STAFF/SC Calibration & Cross-Calibration activities

Patrick ROBERT, C. Burlaud & STAFF Team

1) State of Calibrated WaveForm product

- CCM program is running; parameters are defined
- Some details remain to be done before mass processing

2) FGM comparisons

- Reminder
- Various examples of monochromatic waves:
  - at ~ 6 Hz / SR2 coordinates,
  - at ~ 1 Hz / SR2 “,
  - at ~ 1 Hz / GSE “, filtered: CWF product

3) Conclusions

1) State of Calibrated WaveForm product

⇨ **CCM program is running**.

- Test on kernel size (length of calibration window) achieved.
  Results lead to 1024 pts in NBR to avoid some modulation at 2*Fs on continuous despin signal.

- Note that below (512 pts), a ~ 0.2 degrees phase modulation of spin signal in raw data is observed.

⇒It induces a few nT modulation on X and Y components of the calibrated signal.

Conclusion: 1024 pts are required to get a good data quality !

⇨ **Some details remain to be done before mass processing.**
(saturation checks, data gaps management....)

- But no new problems expected.
  Exploitation should start soon ...

2) STAFF/FGM comparisons

⇨ Reminders :

- Bx and By DC field and low frequencies could be compared in SR2 coordinates, but theoretically only for left-handed polarized wave (see 10th meeting).
- Only fluctuations above ~ 0.5 Hz could be fully compared with FGM data, in SR2 or GSE coordinates.
- As CWF product will be filtered data in GSE coordinate system, final check with FGM should be done in this system. (action required after last meeting).

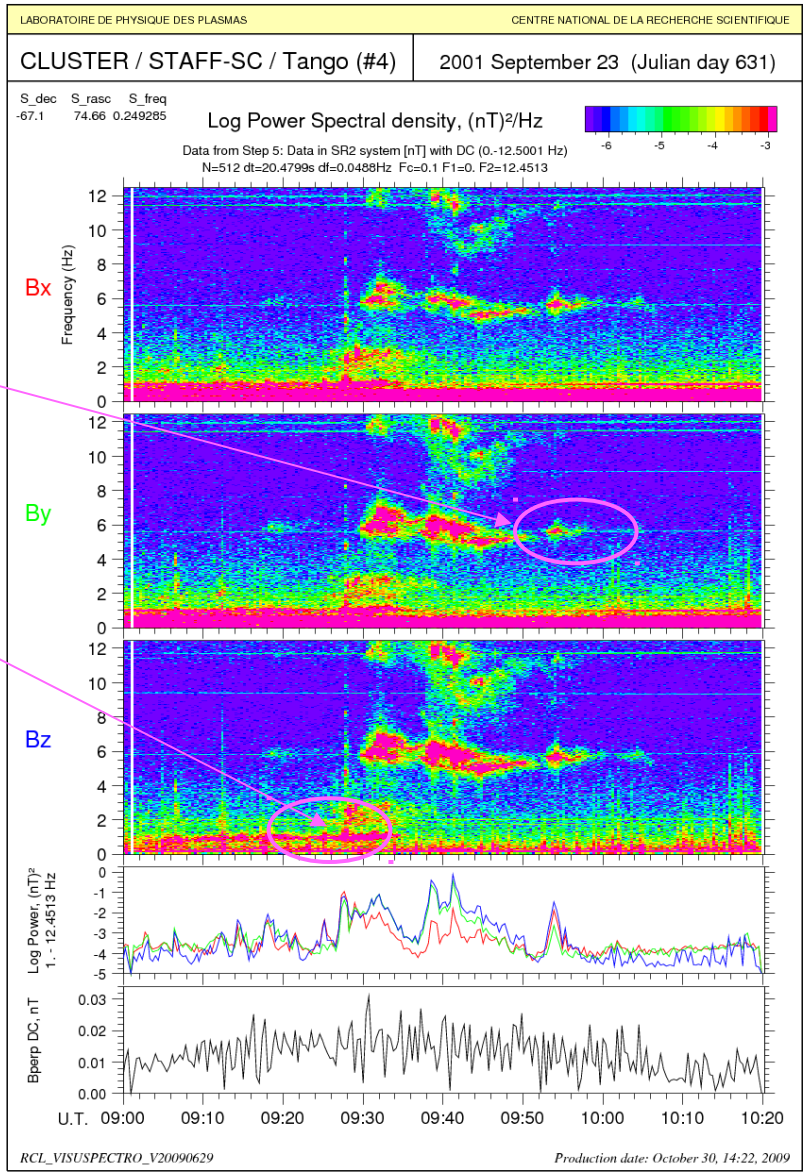
⇨ Next slides are dedicated to show last results.

Comparison between STAFF-SC CWF & FGM HR waveforms (suite)

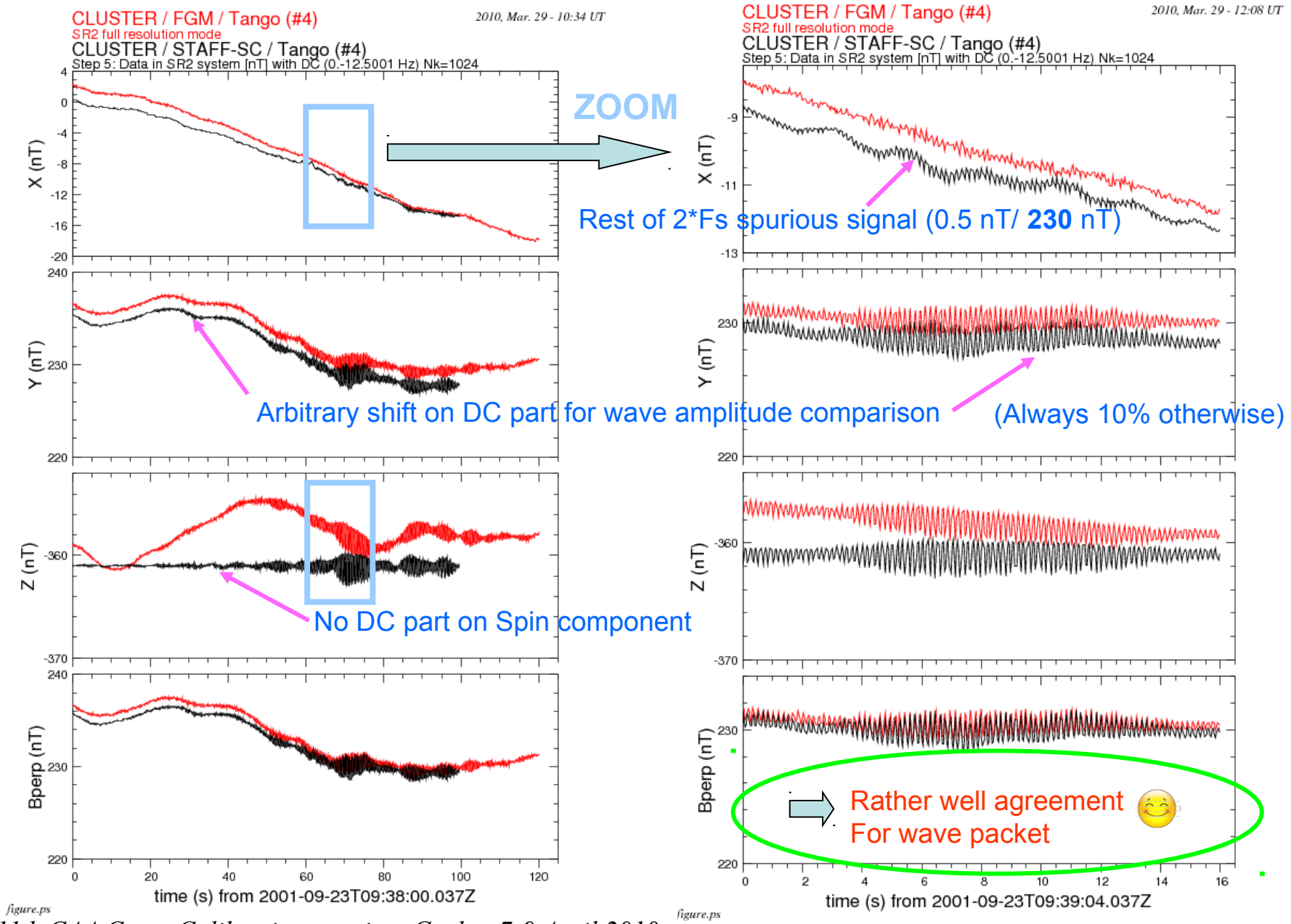
⇨ Two significant events:

1- Monochromatic wave at ~ 6 Hz

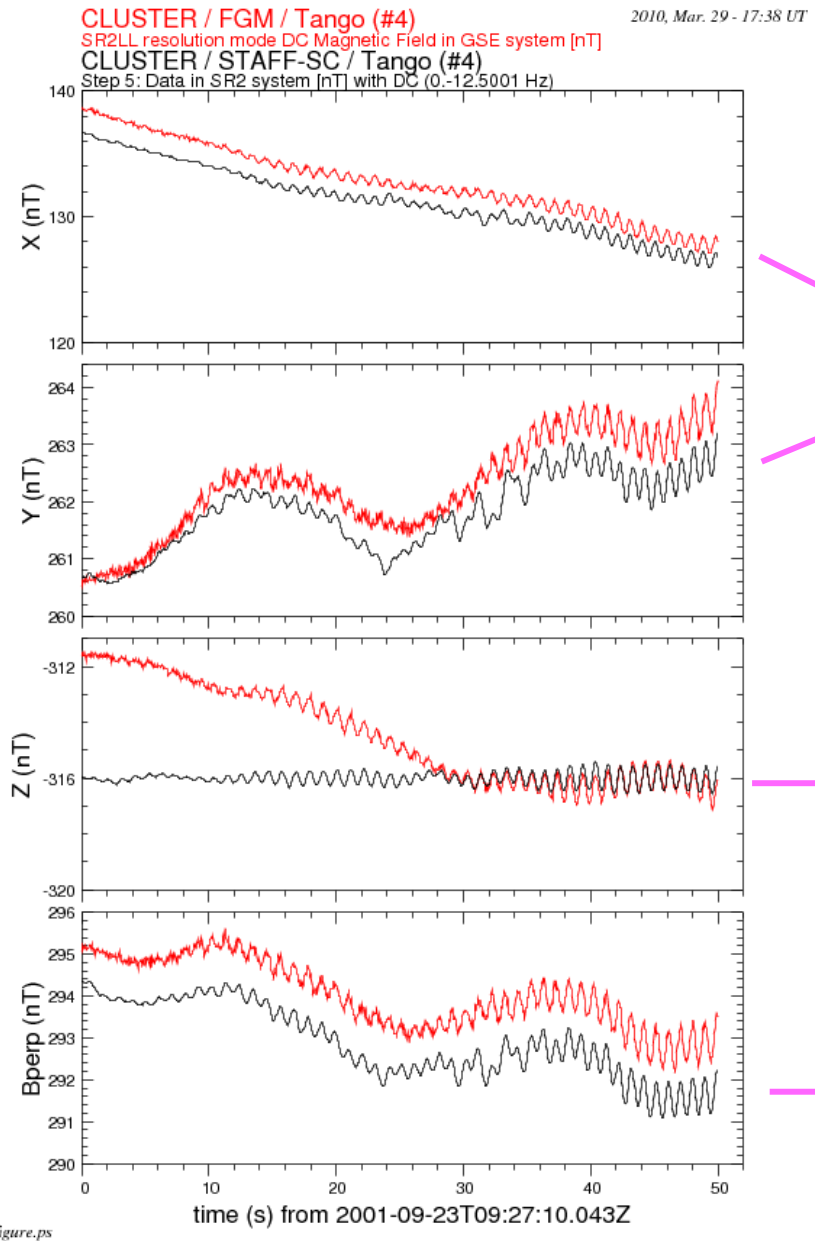
2- Monochromatic wave at ~ 1 Hz



1- Monochromatic wave at ~ 6 Hz / **SR2** coordinates



2- Monochromatic wave at ~ 1 Hz / **SR2** coordinates

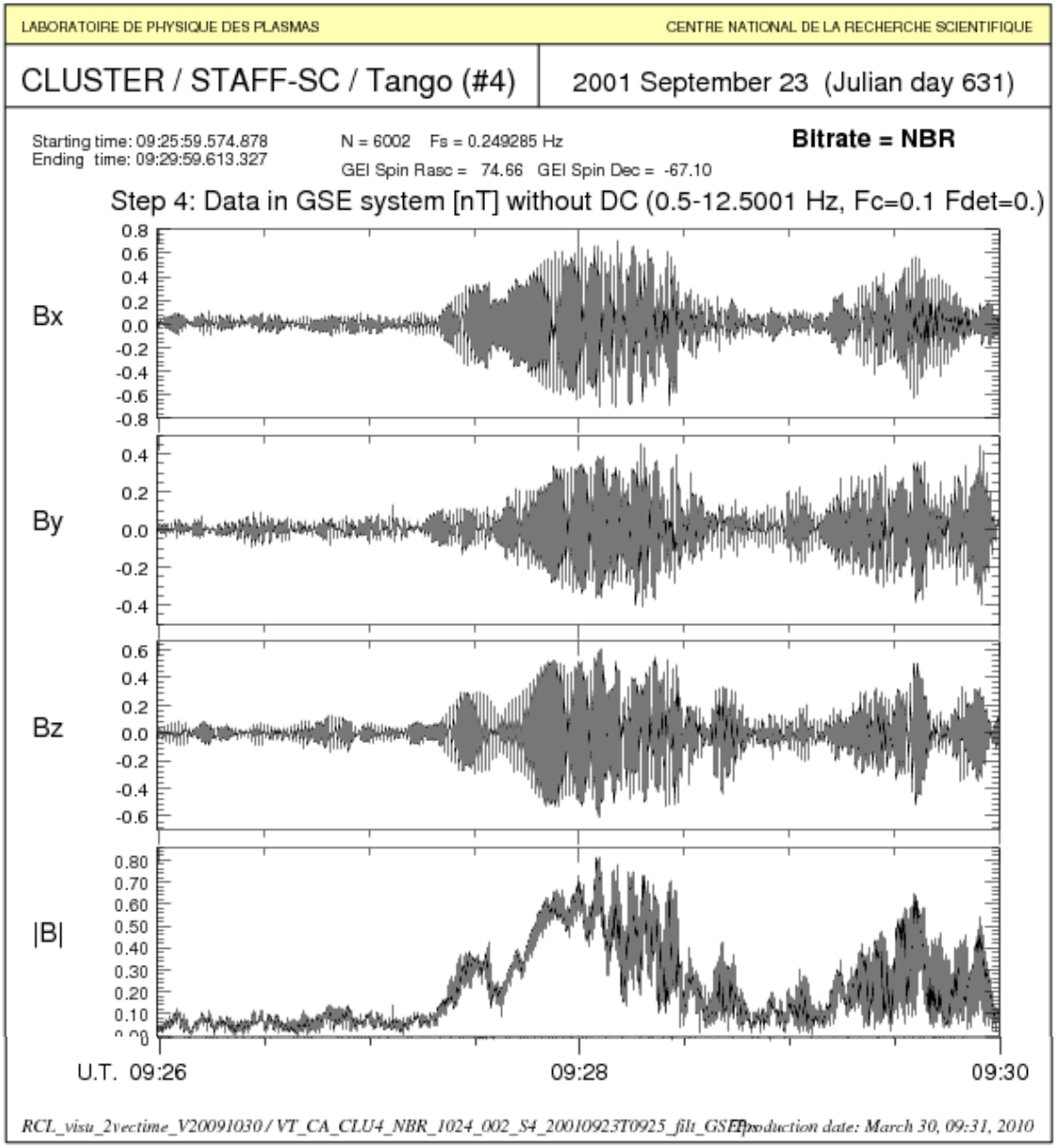


Same trend for the DC part, OK ...

Rather well agreement on Z (amplitude and phase)

Some harmonics on spin components

2- Monochromatic wave at ~ 1 Hz / **GSE** coordinates, filtered

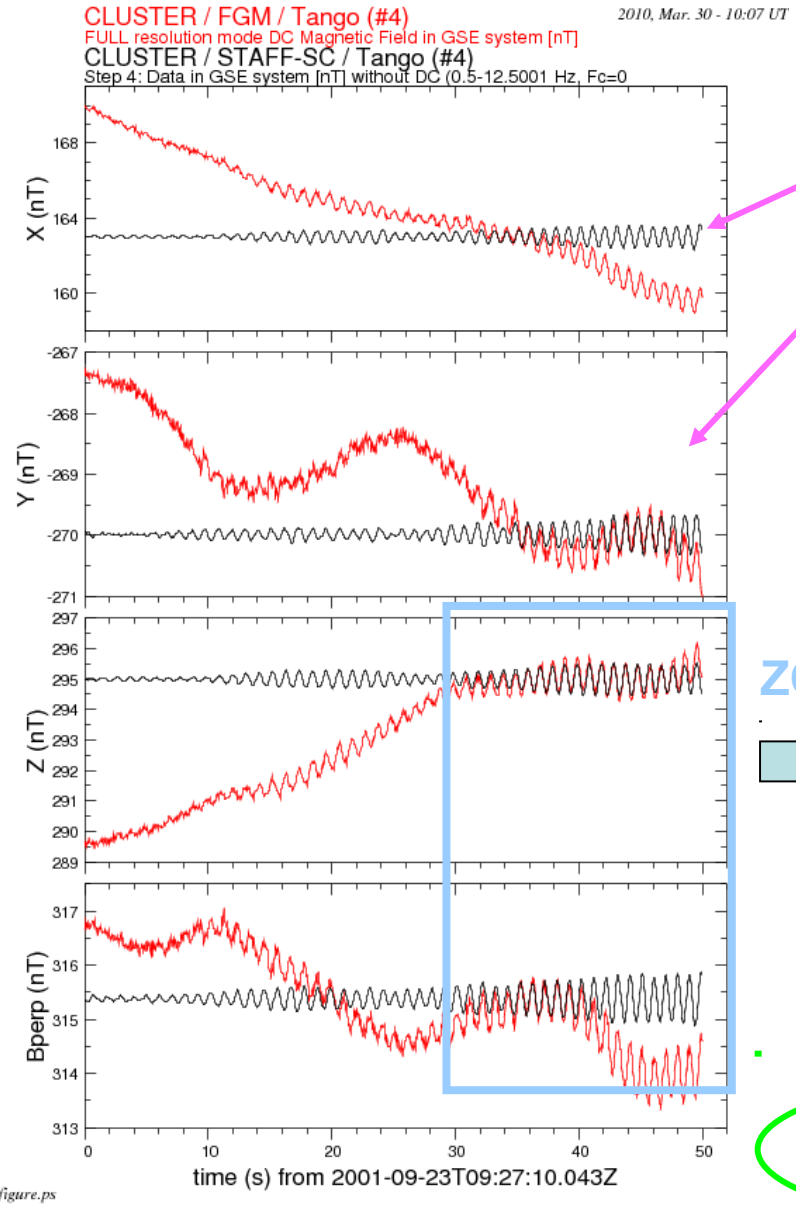


This is the future CWF product

- Filtered above 0.5 Hz
- GSE coordinates

Possibility, after that, to deliver the 2 DC spin plane components (after transfer function corrections...)

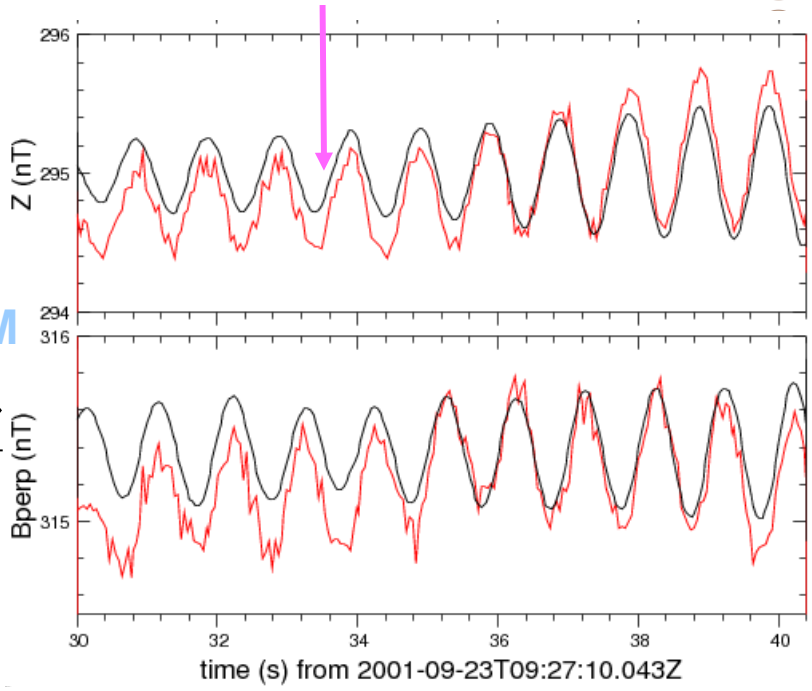
2- Monochromatic wave at ~ 1 Hz / **GSE** coordinates : FGM comparisons



- Spin harmonics disappeared
- Well agreement with FGM wave components

- Very good phase agreement
- Always 10% difference on amplitude

ZOOM



But NBR CWF production can start

5) Conclusions (a)

- LPP moving from Velizy to “Ecole Polytechnique”, in Palaiseau, at the beginning of January 2010, has induced many troubles in computer management (system upgrade delayed, low network, disk extension required …).
- Some details remain to be done to finish CWF software before mass processing (saturation checks, data gaps management....) but nothing crucial
- Comparison of filtered CWF product with FGM data is satisfactory.
  Even if transfer function correction remains to be done, **production can start**.

- CCM software is high CPU time consuming:
  Ex.: For Nshift=2 (best quality) ⇒ 20 mn for 3h in NBR, ~ 3h/days.
  Possible optimization of the code currently studied. Hope improvement.

5) Conclusions (2)

⇨ Don't forget: always to be done:

- Sensitivity, noise instrument, minimum signal recordable versus frequency etc… have to be defined accurately (already planned action).
- Cross calibration between STAFF-SC/HBR and STAFF-SA must be refreshed after STAFF-SC **transfer function correction**.
- Continuity of sensitivity, noise instrument etc… must be checked between STAFF-SC and STAFF-SA. Hope available manpower...

⇨ All spectrogram plots of STAFF-SC available on LPP web site (free access)
http://cluster.lpp.polytechnique.fr/staff/N2nbr/main2009.html

http://cluster.lpp.polytechnique.fr ressources / bases de données / Mission Cluster

- THANK YOU -