From Russia with love!!!
Multi-frequency Algorithm at Russian Software Package ASL

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VLA Observation Parameters

Test VLA observations (configuration D) of M87 (RA=12:28, Dec=12:40) took place on November 16th, 2005.

- There were 22 antennas enabled.

- Frequency bands: K (K1=21300, K2=22200, K3=23000, K4=23400 MHz) и U (U1=14700, U1=15200 MHz) Total observation time were 3 hours.
Goals of the VLA Experiment

• Multi-frequency synthesis (MFS) of a M87 at the reference frequency (21.3 GHz) with bandwidth of 8.7 GHz by means of a new class of the multi-frequency imaging (MFI) algorithms developed at ASC.

• Multi-frequency analysis (MFA) of M87. Estimation of a spectral index maps of the source on the same reference frequency.

• Comparison of the obtained results with the existing MFI-technologies at NRAO.

• Investigations of the improvement of image fidelity due to MFS.
Tools

• **NRAO** has used *AIPS* software (*one can find the results of the data processing obtained by L. Kogan on the web site* [http://www.aoc.nrao.edu/~lkogan/m87plots.ps](http://www.aoc.nrao.edu/~lkogan/m87plots.ps)

• Astro Space Center (ASC) has used *ASL for Windows* software
MFS Data Processing Steps
(ASL for Windows)

• Maps synthesis by means of self-calibration procedure for all six frequencies (14665, 15135, 21535, 21965, 22935, 23364 MHz).
• Synthesis of the image of M87 on the reference frequency (21535 MHz) by means of generalized linear multi-frequency deconvolution algorithm.
• Spectral analysis of the image (spectral indexes map, spectrum of different parts of the image of M87).
MFS Image of M87.
CLEAN image (left) and spectral index map (right)
M87. Component analysis
Figure 1. Image with poor (u,v)-coverage. 
FIDELITY = 1183.

Figure 2. Model image (27 antennas). 
FIDELITY = 2.461.

Figure 3. Image with MFS. 
FIDELITY = 2.461.