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

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ИССЛЕДОВАНИЕ ОДНОМЕРНЫХ СЕЧЕНИЙ КАРТ WMAP И NVSS

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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, \( \sim 41^\circ \)) on the synchrotron map in Galactic coordinates
The correlation coefficients for synchrotron for 1-hour bins

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

ILC

dust

free-free

synchrotron

Right ascension, sec
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.

Correlation coefficient values overlaid on the simulated ones using 50 LCDM models and shown with a grey colour for scales 0.75 and 6.75 grad.
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 $\theta = 41$ 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
The correlation coefficients for dust for 1-hour bins.

Model of CDM with admissible levels of variation.

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

Model of CDM with admissible levels of a variation

ILC
Section of the domains located outside the Galactic plane

ILC
dust
free-free
synchrotron
Best section

ILC

пыль

tree-free

символ

Synch/synch_h1.ff  Sky Strip

Frfr/frfr_h1.ff  Sky Strip

Dust/dust_h1.ff  Sky Strip
Корреляционные коэффициенты для первого часа:

Пыль
free-free
синхротрон
Спектр мощности