

Effect of the April 5, 2010 storm on GPS positioning Errors at Yamoussoukro



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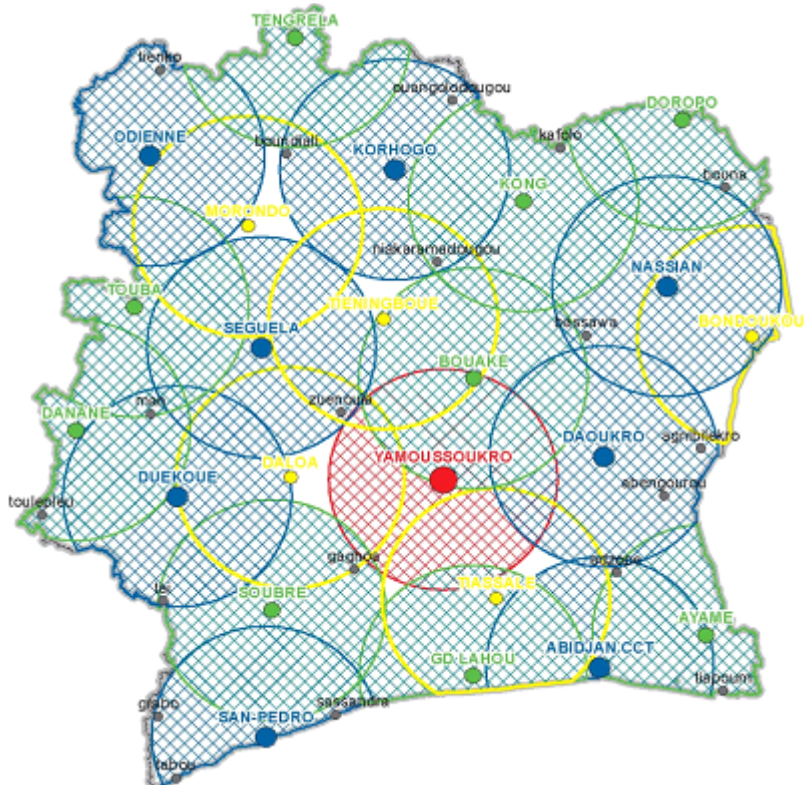
1. Laboratoire de Physique de l'Atmosphere, Universite FHB Cocody

2. Departement de Physique, Universite GP de Korhogo

3. Centre de Cartographie et Teledetection /BNETD

The project « past-gnss-ci »

Projet d'application scientifique et topographique des système de navigation par satellite en Cote-d'Ivoire



OBJECTIVES

- We plan to establish a National Network of 16 GNSS stations
- Establish a national data based online
- For Scientific research
- Applications to improve the national cadastral, natural resources management

Joint Project

1. The University FHB Cocody/The Atmospheric Physics Laboratory

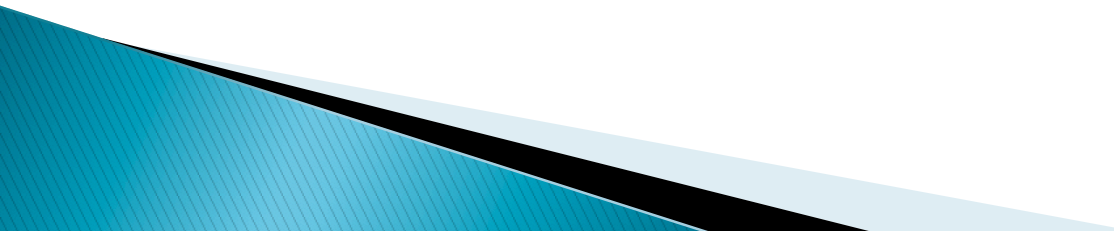


2. The Bureau National d'Etudes Technique et de Développement/Mapping and Remote sensing department

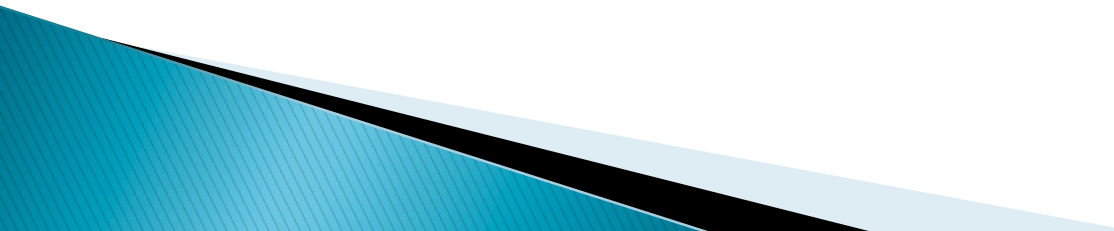


3. Local Partners/Sponsors
4. Regional Partners/Sponsors
5. International Partners/Sponsor

Local Partners

- ▶ Engineering School of ICT /ESATIC
 - ▶ National Fund of Telecommunication
 - ▶ Cadastral Directorate
 - ▶ Geographic Information System Department
- 

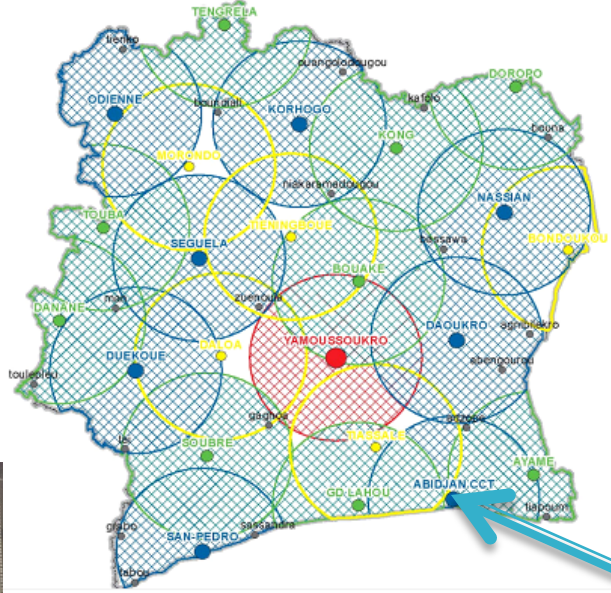
Regional Partnership

- ▶ CAR/NASRDA Center for Atmospheric Research Anyagba Kogi state Nigeria
 - ▶ Space Science Department /SANSA
 - ▶ ECOWAS
- 

The international partners

- ▶ BOSTON COLLEGE /ISR
 - ▶ TWAS / Research Fellowship
 - ▶ ESA /ESTEC
 - ▶ ICTP/ICT4D
 - ▶ NASA/JPL
 - ▶ UNAVCO
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The AMBER Magnnetometer



<http://magnetometers.bc.edu/index.php/amber>

Stations under operation

Station of Yamoussoukro / 1



The station of Abidjan /2



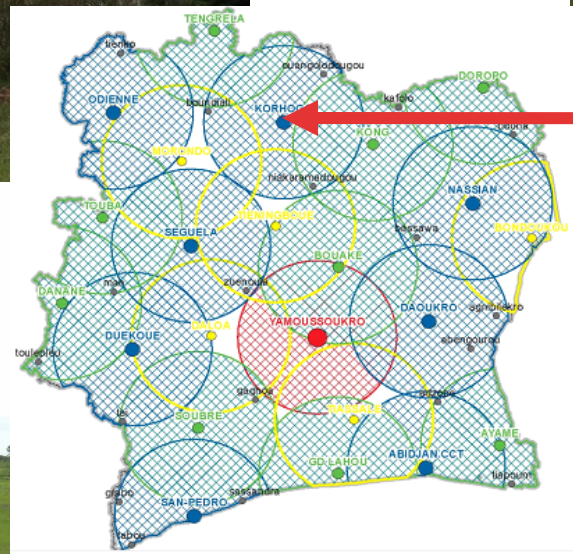
Next step-1

Former Ionosonde sounding station of Korhogo



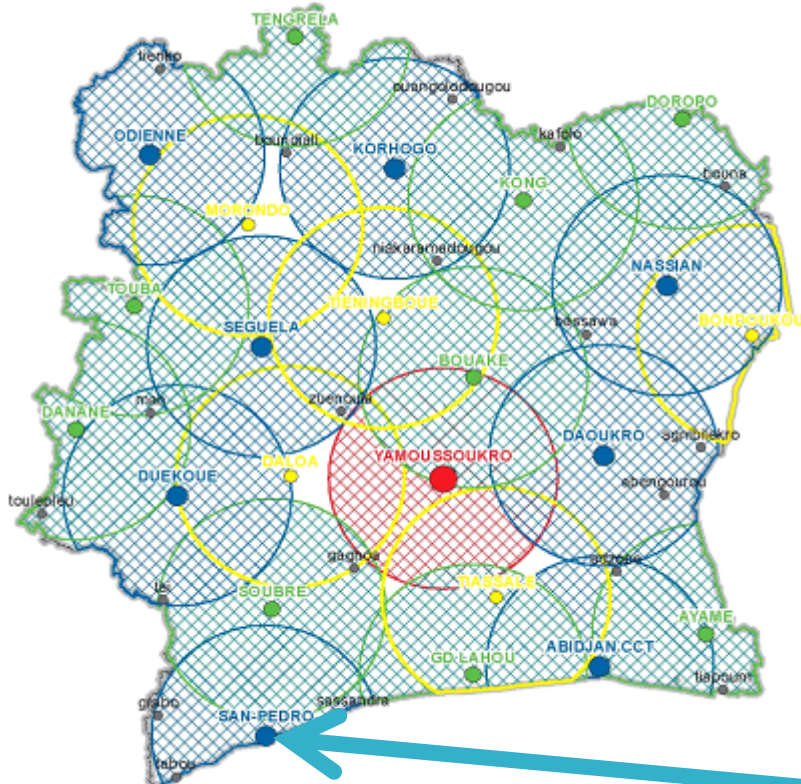
By January 2015, The station of Korhogo will be operational

The future location of the site



Main entrance of PGC University of Korhogo

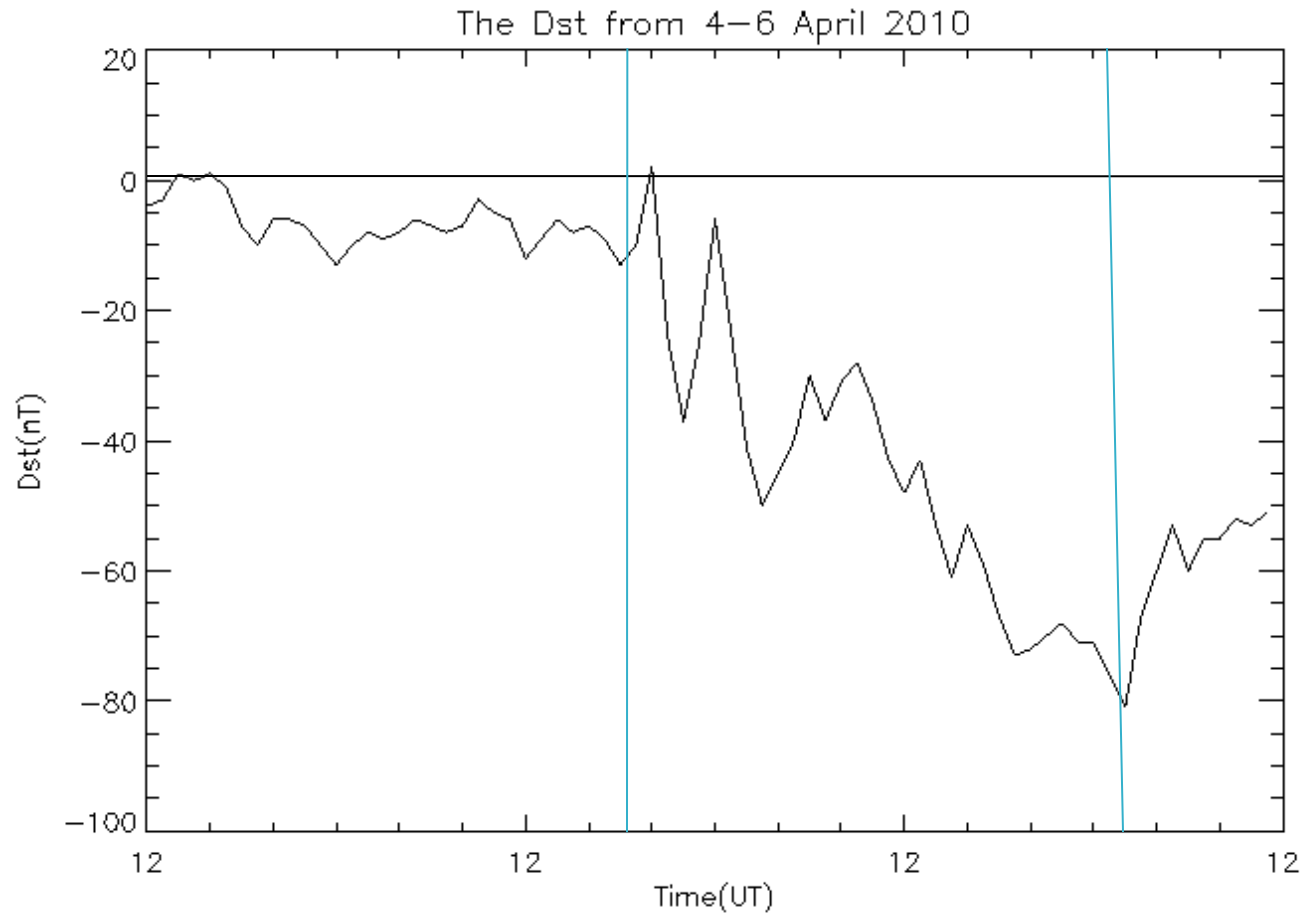
Next step-2



Planned to be install before June 2015
In San-Pedro at the regional office of
BNETD/CCT



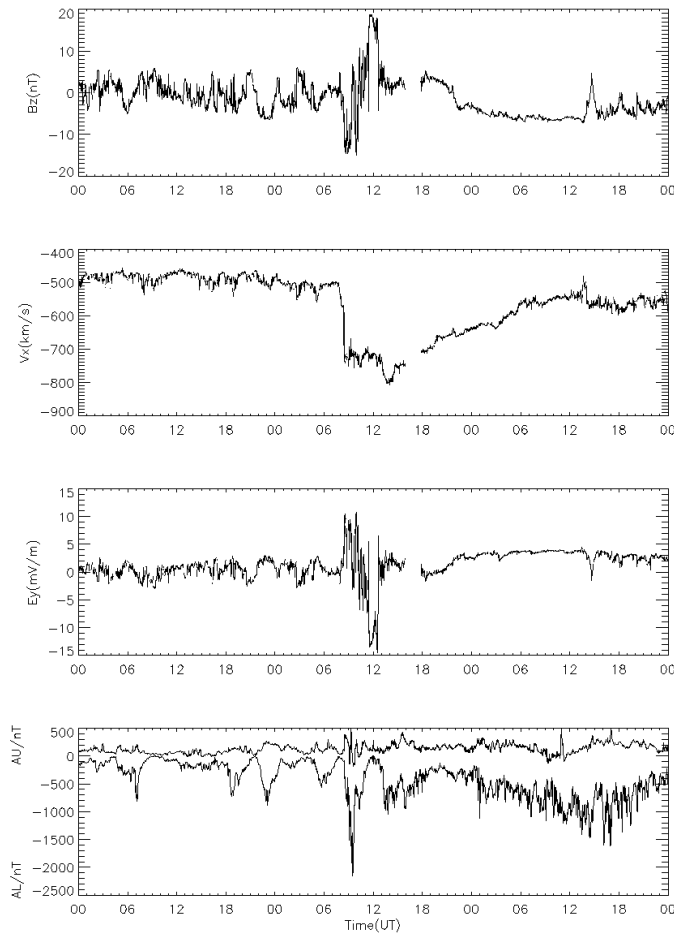
The Geomagnetic context of 5–6 April 2010 in terms of Dst



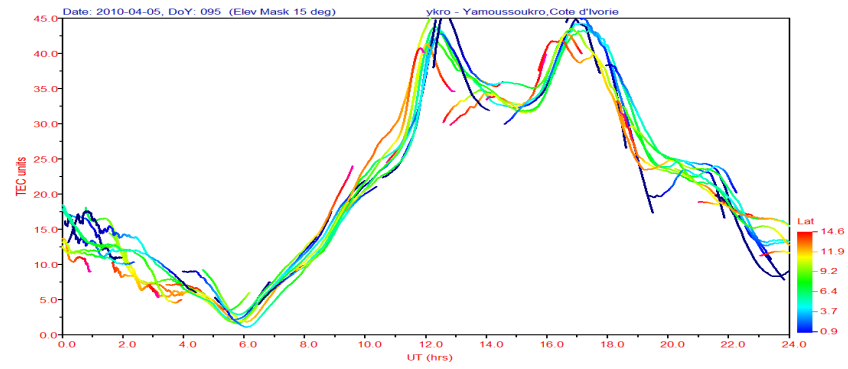
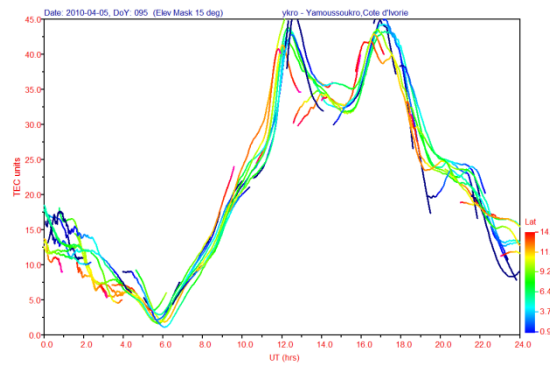
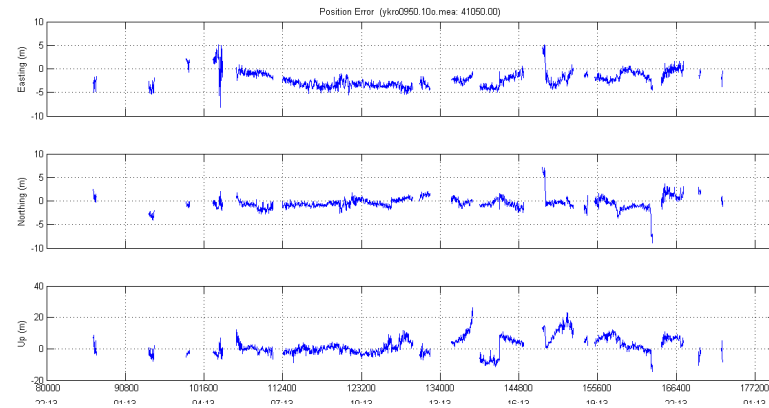
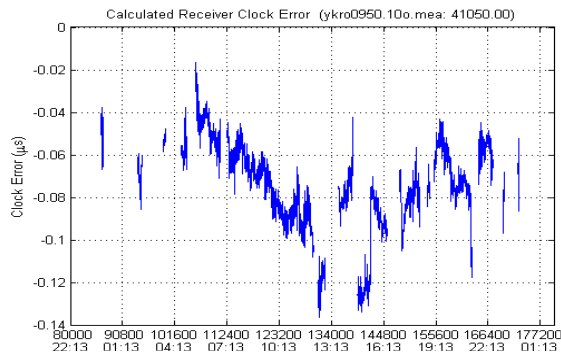
The solar wind magnetic field and plasma 4–6 April 2010

The first significant geomagnetic storm of solar cycle 24

V_x increased from 498 to 800 km/s
On April 5.



Diurnal variation of the position errors on April 5, 2010



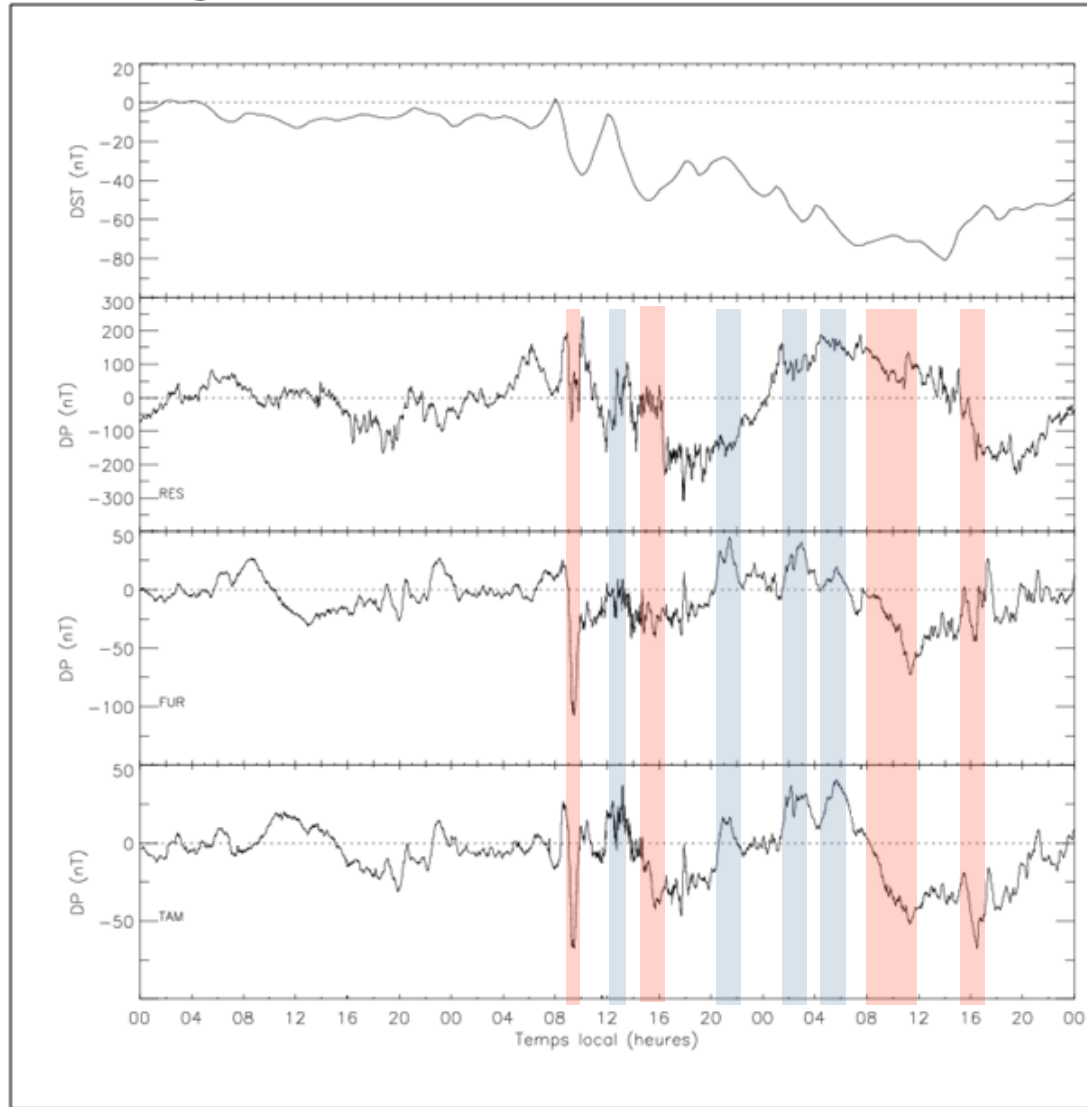
Effects of the DP on the errors

$$DP = H - DR - Sr(H)$$

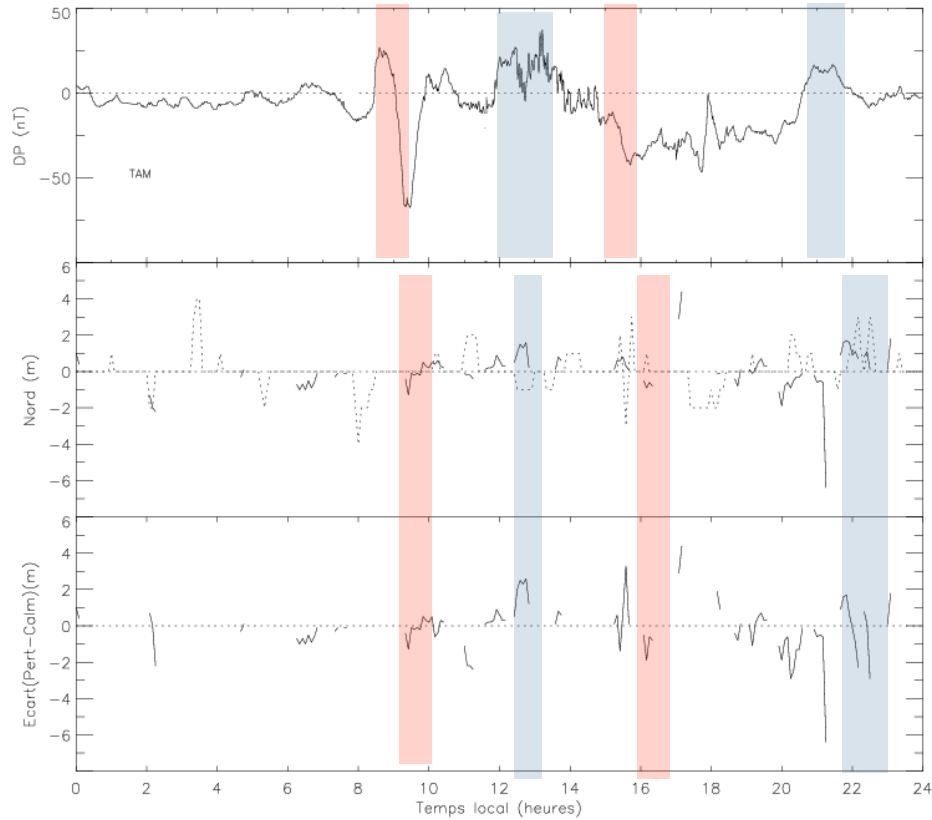
The magnetic signature of the prompt penetration of the Eastward Electric field known as DP2 is characterized by an increasing of the DP from high to low latitude

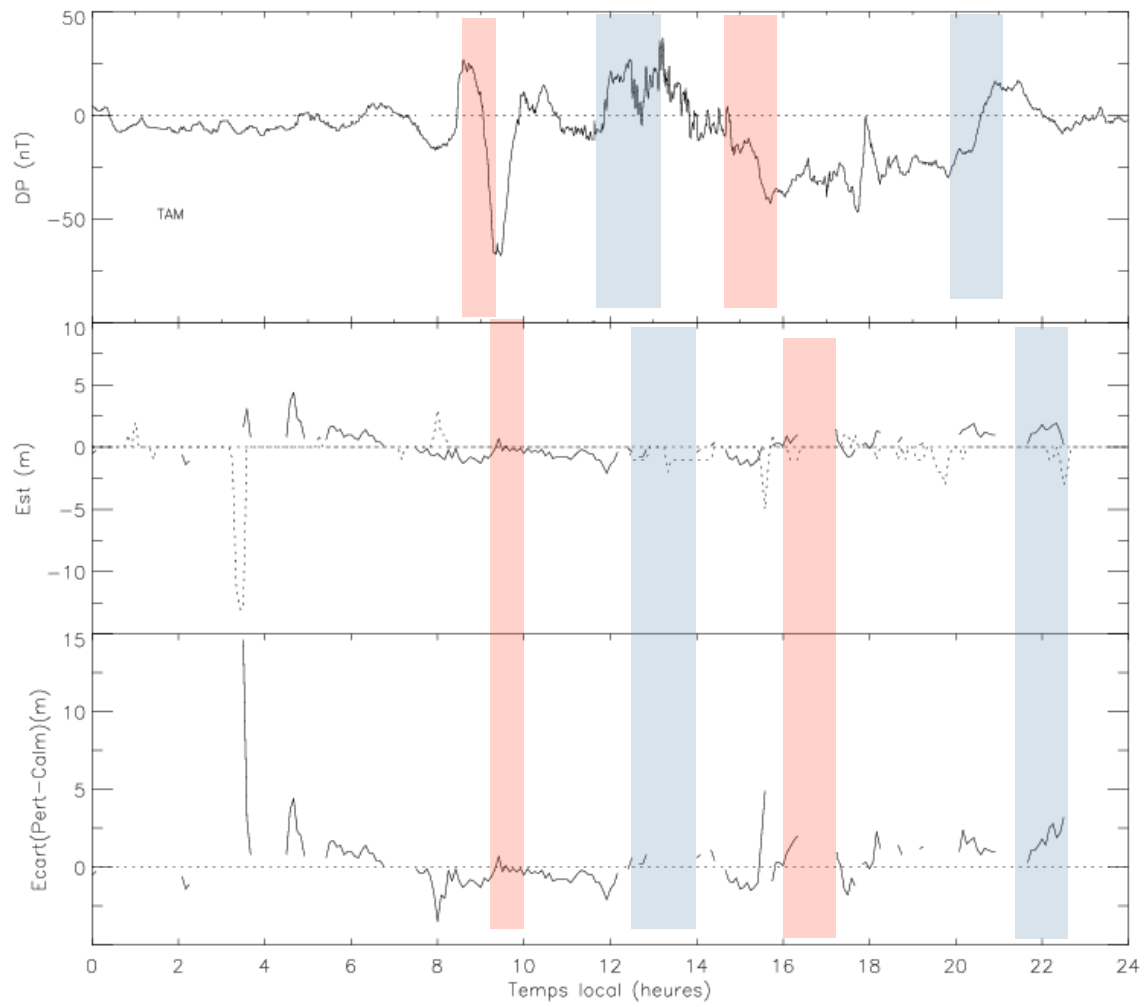
The westward Electric Field, known as Overshielding is characterized by a decreasing of the DP from high to low latitude. (Nishida, 1968)

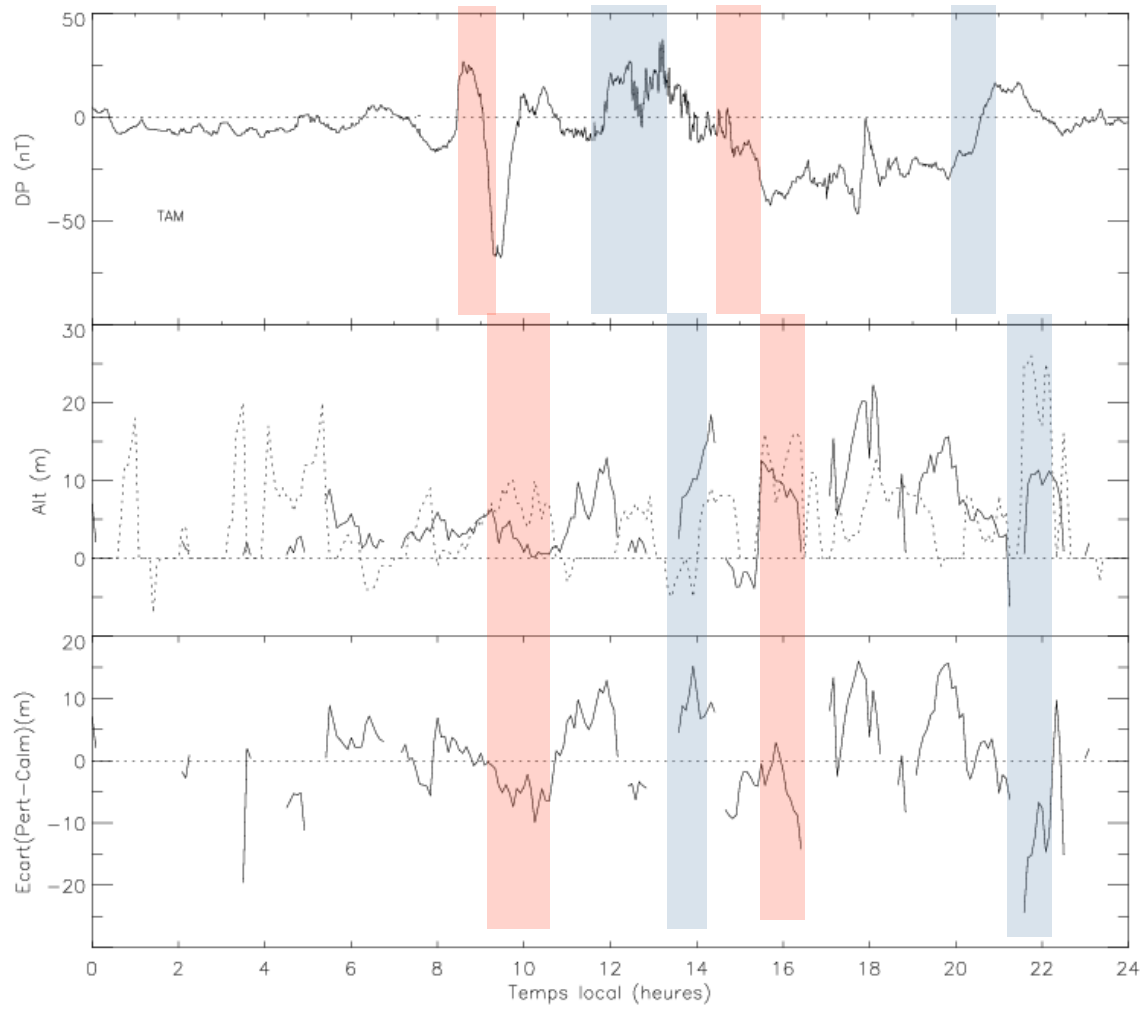
DP from RES(high lat) FUR (mid lat) and Tamanrasset (low lat)



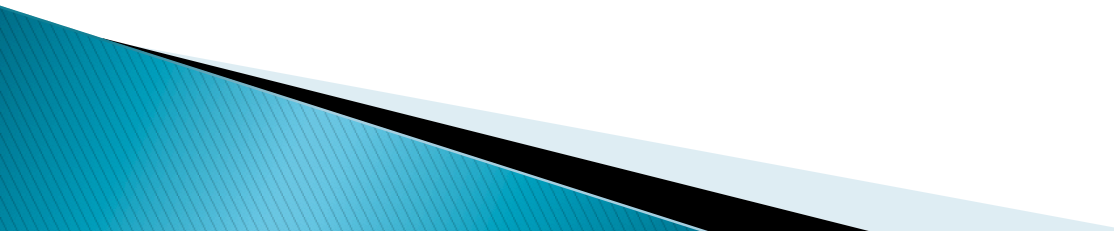
Diurnal variation of the DP and the Northern error







Summary

- ▶ The result show that a geomagnetic storm can create a enhancement or a depletion of the TEC.
 - ▶ The case of this particular day has shown a decreasing of the positioning errors on all directions.
 - ▶ For the project all initiative are welcomed
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Thanks for your attention

