

**Properties of WMAP cross-  
sections in the field of the  
RATAN-600 survey**

*M.L.Khabibullina, SAO*

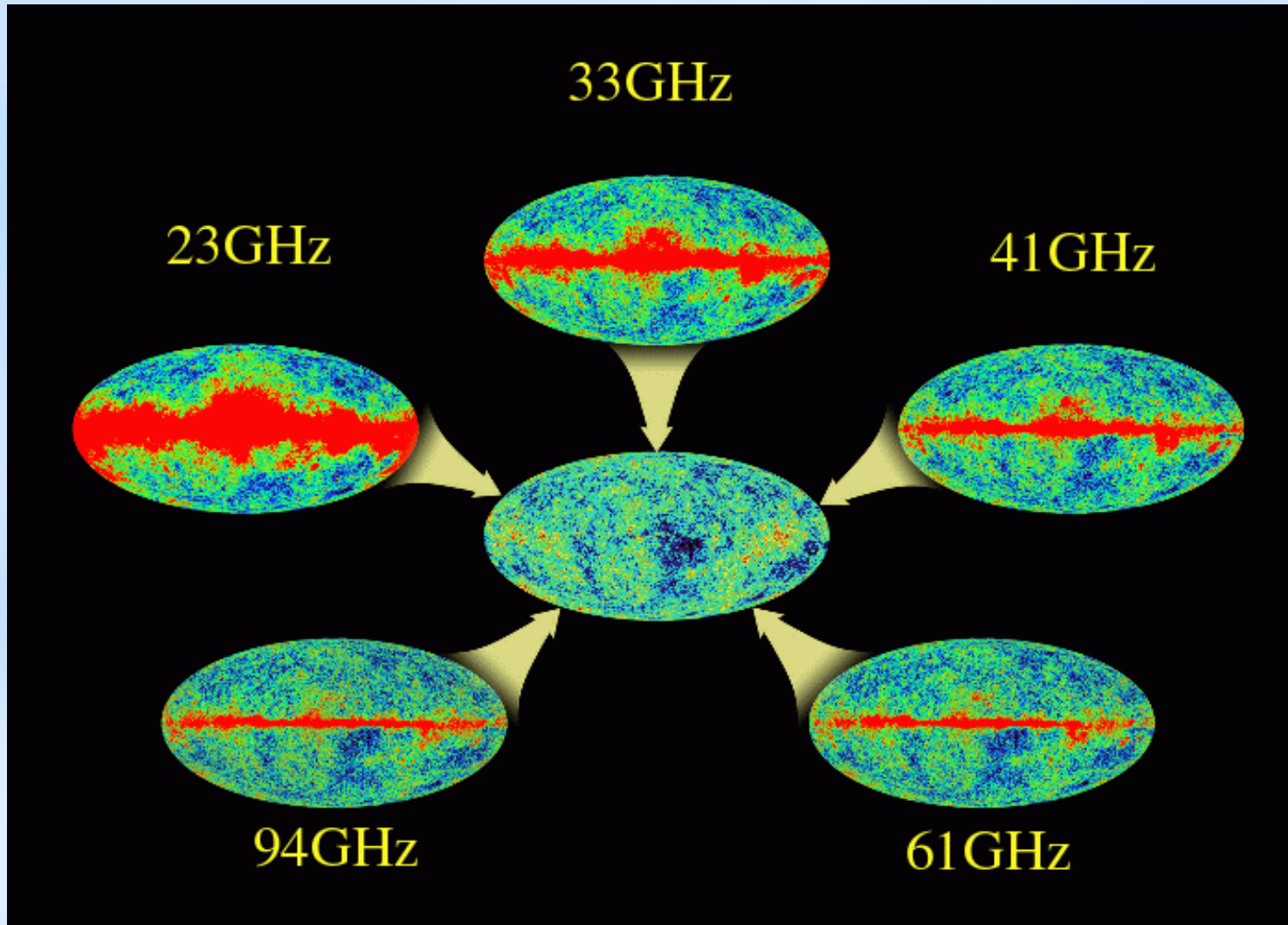
# ИССЛЕДОВАНИЕ ОДНОМЕРНЫХ СЕЧЕНИЙ КАРТ WMAR И NVSS

Хабибуллина М.Л., Верходанов О.В., Майорова Е.К.,  
Парийский Ю.Н.

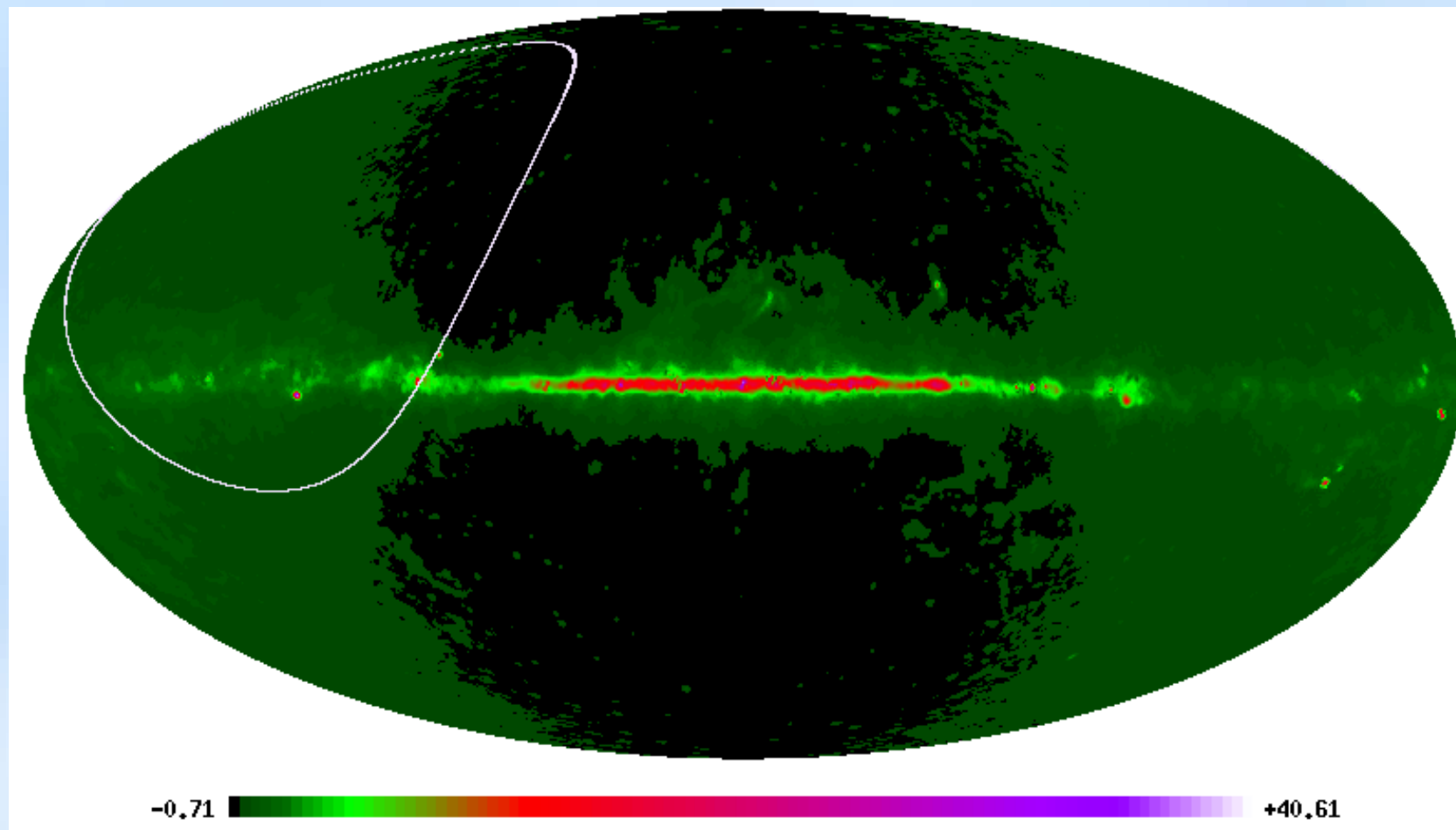
Two stages of our correlation researches are considered

1. Study of correlation of 1-dim sections of CMB and FGDs
2. Study of correlation of 1-dim sections of CMB and NVSS

# Component separation for production of ILC CMB map



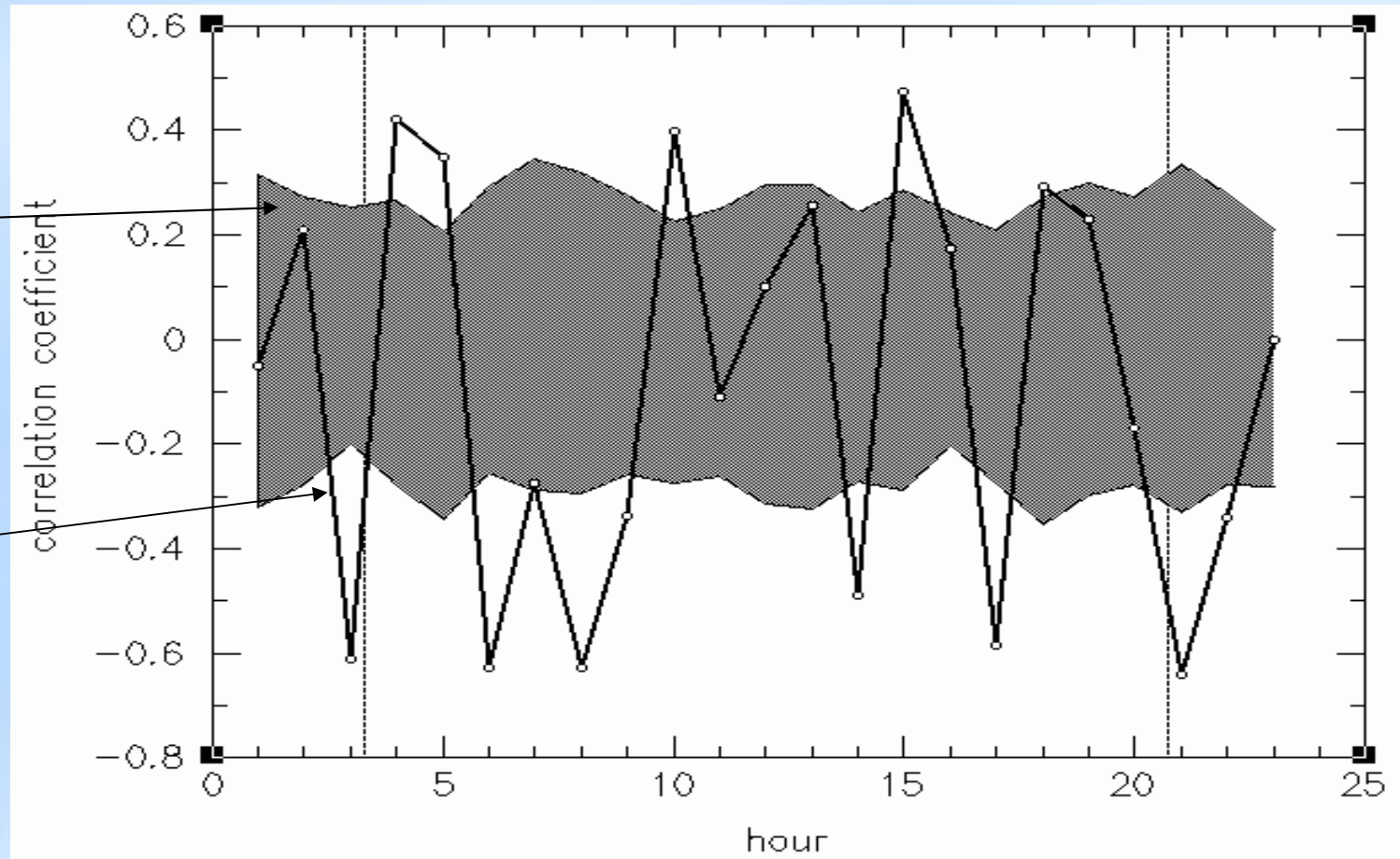
RZF (RATAN-600 Zenith Field) survey (the white ring strip,  $\delta \sim 41^\circ$ ) on the synchrotron map in Galactic coordinates



# *The correlation coefficients for synchrotron* for 1-hour bins

Model of  $\Lambda$ CDM with  
admissible levels of  
variation

ILC

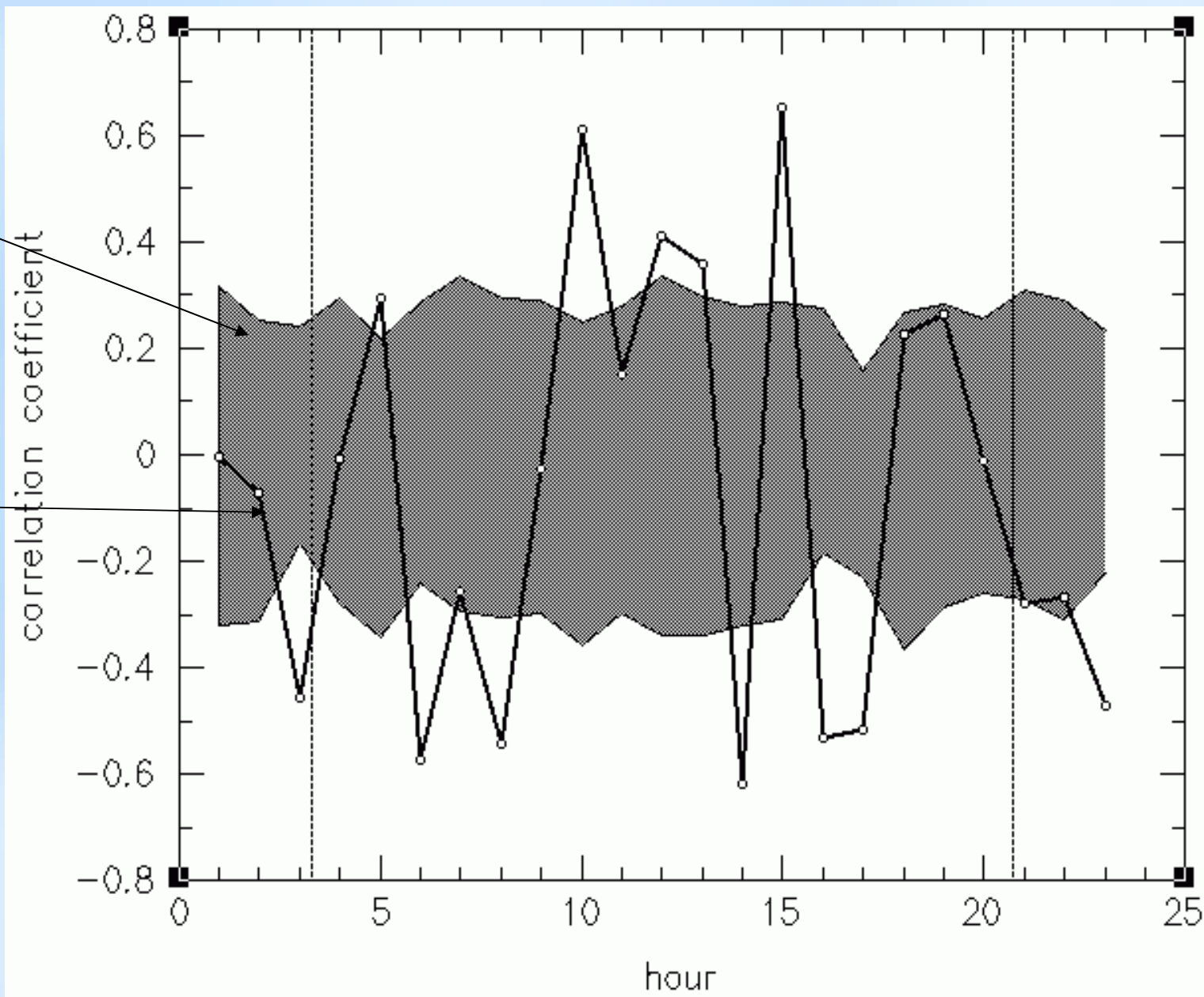


The thick vertical line shows the intersection with the Milky Way. The solid line shows the correlation between the ILC and the corresponding background component. To estimate admissible interval of cross-correlation coefficient value, we simulated 100 LSDM models. This is shown with grey colour.

# The correlation coefficients for free-free radiation for 1-hour bins

Model of  $\Lambda$ CDM with  
admissible levels of  
a variation

ILC

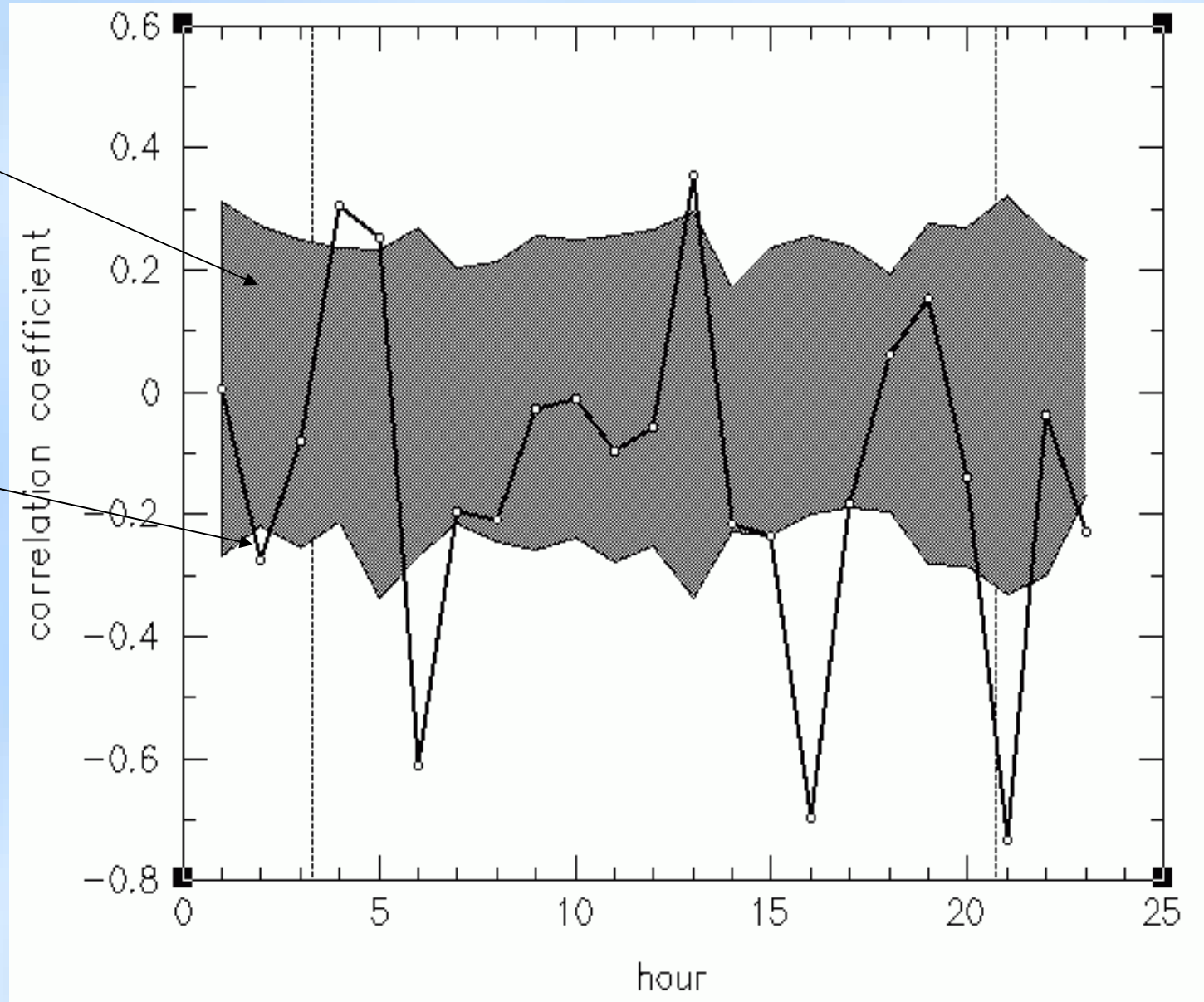




# The correlation coefficients for dust for 1-hour bins

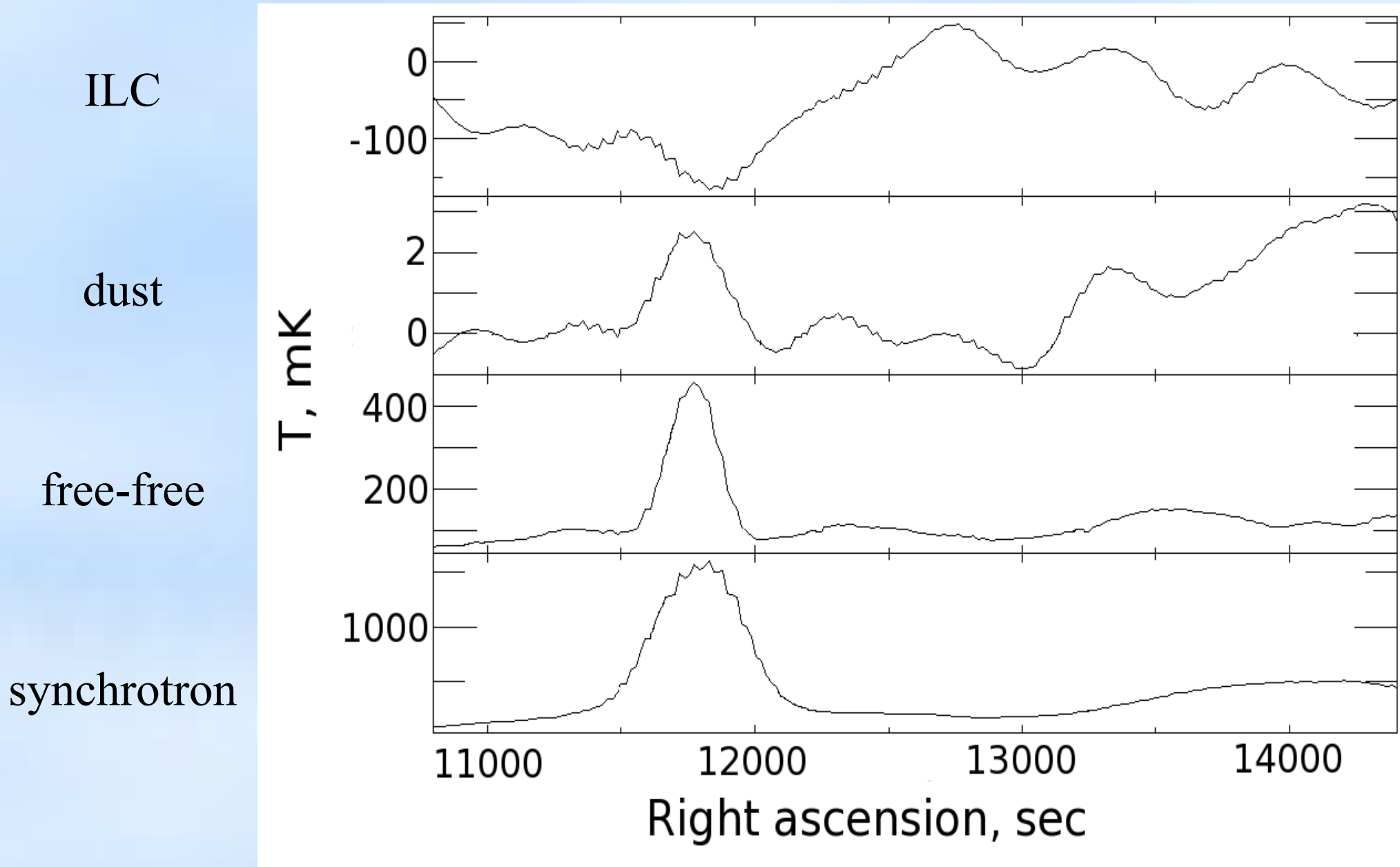
Model of  $\Lambda$ CDM with  
admissible levels of  
variation

ILC





Section of the studied field located in the Galactic plane (maximal peak in 3 lower figures)

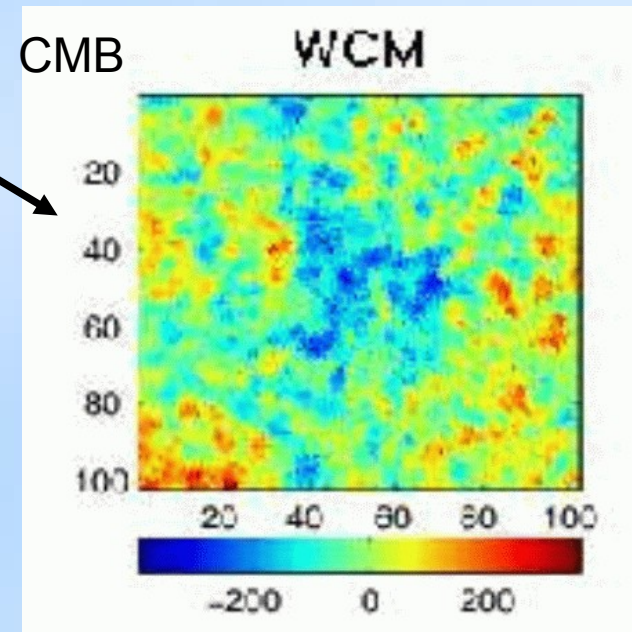
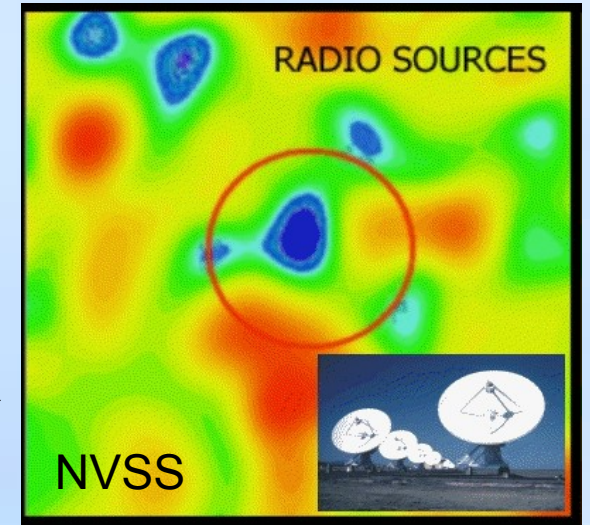
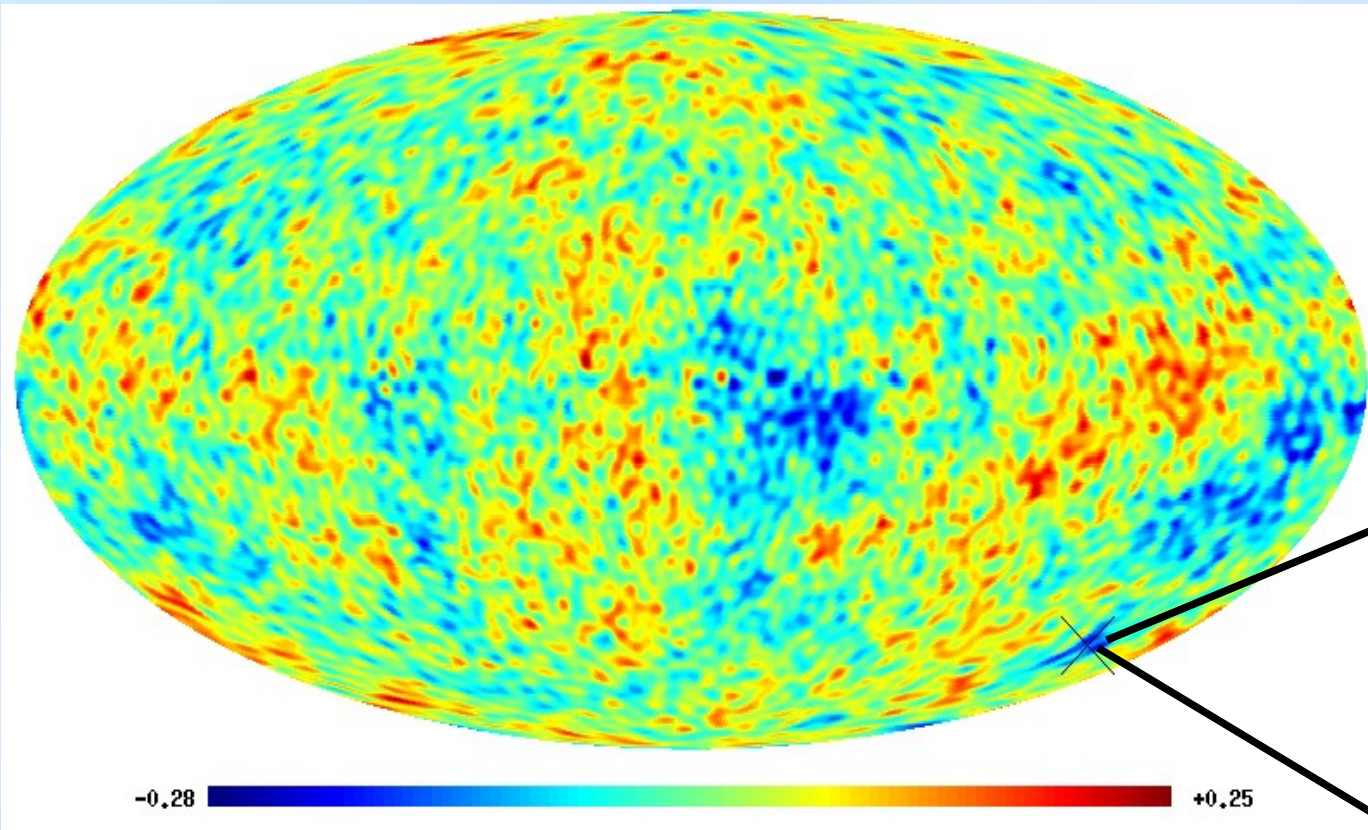


Two stages of our correlation researches are considered

1. Study of correlation of 1-dim sections of CMB and FGDs

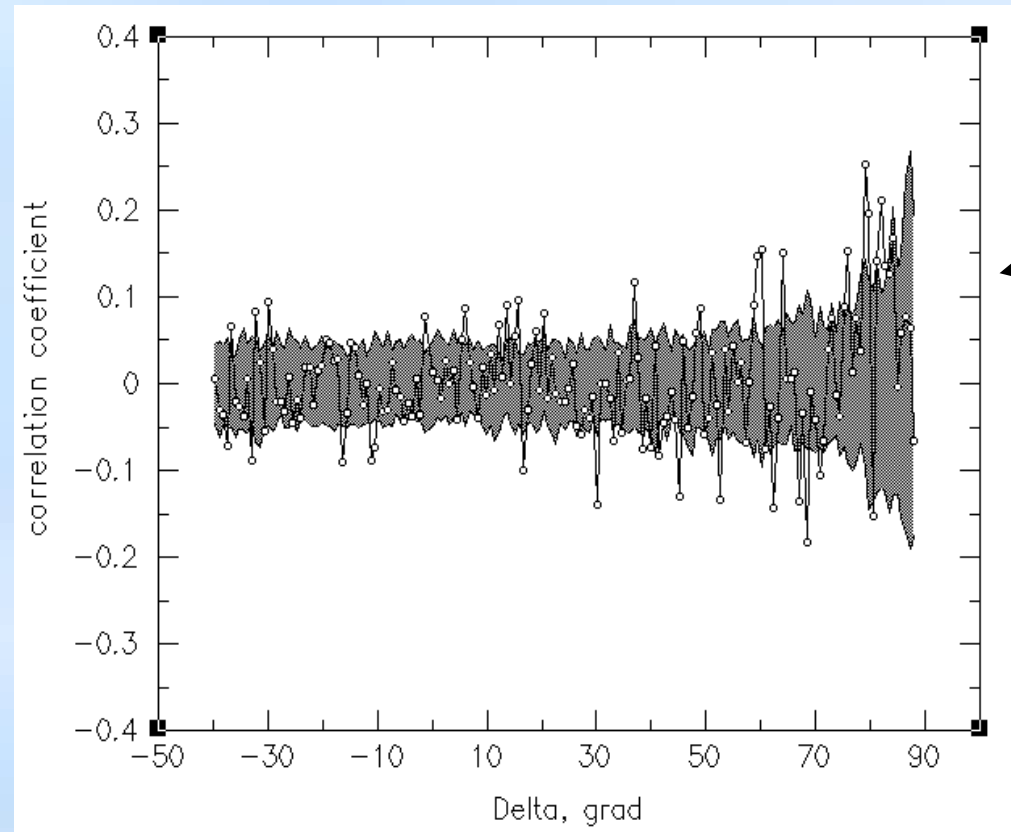
2. Study of correlation of 1-dim sections of CMB and NVSS

# Cold Spot in CMB and NVSS

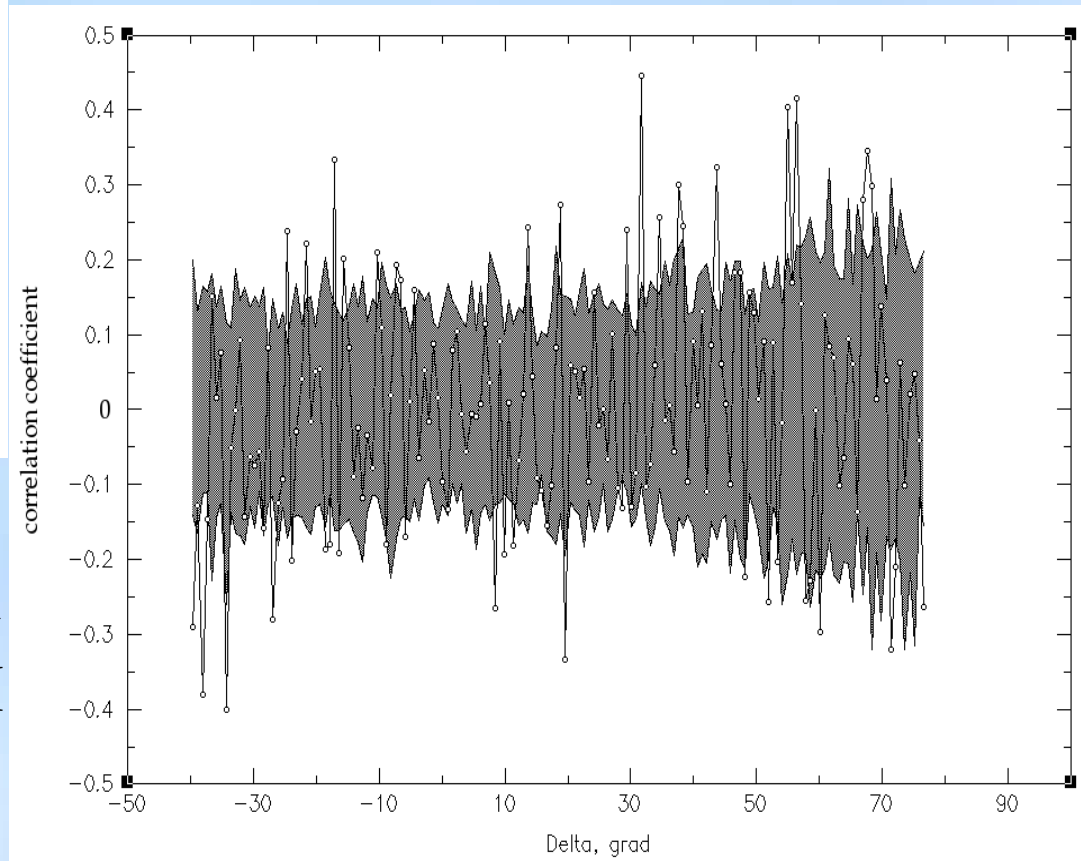


*Rudnick et al., 2007*

We divided the ILC map with sections of different resolutions at scales of 0.75, 3, 4.5, 6.75 and 9.75 degrees.

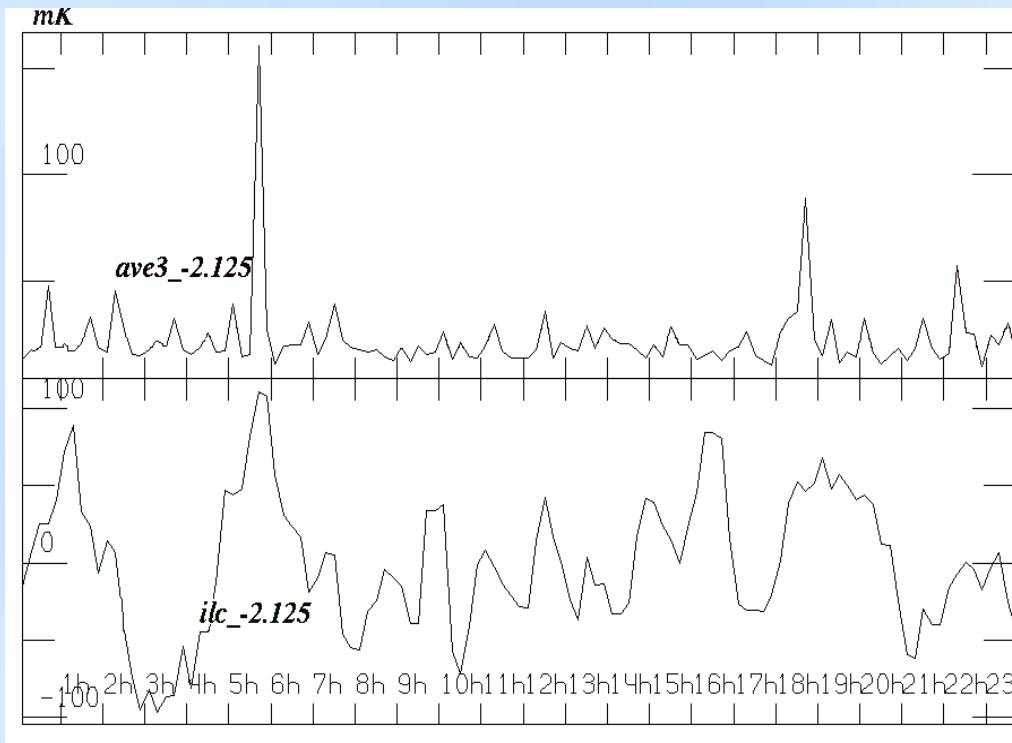


**For scales 0.75  
and 6.75 grad**



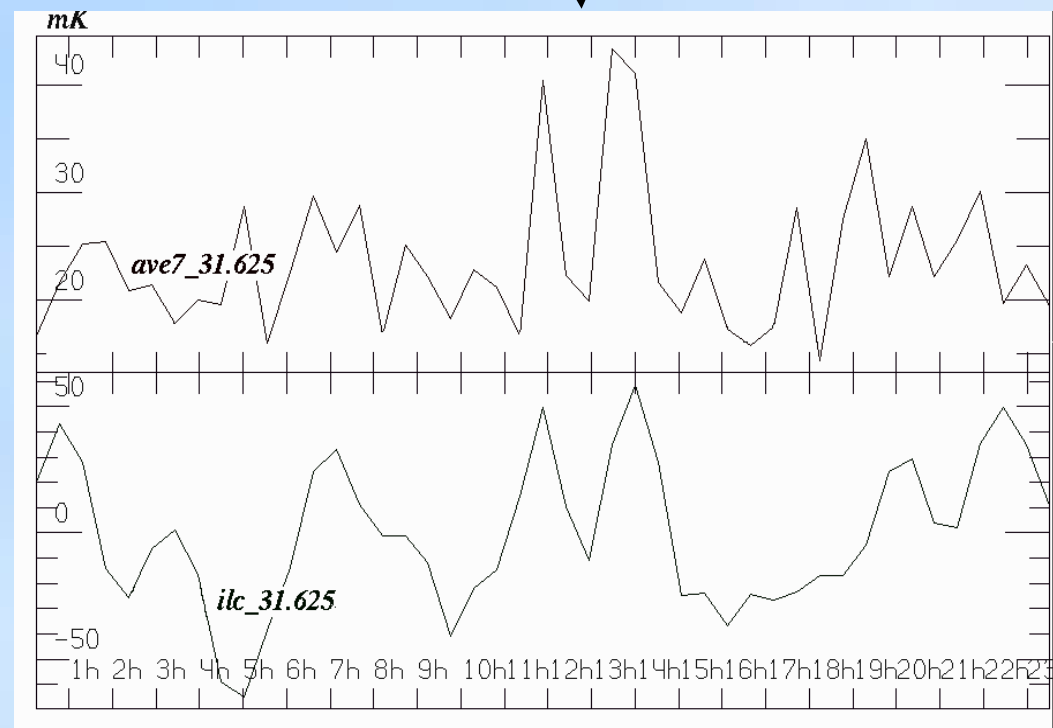
Correlation coefficient values overlaid on the simulated ones using 50 LCDM models and shown with a grey colour

# Examples of 1-dim sections of highest correlation between WMAP CMB data and NVSS data



Scale 3 grad,  
declaration -2.125

Scale 6.75 grad,  
declaration 31.625





# CONCLUSIONS

- 1) We apply the method of searching for correlations in one-dimensional sections of WMAP background-radiation maps. We find, in particular, the WMAP map sections at the declination of  $\delta = 41^\circ$  to contain a signal that is correlated and anticorrelated with the data for the component to be separated.
- 2) The results obtained corroborate the hypothesis about the non-Gaussian structure of the ILC map in one-dimensional scans.
- 3) We demonstrate that the simple and non computer-intensive method of correlation search can be used to qualitatively verify in the one-dimensional case the map of the signal identified.
- 4) Results of search for spots will be demonstrated in forthcoming paper.



**Thank you for attention**



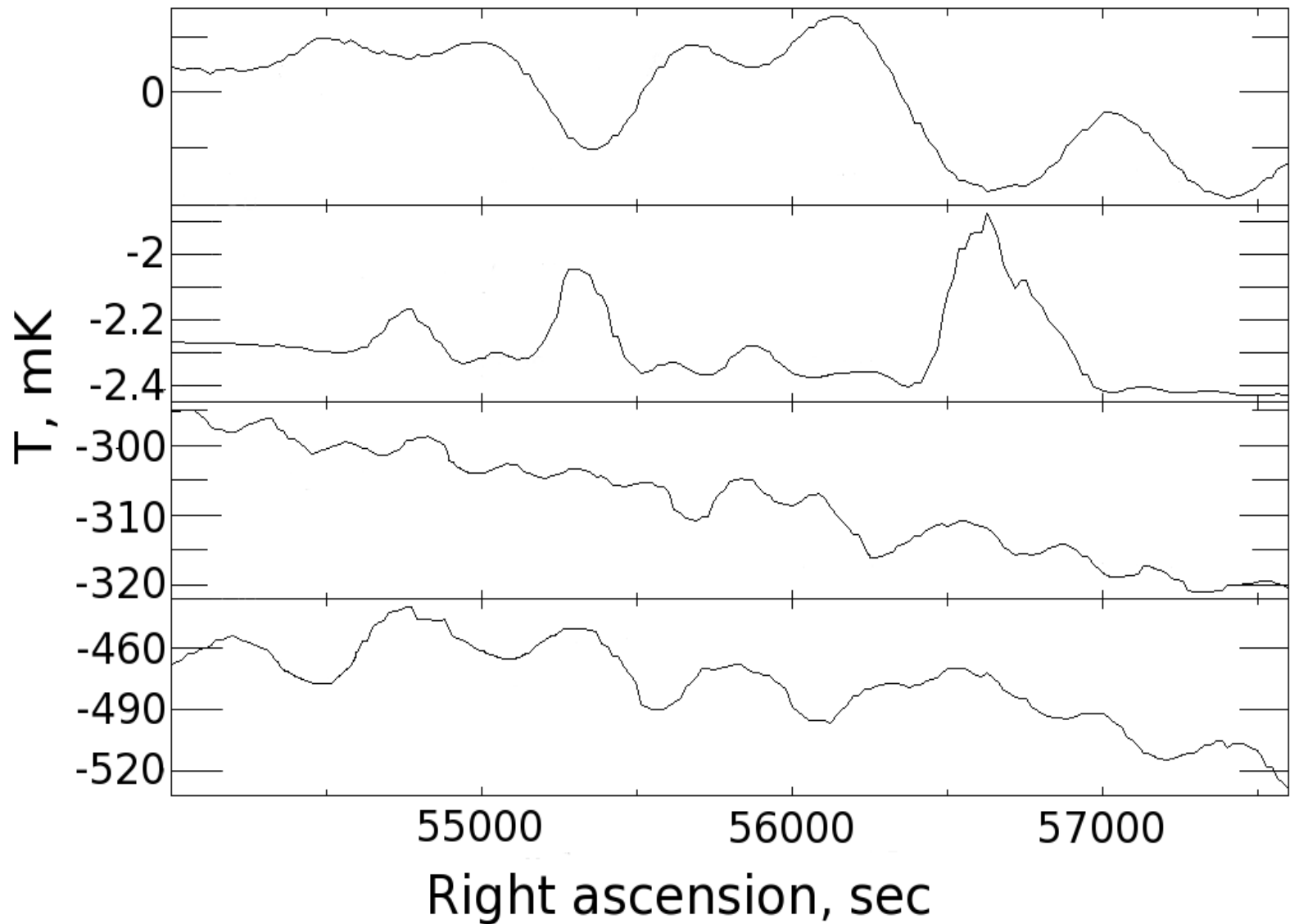
# Section of the domains located outside the Galactic plane

*ILC*

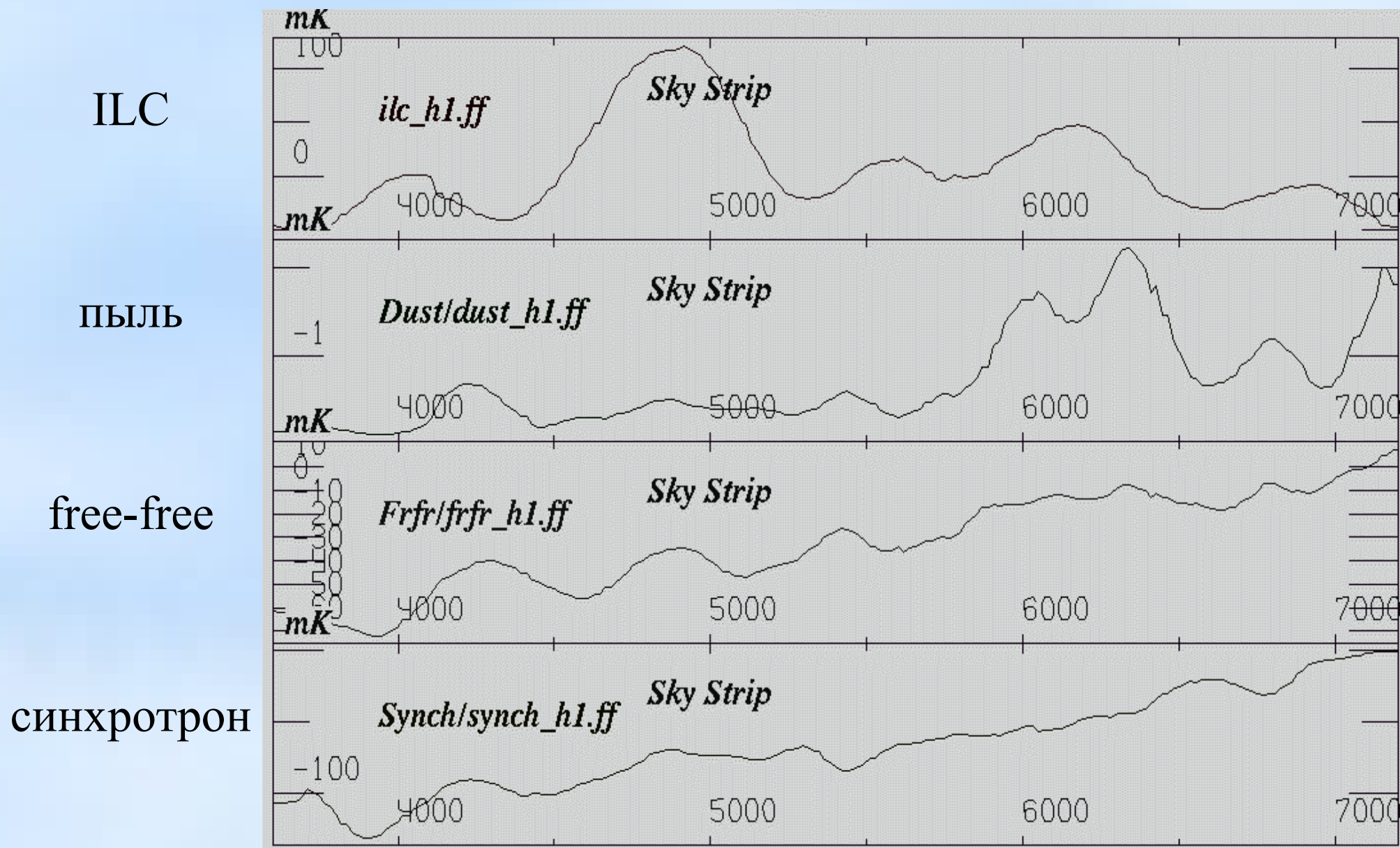
*dust*

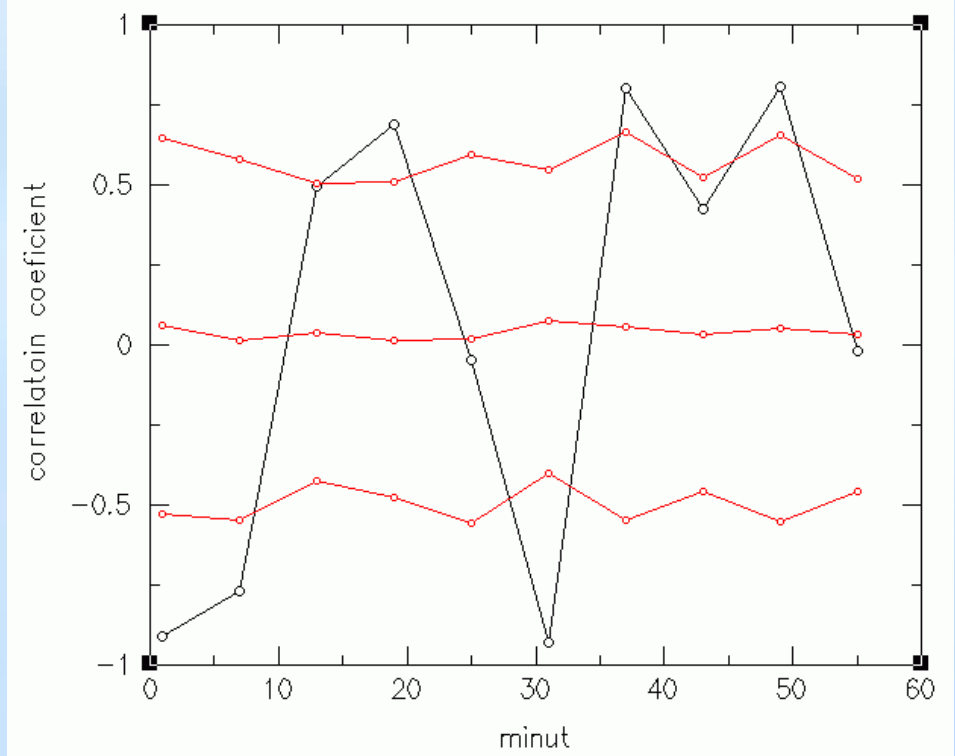
*free-free*

*synchrotron*



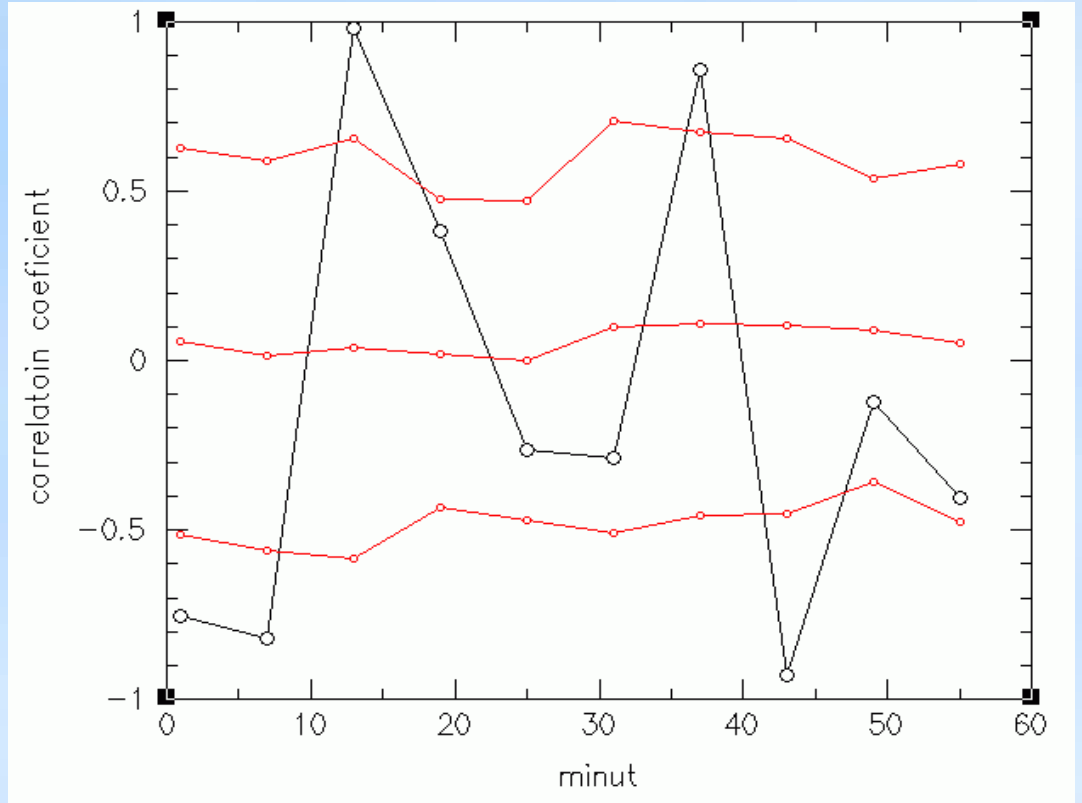
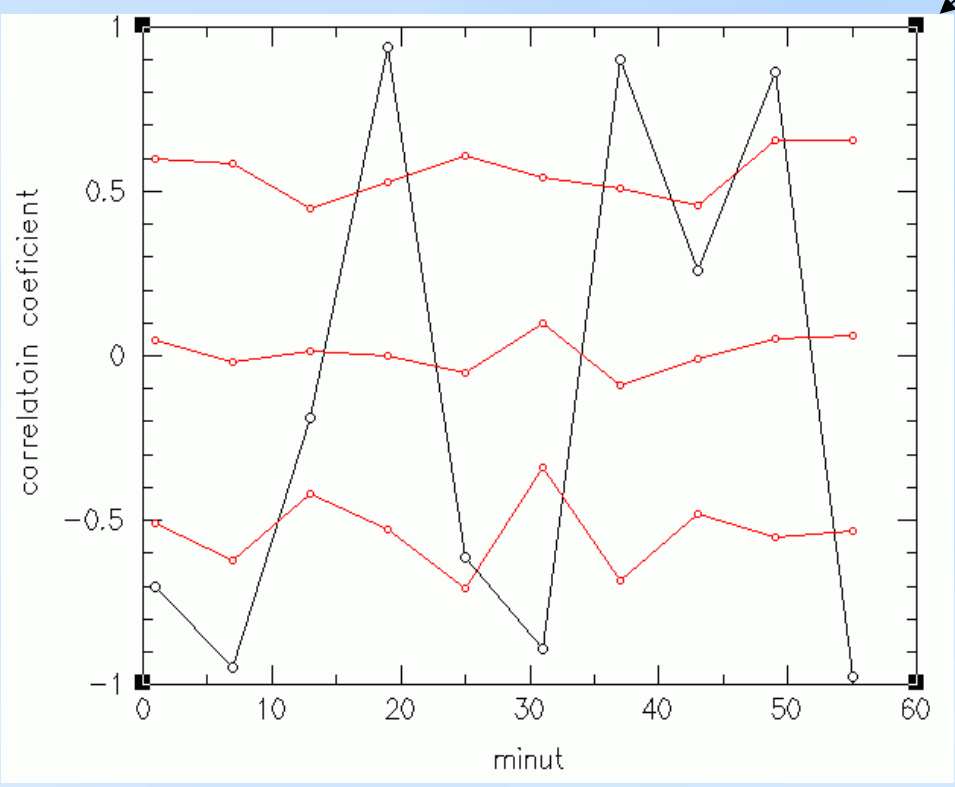
# Best section

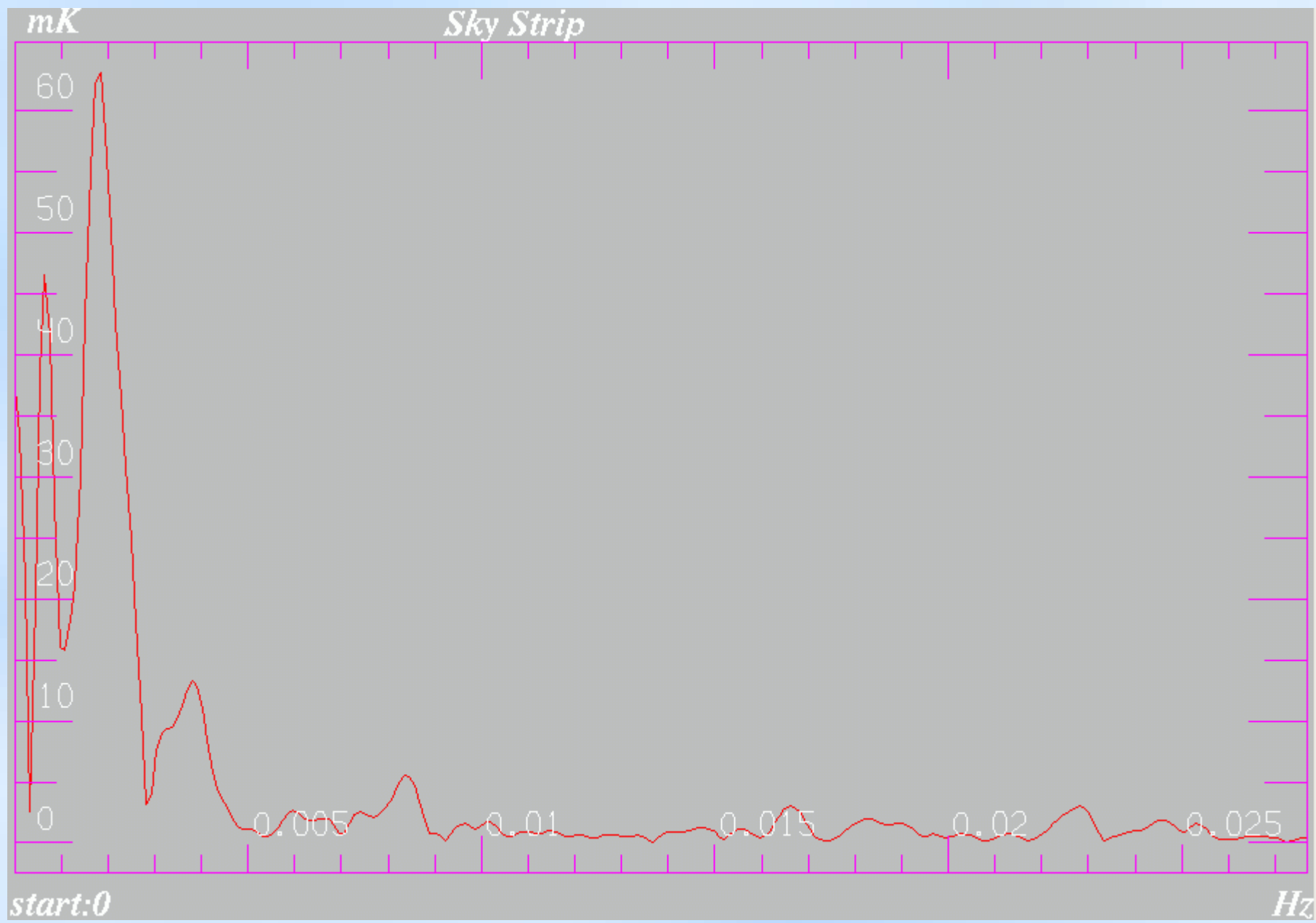




***Корреляционные коэффициенты  
для первого часа:***

***пыль  
free-free  
синхротрон***





# Спектр мощности

