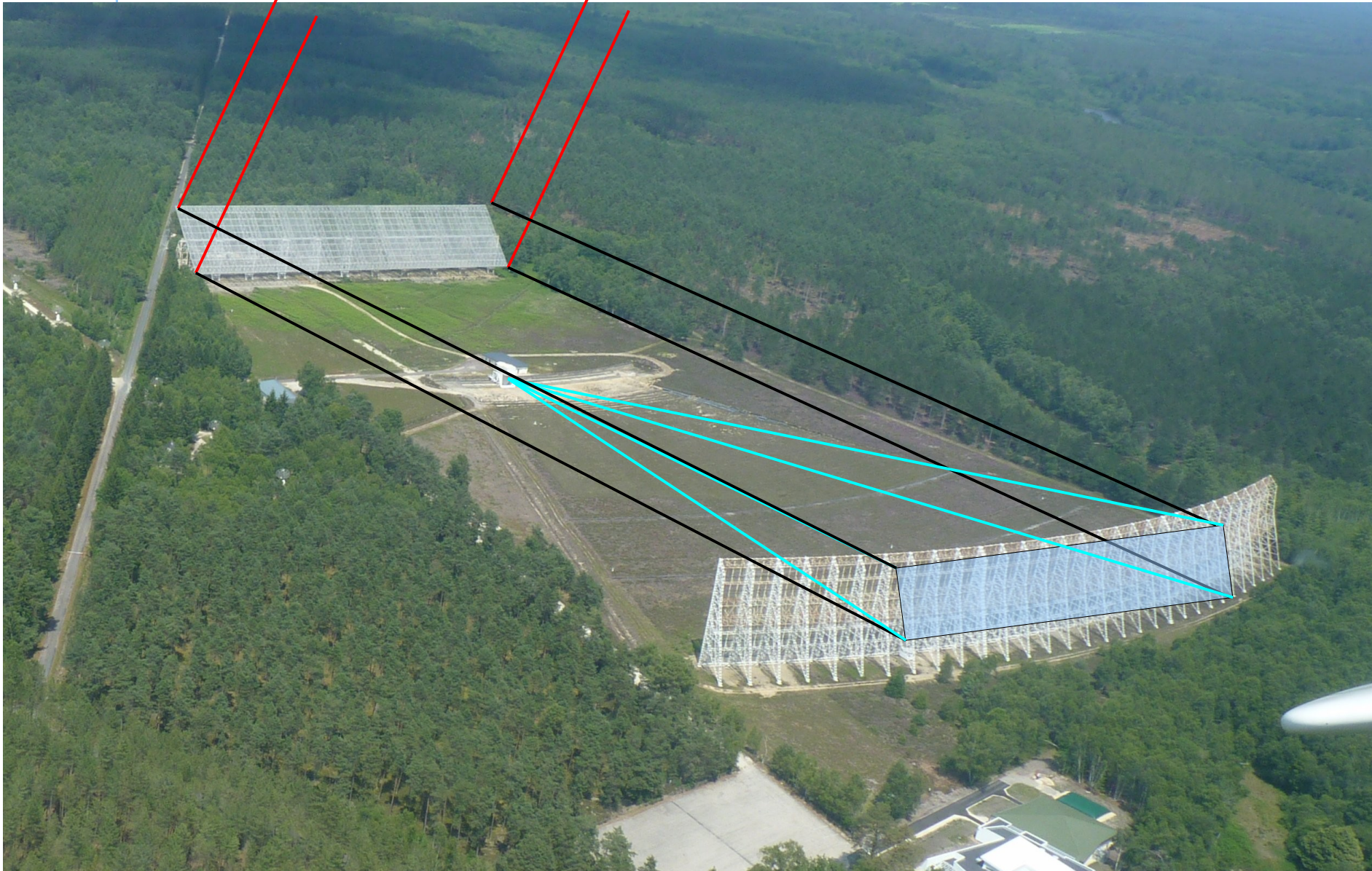


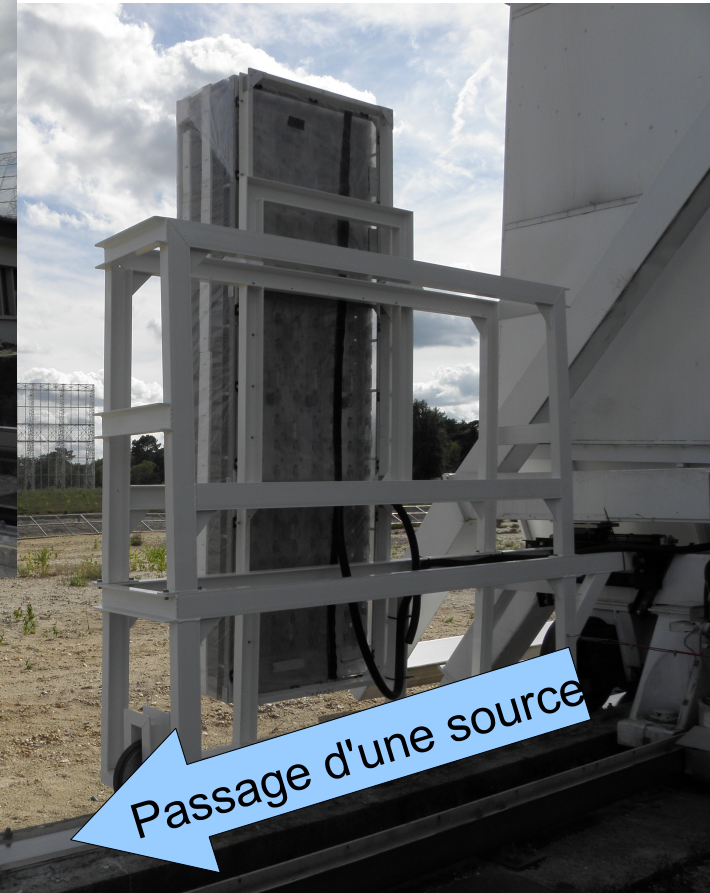
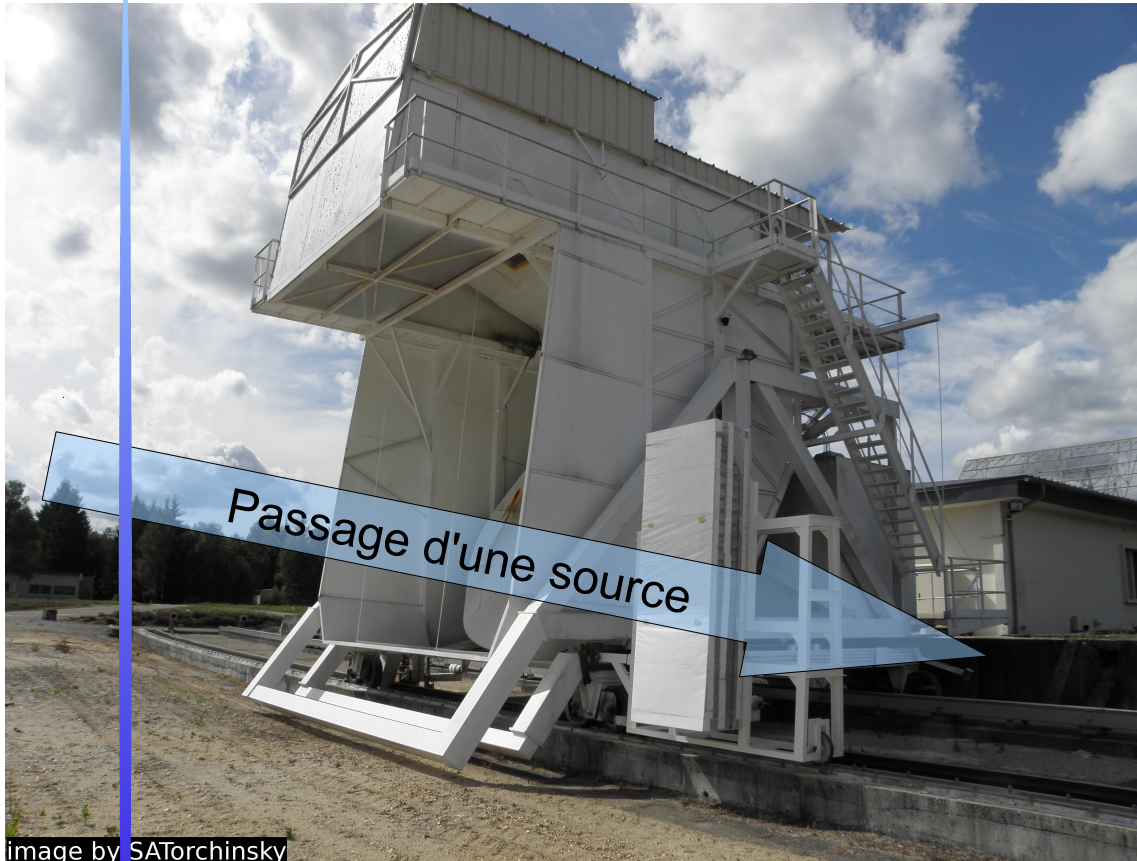
FAN

Focal Array @ Nançay

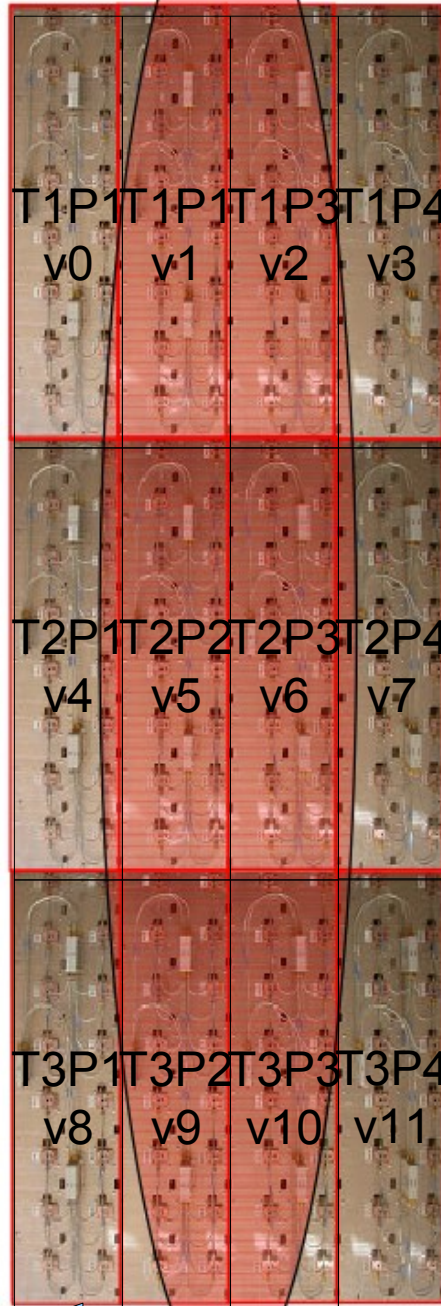
Jacques Pezzani
Cedric Viou

STATION DE RADIOASTRONOMIE
DE NANCAY
Observatoire de Paris /CNRS-INSU
CNRS B704
www.obs-nancay.fr

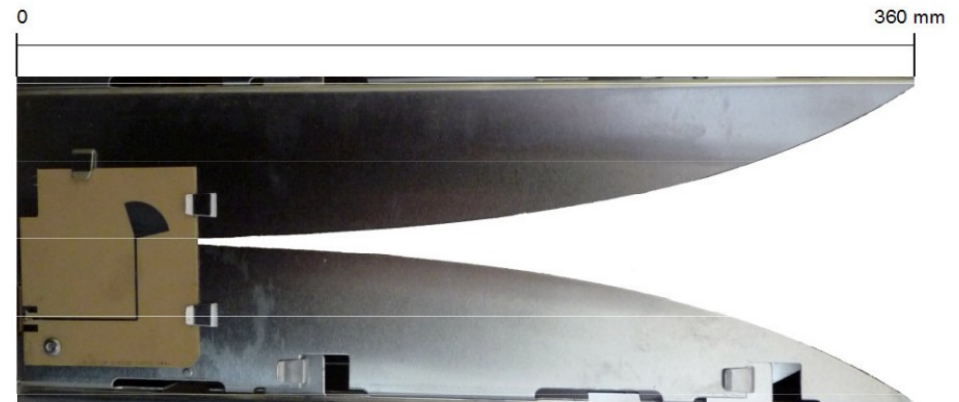




Pixels



- Lobe à 1400 MHz
- 12 voies
- 8x2 Vivaldis



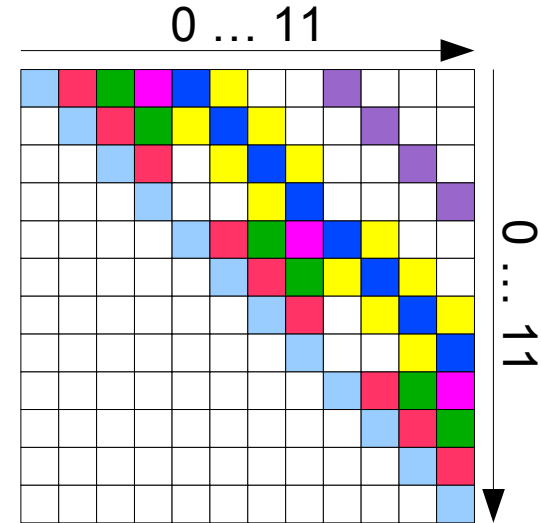
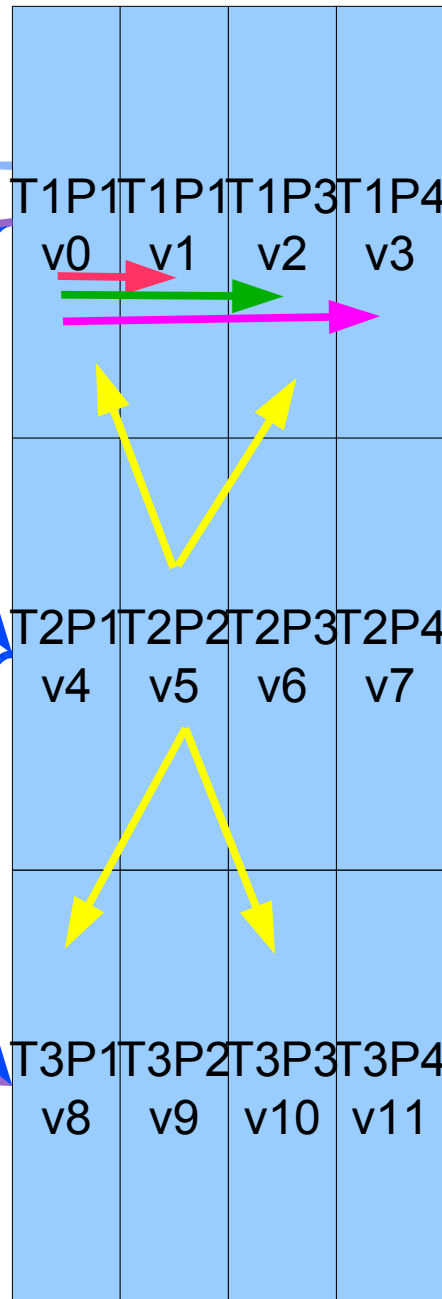
4

Vu de dos ← Passage d'une source

Beamforming

- Front d'onde plan transformé en tache de diffraction par le réflecteur
- Corrections gain/phase pour chaque pixel
- Puis sommation pour synthétiser un beam

- Quelles corrections?
 - Calibration sur source forte, ponctuelle, à l'infini
 - Mesure des rapports de gains et déphasage par **corrélation**

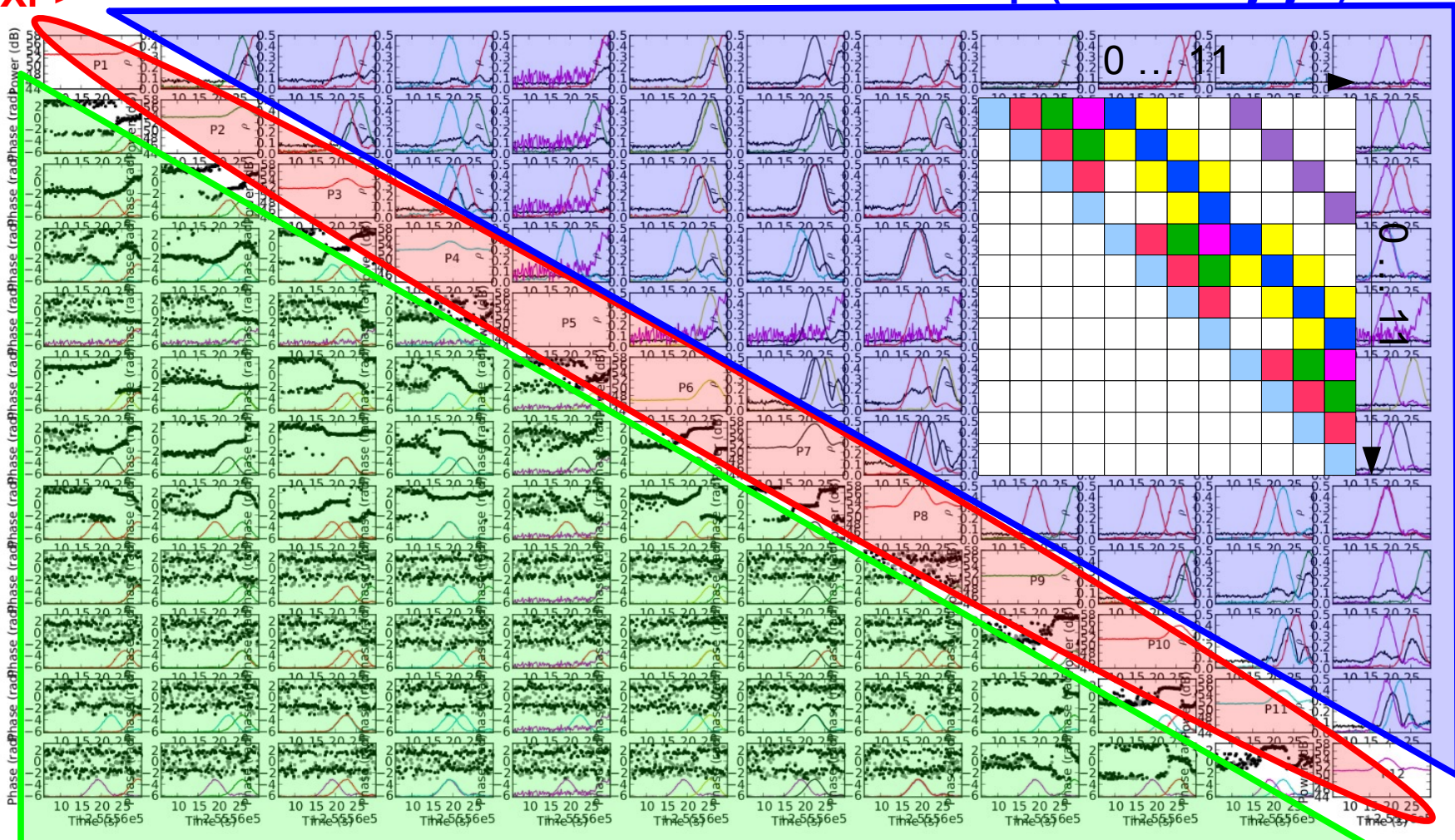


- 12 auto-corrélations réelles
66 cross-corrélations complexes dont:
- 17 d'ordre 1
 - 12 d'ordre 1.5
 - 10 d'ordre 2
 - 27 d'ordre supérieur

Affichage des corrélations

$\langle X_i X_i^* \rangle$

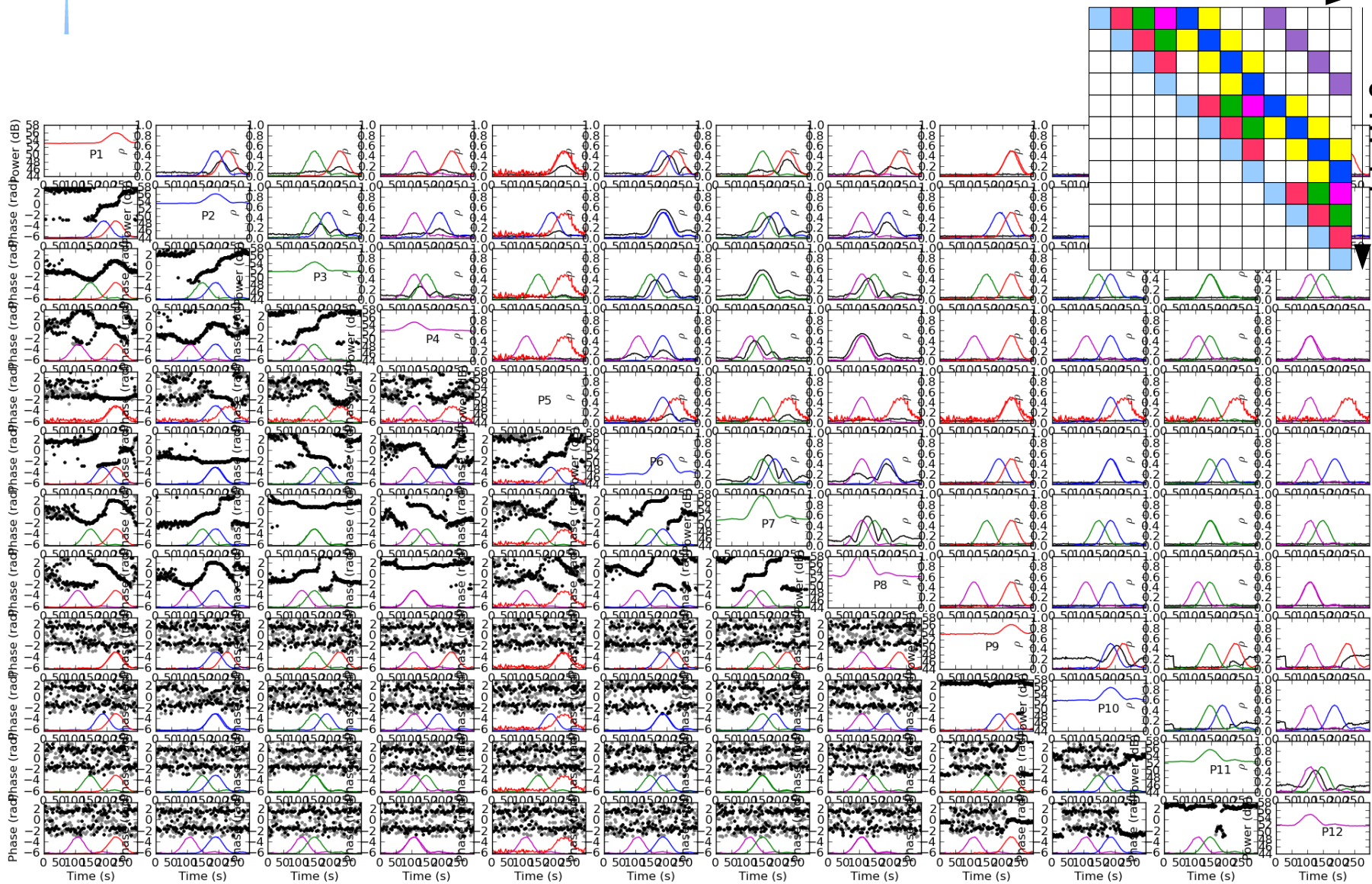
$$0 < \frac{|\langle X_i X_j^* \rangle|}{\sqrt{\langle X_i X_i^* \rangle \langle X_j X_j^* \rangle}} < 1$$



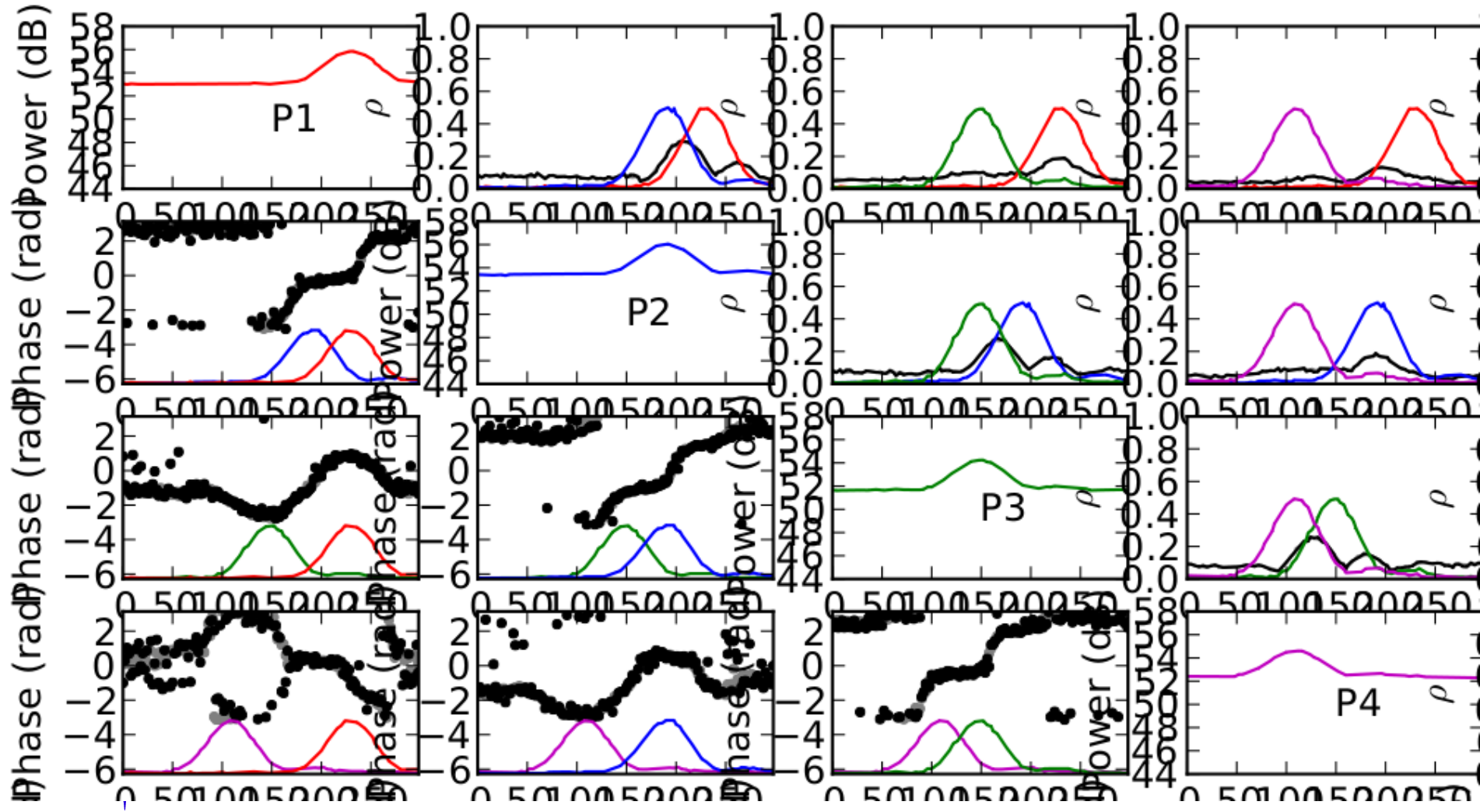
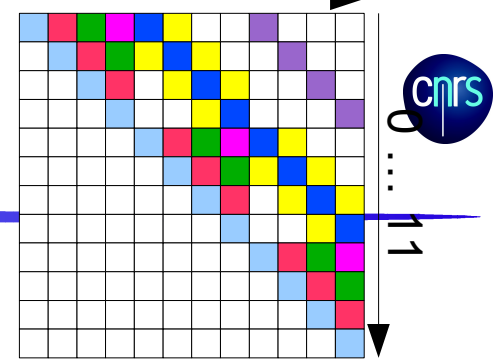
$\text{angle}(\langle X_i X_j^* \rangle)$

ADC1 – ADC2 - ADC3

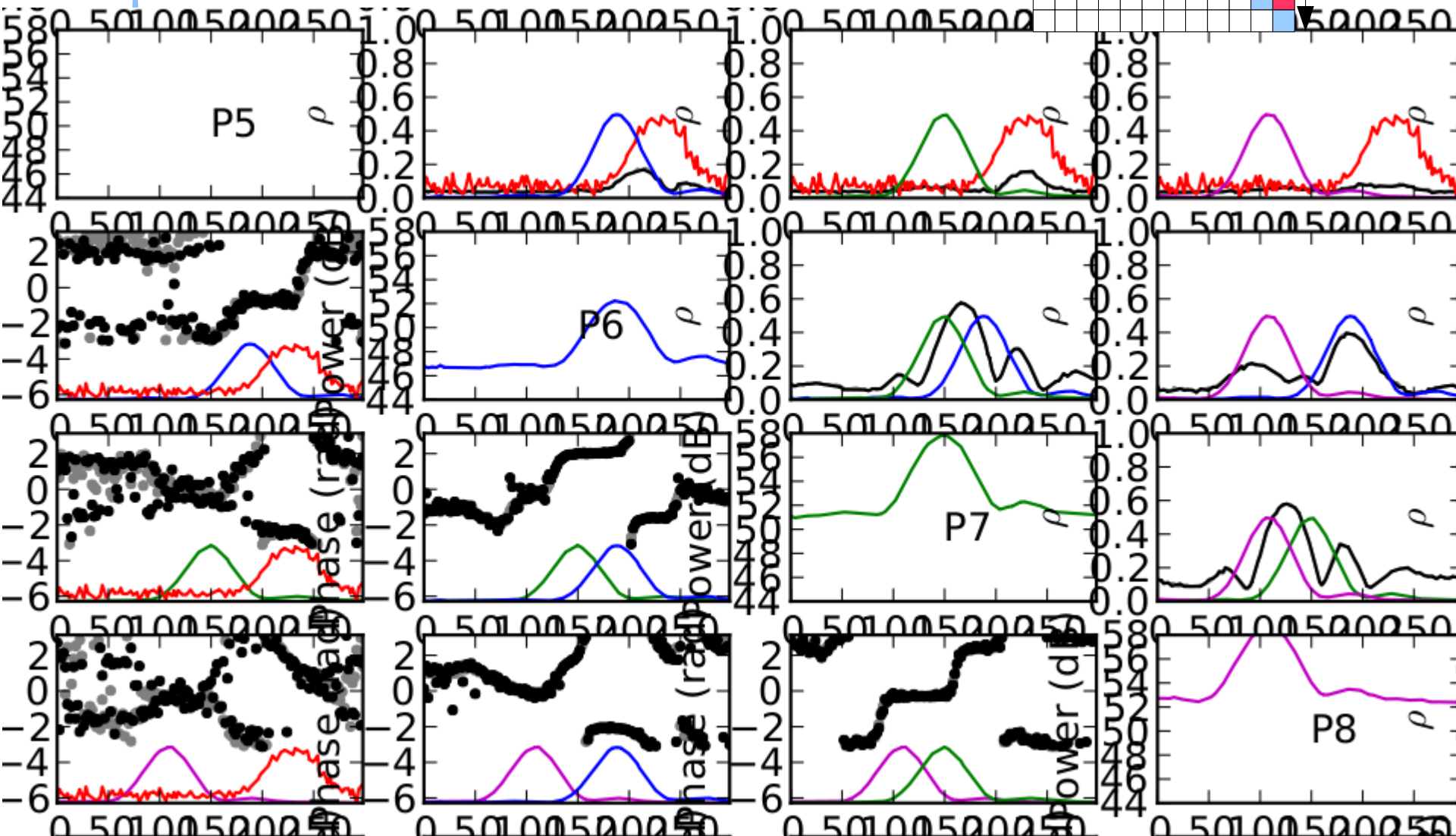
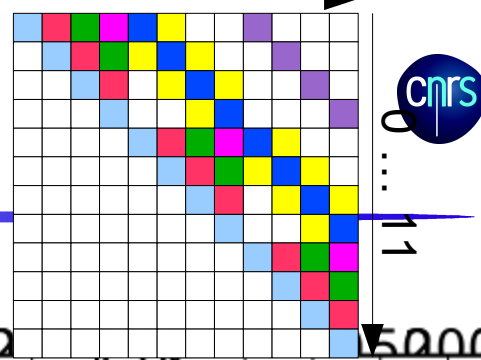
0 ... 11



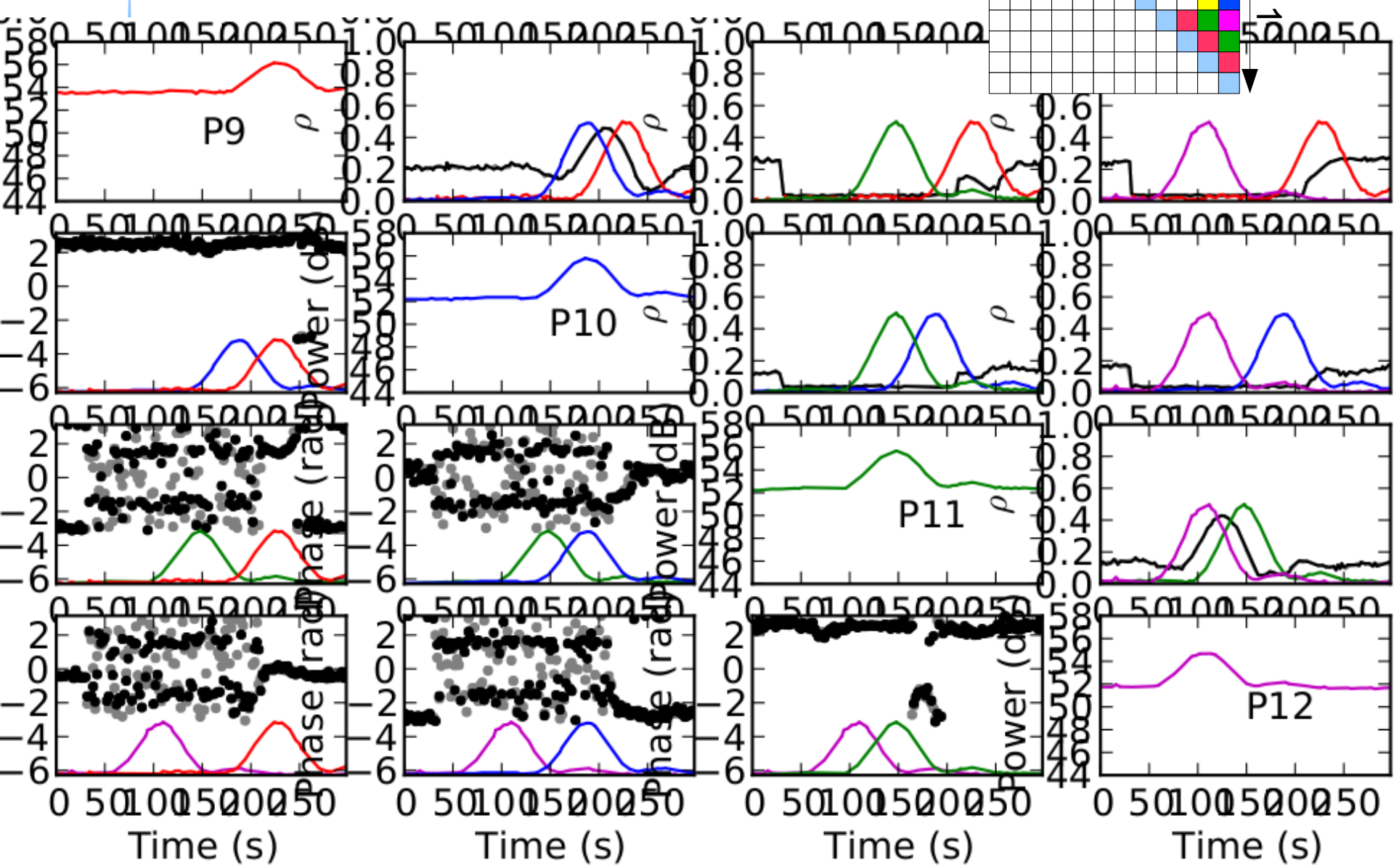
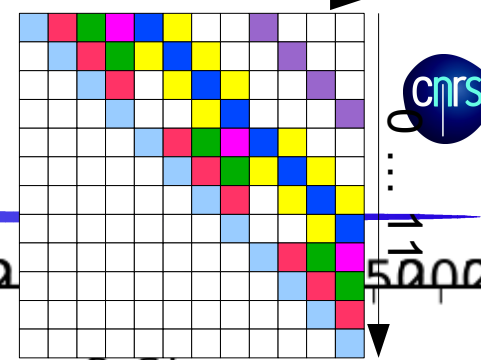
ADC1



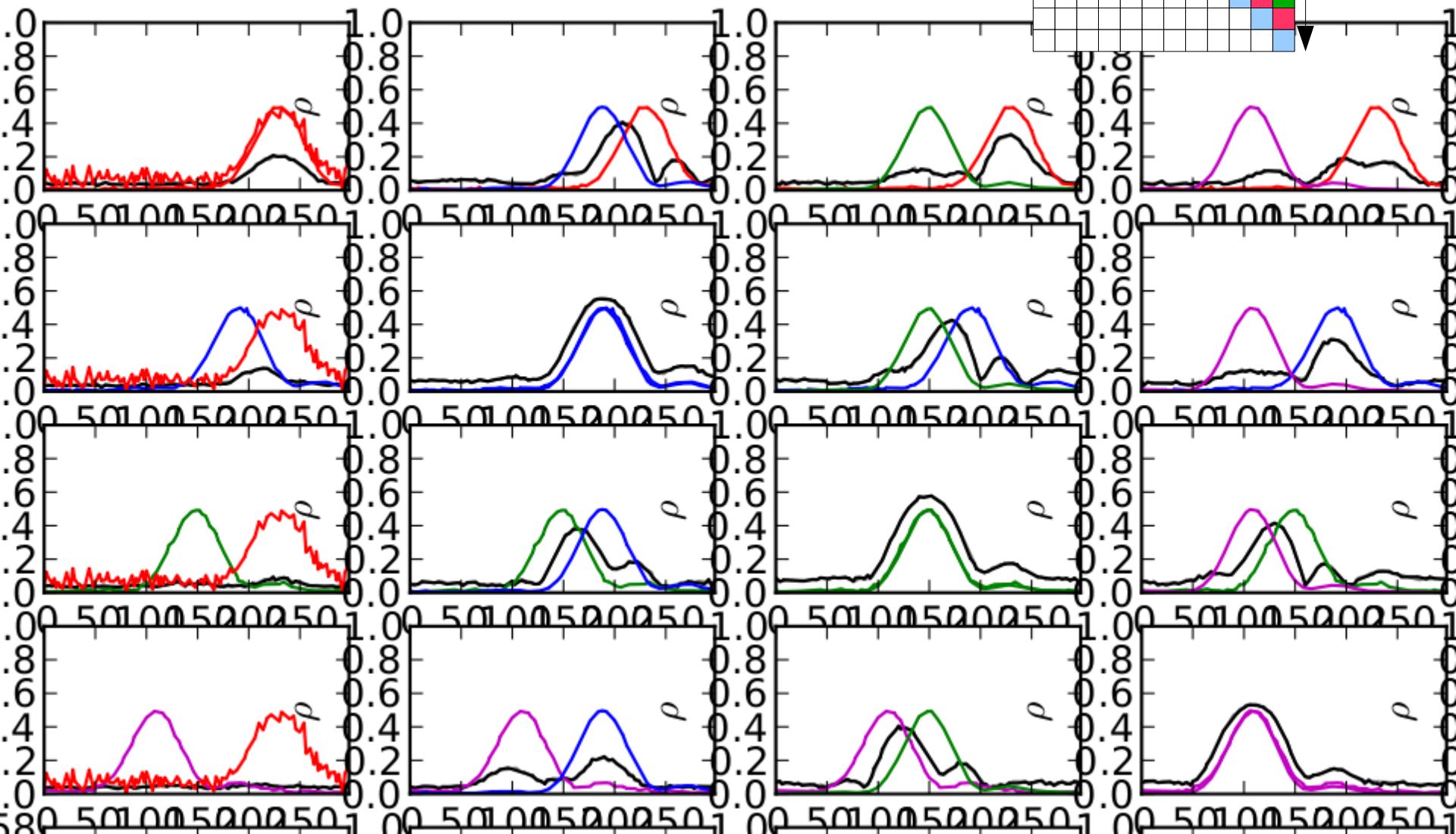
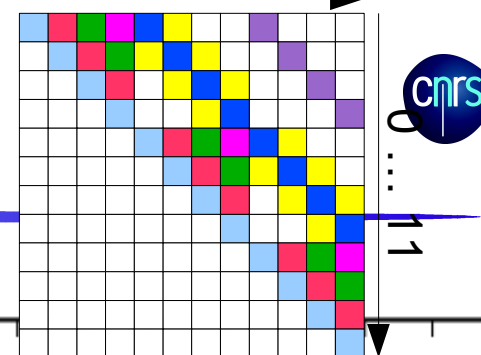
ADC2



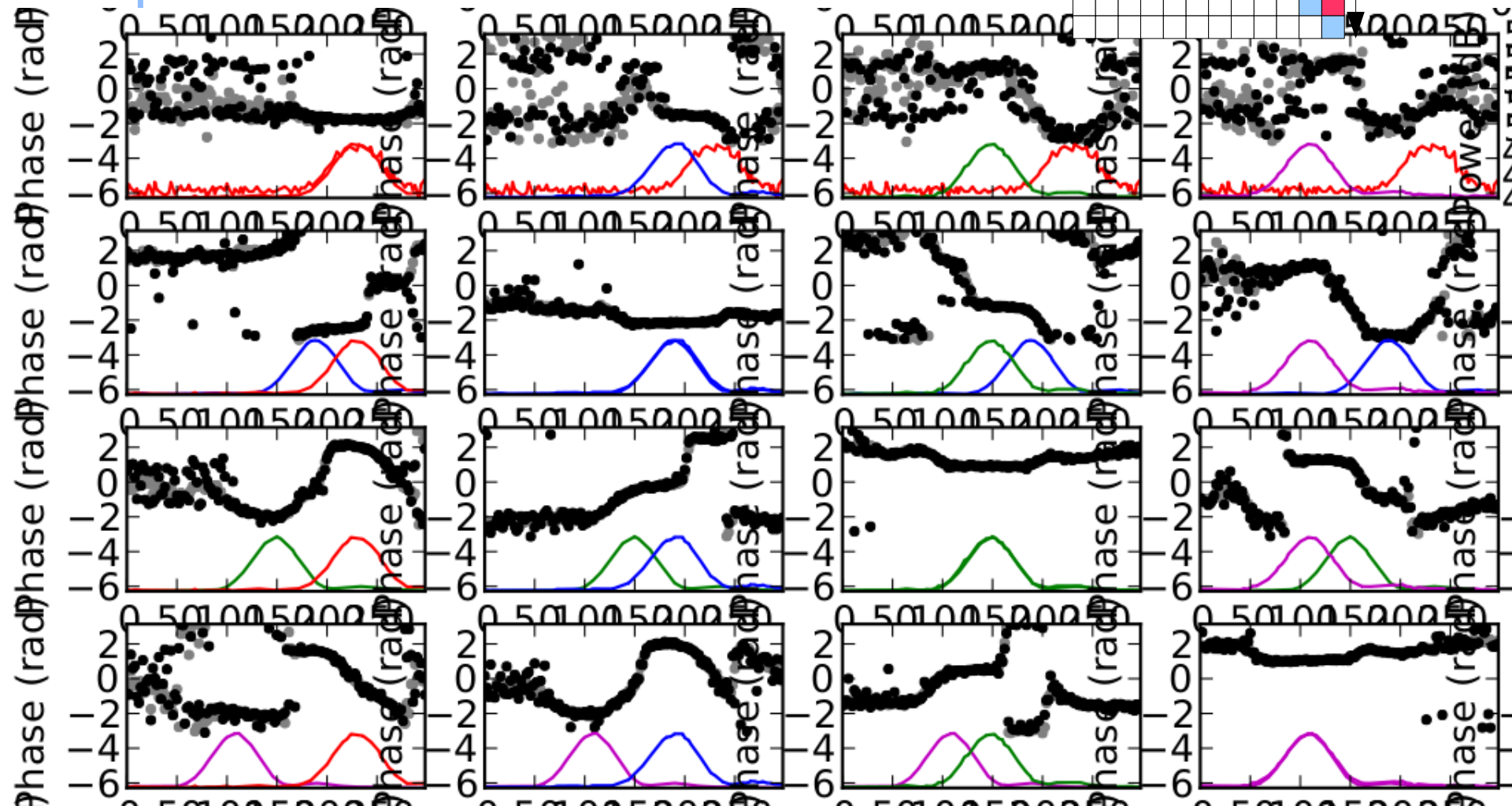
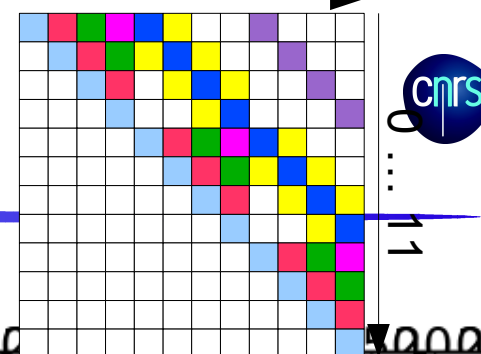
ADC3



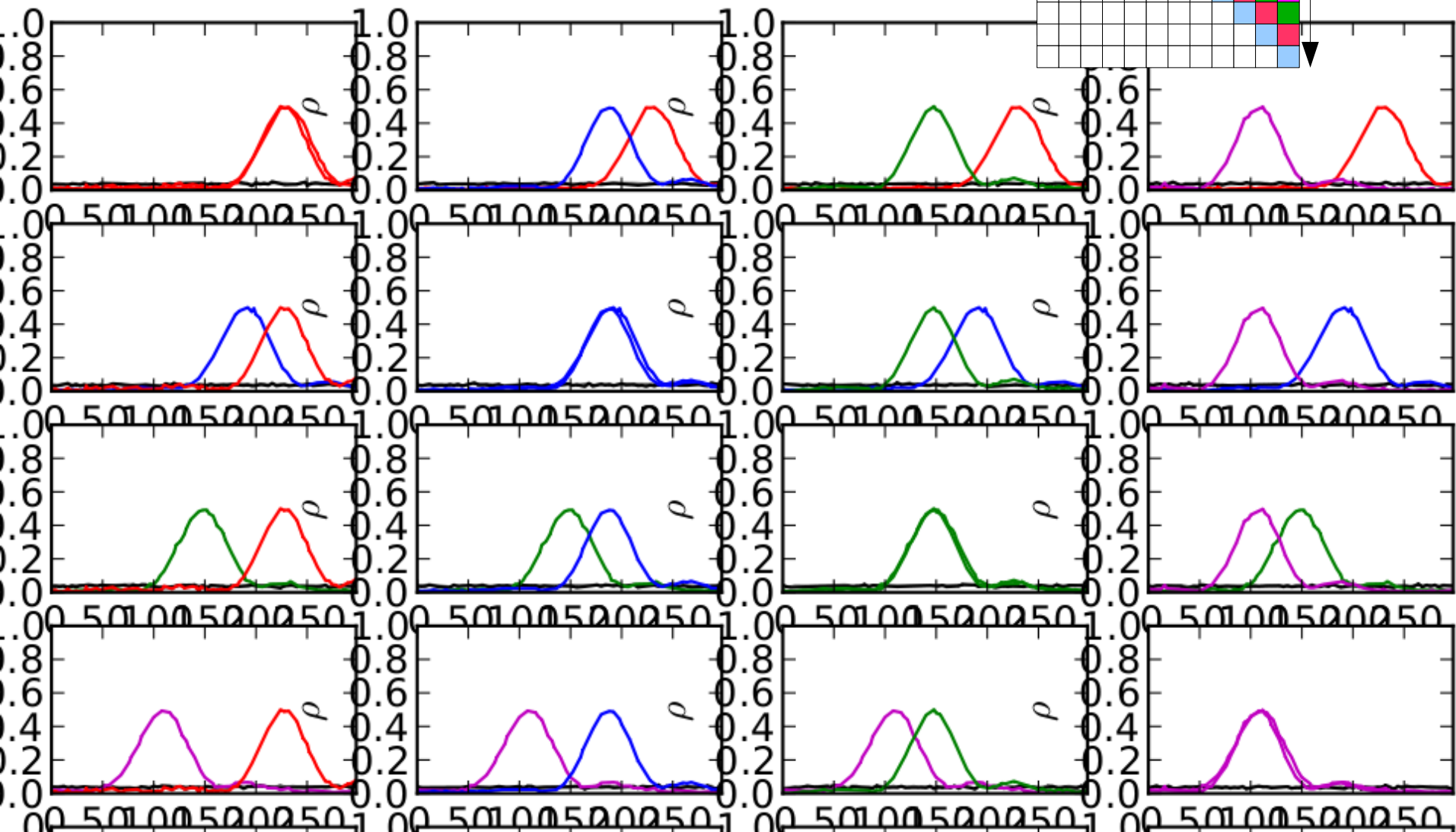
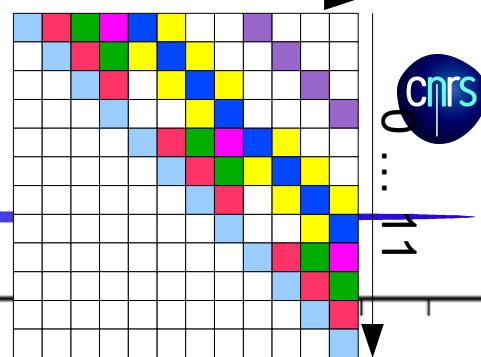
ADC1 - ADC2



ADC1 - ADC2



ADC1 - ADC3



Futur

- Obtenir la corrélation sur 12 voies sur une source
 - Diode à bruit OK
 - CasA hier soir => à dépouiller
- Extraire les gains/phases relatifs
- Étudier leur stabilité (alt,az,t)
- Beamformer une source forte
- Beamformer une source faible