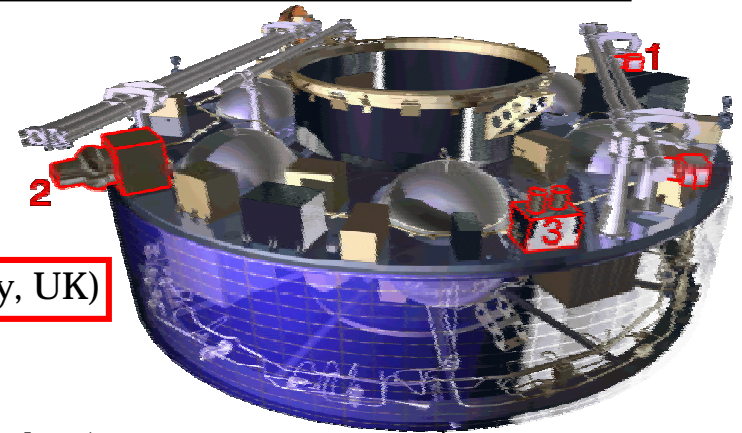
Ion composition ($E < 40$ keV)

3 **RAPID** (B. Wilken, D)

High energy electrons and ions

($2 < E_{\text{ions}} < 1500$ keV/nuc,

$20 < E_e < 400$ keV)



1 **FGM** (A. Balogh, UK)

Magnetic field

2 **EDI** (G. Paschmann, D)

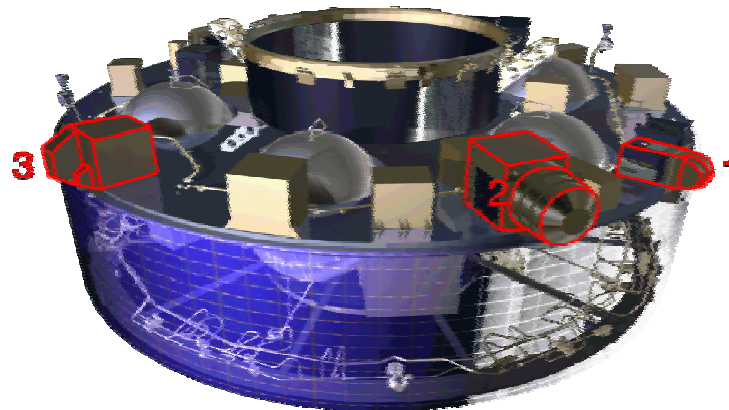
Plasma drift velocity

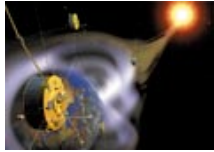
($0.1 < E < 10$ mV/m,

$5 < B < 1000$ nT))

3 **ASPOC** (W. Riedler, A)

S/C potential control

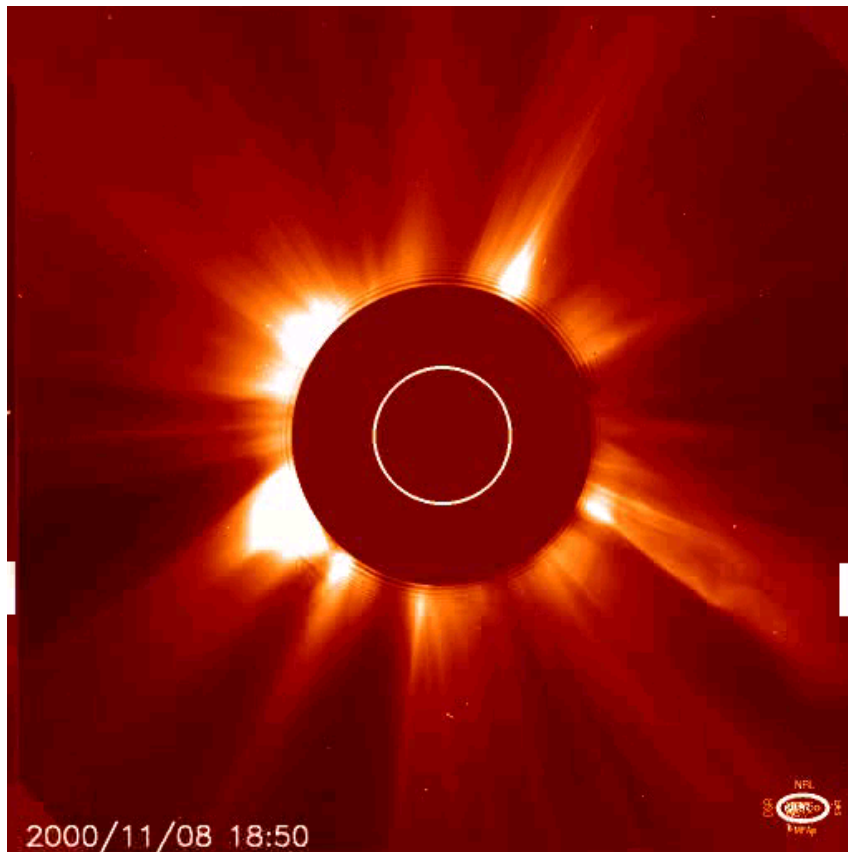




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Orage solaire du 8 Novembre 2000



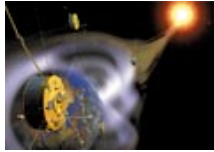
SOHO LASCO



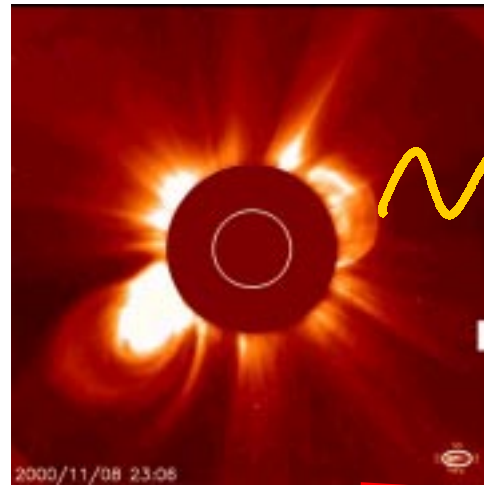
- Debut:
23:06 UT



23:26 UT

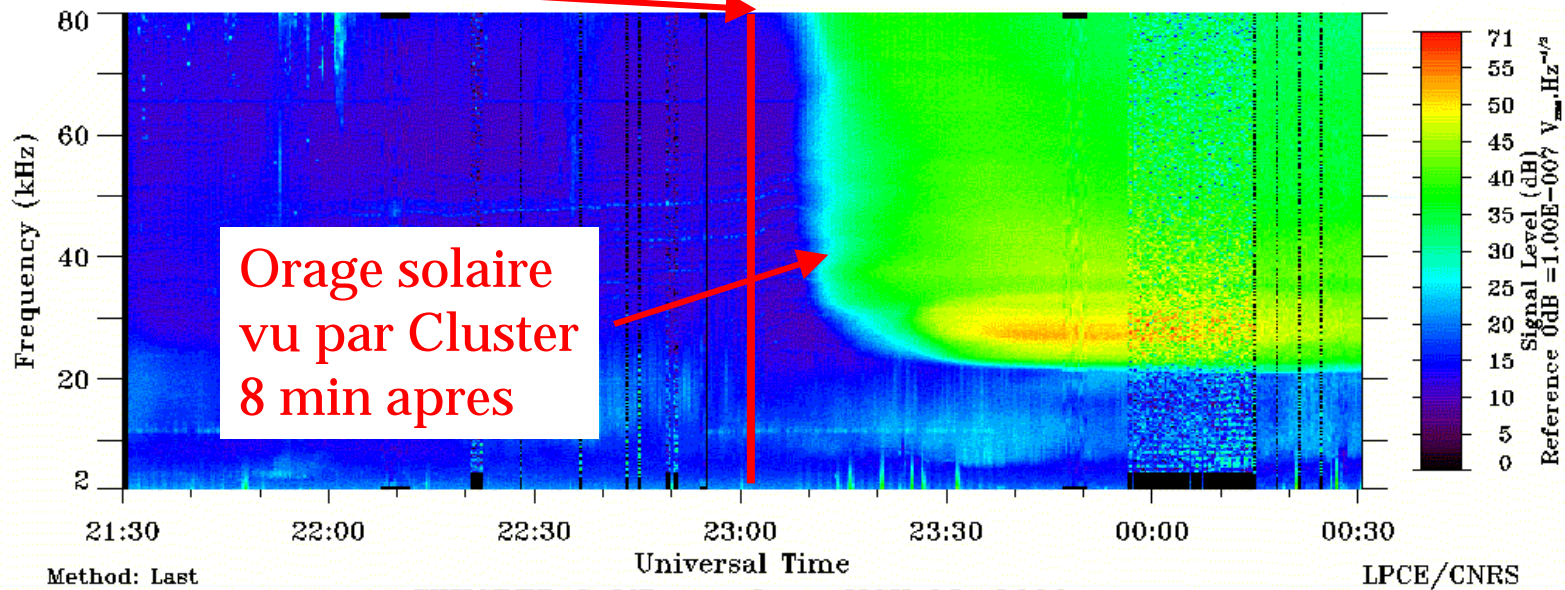
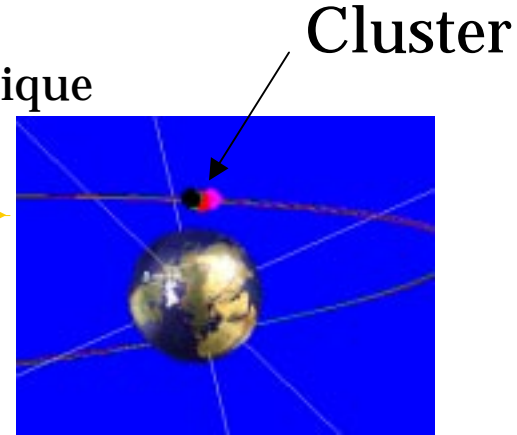


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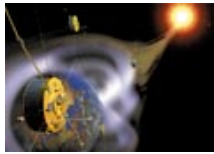
Onde
Electromagnetique

8 min
pour arriver
a la terre



Orage solaire
vu par Cluster
8 min apres

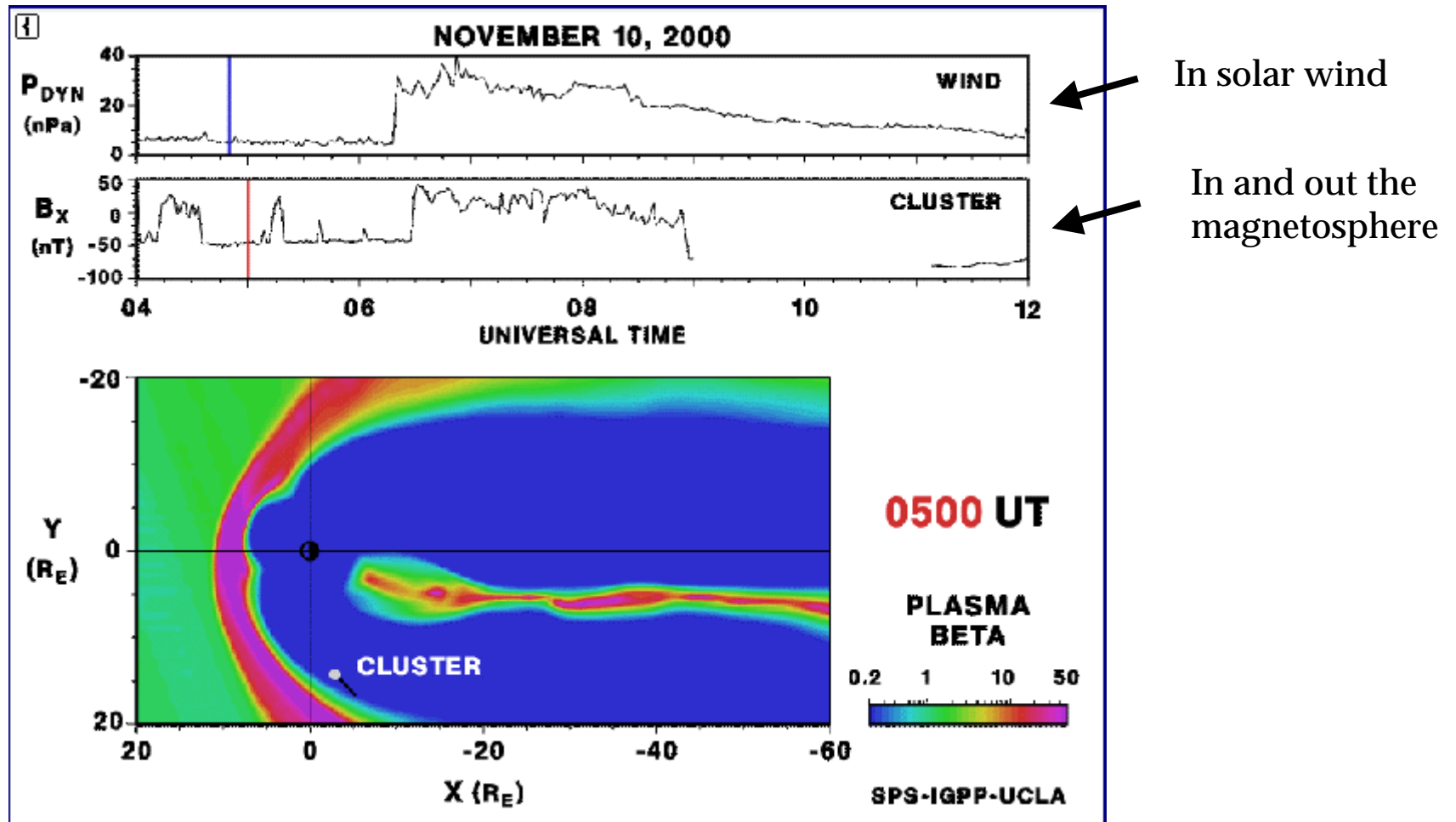
(donnees WHISPER, P. Decreau, LPCE, F)



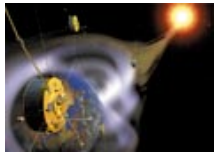
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Effect of solar storm on the magnetosphere



(simulation, J. Berchem, UCLA, USA)



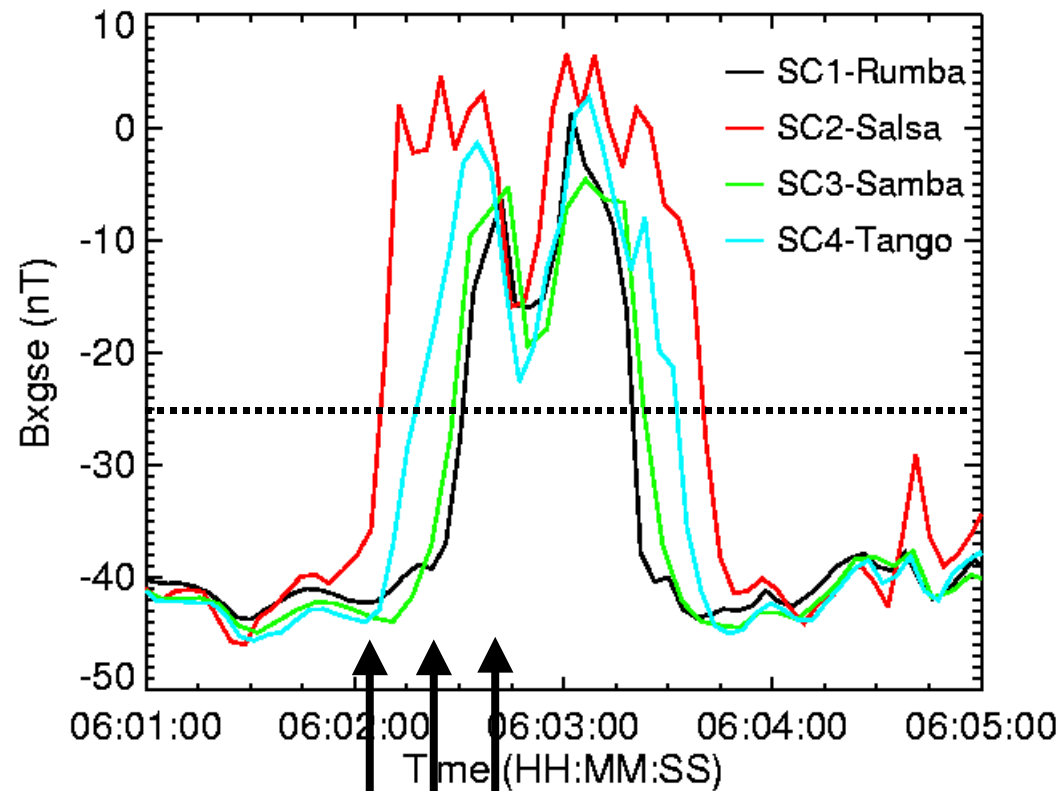
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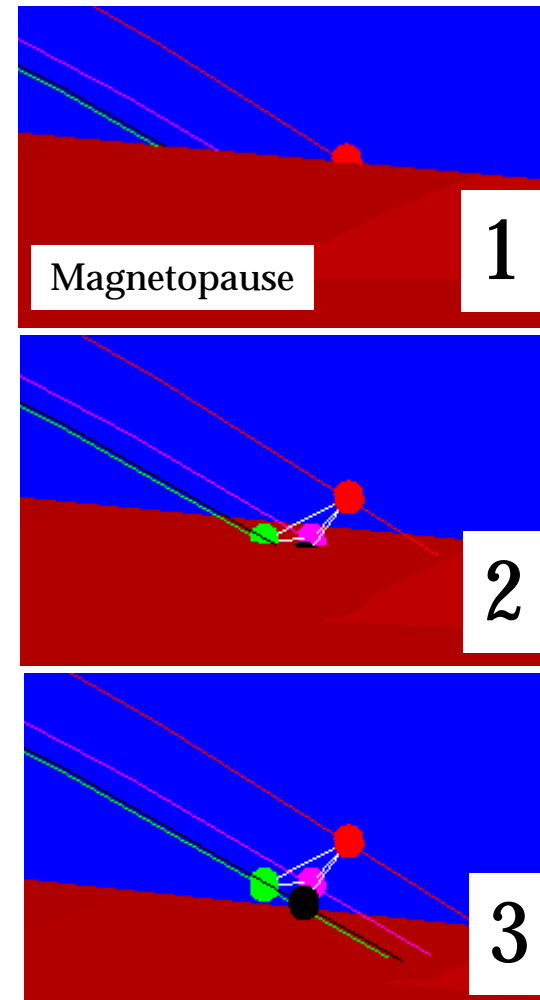
Traversée de la Magnetopause pendant l'orage

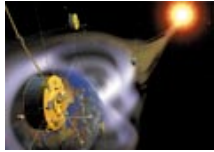
(FGM data, A. Balogh, IC, UK)

Cluster FGM - 10/11/2000



1 2 3

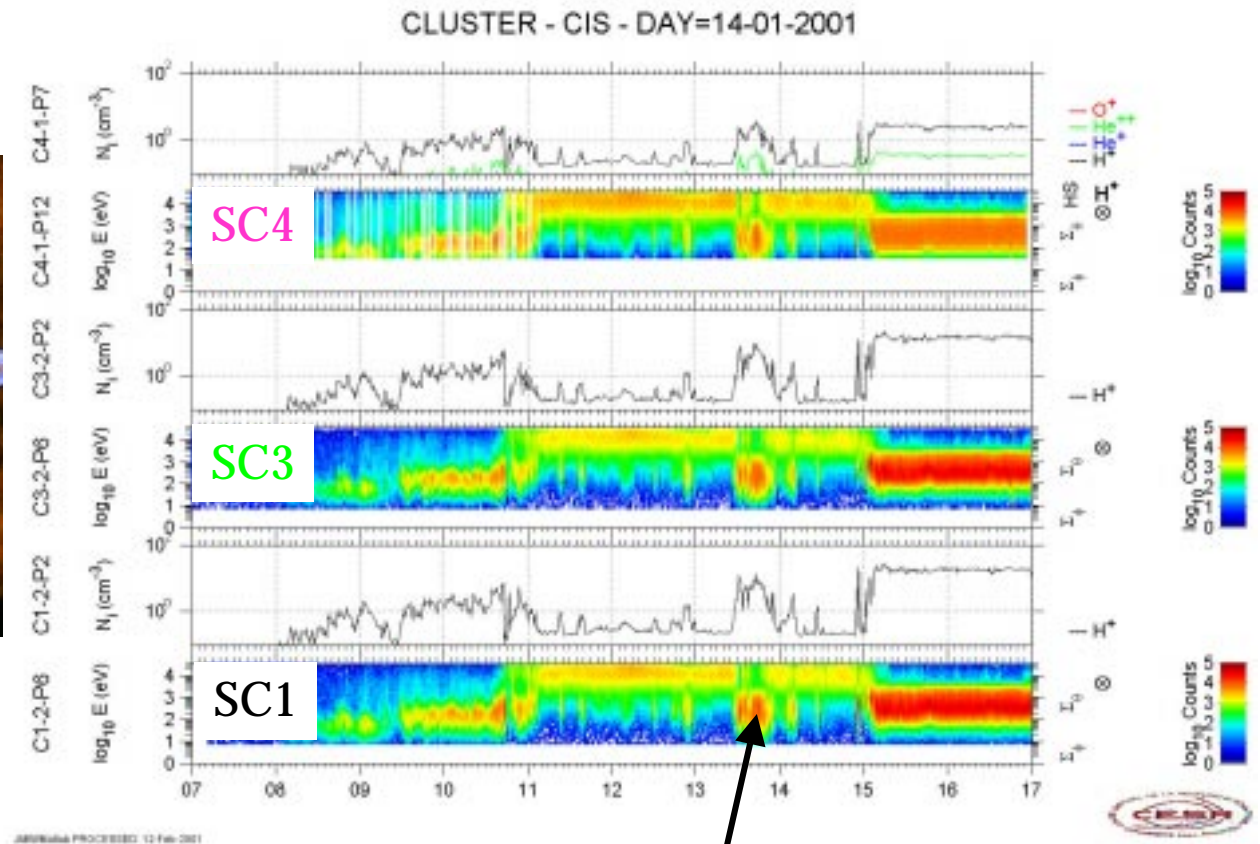
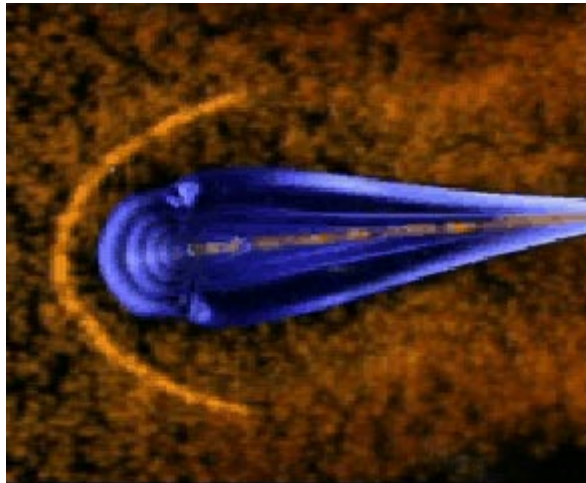




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Traversée du cornet polaire le 14 January 2001

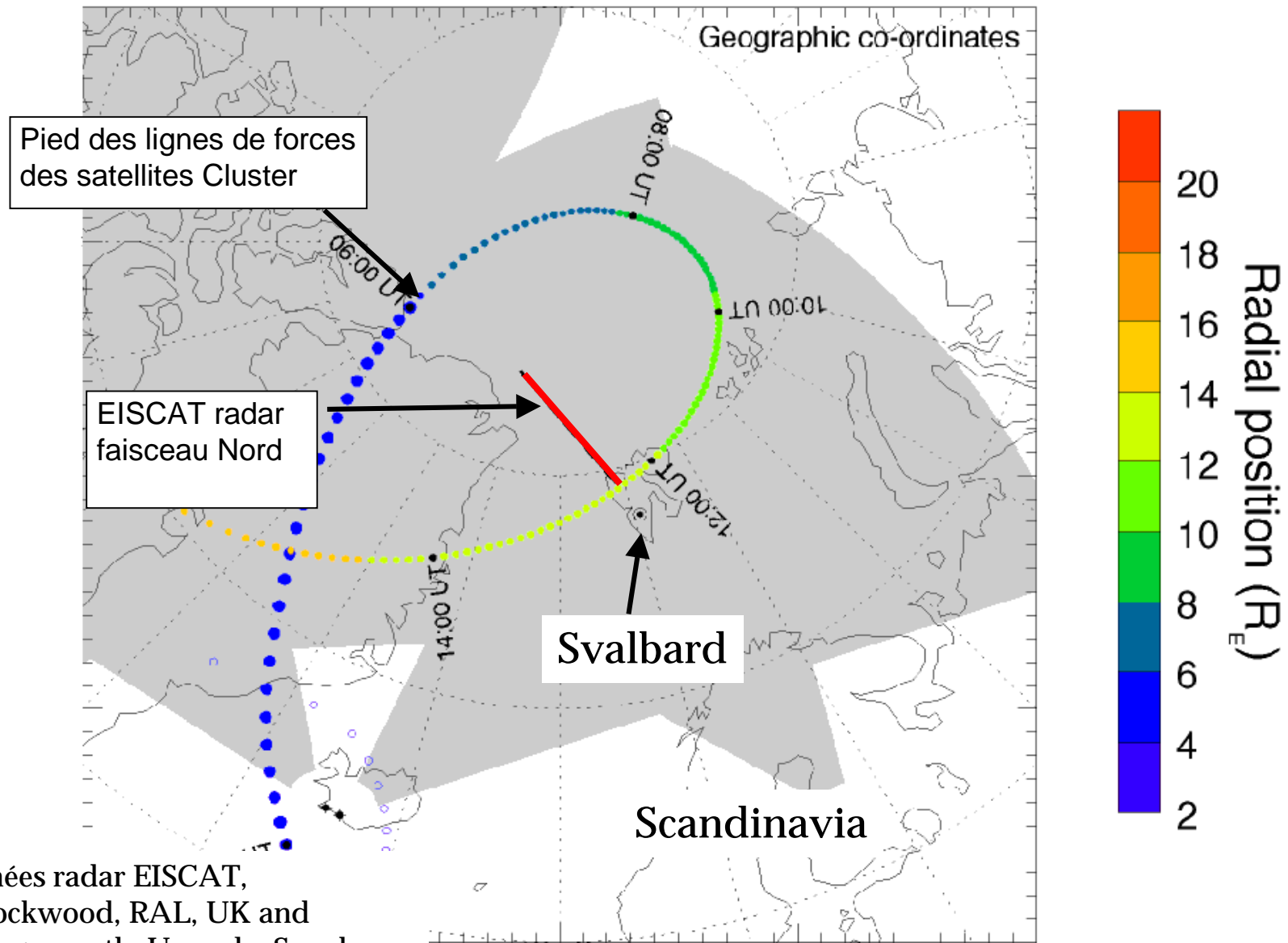


Cornet polaire

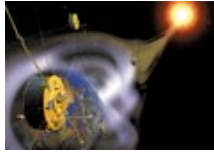
CIS data, H. Reme et J. M. Bosqued, CESR, F

Cornet polaire se déplace vers Cluster

14 January 2001



Données radar EISCAT,
M. Lockwood, RAL, UK and
H. Opgenoorth, Uppsala, Sweden

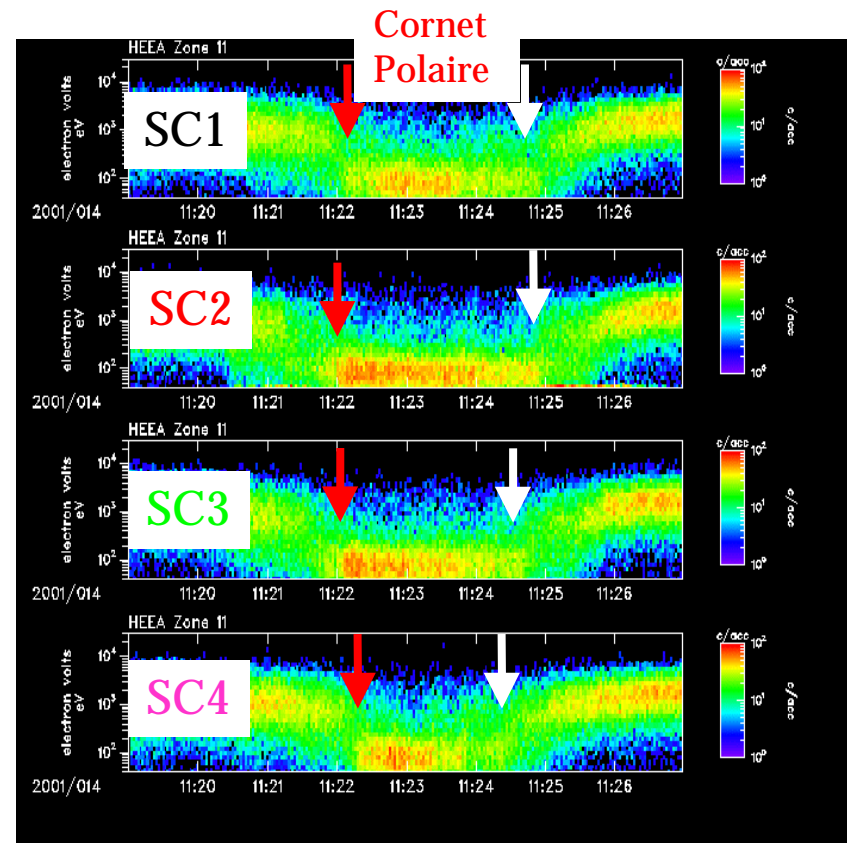
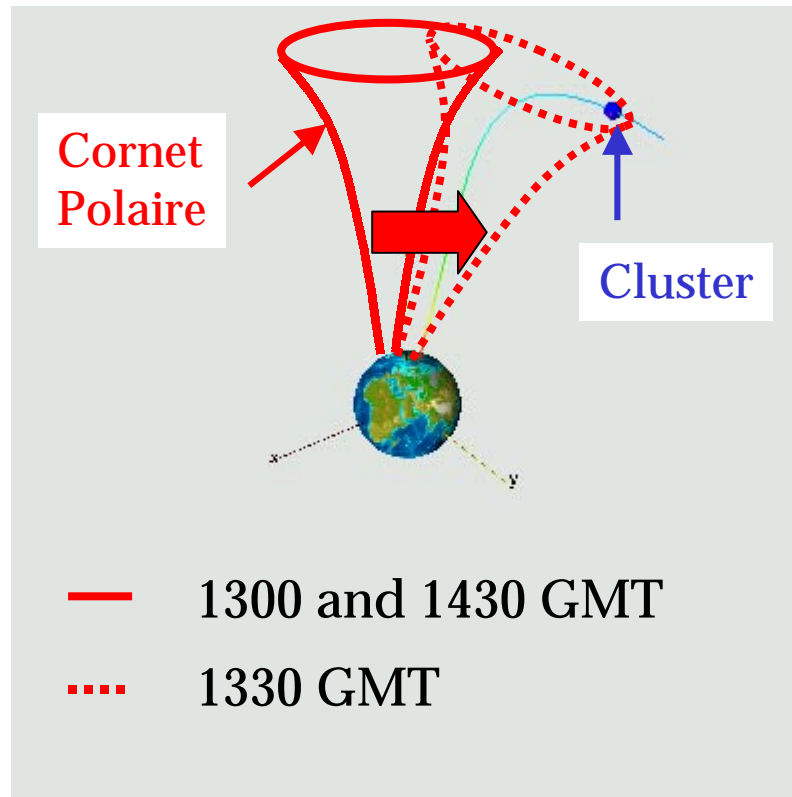


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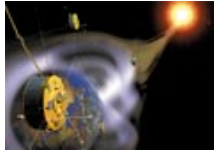


Mouvement du cornet polaire

le temps de traversée des frontières et la distance entre les satellites donne la vitesse du cornet polaire entre 10 et 30 km/s



Données PEACE, A. Fazakerley, MSSL, UK



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Conclusion

- Cluster est parfaitement équipé pour étudier l'effet des orages solaires sur notre environnement terrestre.
- Les cornets polaires qui jouent un rôle clé dans la liaison Terre-Soleil sont très dynamiques et leur mouvement peut être étudié très précisément avec les 4 satellites Cluster.