

## Low Frequency VLBI Project

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**Abstract.** An international Low Frequency VLBI Network (LFVN) has been organized for observations at 327 MHz and 1665 MHz frequencies with MARK-II and S2 recording terminals. Data on the interplanetary

medium and spike-like solar bursts were obtained in first preliminary experiments.

A new VLBI project at Low Frequency was started in 1997 as part of the INTAS Project 96-0183 and Indo-Russian Program of Cooperation (ILTP). It has been proposed to telescopes around the world, equipped with Low Frequency receivers and compatible recording systems, to take part to a VLBI Network (LFVN). LFVN is working mainly at 327 MHz and 1665 MHz recording with MARK-II and S2 terminals. The scientific goals of project are :

1. Pre-launch survey for Radioastron Space VLBI mission (AGN observations and scattering researches)
2. Solar studies (spikes, solar corona and wind)
3. Investigations of stars (pulsars, nearest active stars and supernovae remnants).

Eight antennas in Russia, Ukraine, India and Latvia were equipped with MARK-II recording terminal and/or 327 MHz receiver under this project. Currently, the LFVN includes radio telescopes in Russia (Bear Lakes RT-64, Puschino RT-22, St. Pustyn RT-14, Zimenki RT-15, Ussuriysk RT-70), Ukraine (Evpatoria RT-70), India (GMRT and ORT), Italy (Noto RT-32), China (Urumqi RT-25, Shanghai RT-25), Poland (Torun RT-15), Latvia (Ventspils RT-32). The Scientific Advisory Council was created to coordinate LFVN activities and observing programs. Ten different VLBI experiments were organized since 1997. Three experiments have been correlated with JPL/Caltech Block II (USA) or Penticton (Canada). The first results are following :

1. The existence of average-scale structure of solar wind irregularities in the form of "streamfilaments" is suggested. Their directions tally with the direction of the solar wind; the cross dimension of such streams is estimated about 1500-2000 km and their longitudinal scale is no less than 100000 km. The irregularities in the region of the separate "streams" are approximately isotropic.
2. The limits, given by interplanetary medium on the operation of the VLBI-systems at the decimeter wavelength range, are determined. Influence of the solar plasma irregularities is essential for elongation of the sources from the Sun up to 30 deg. (wavelength 18 cm) and up to 80 deg. (wavelength 90 cm). For elongation of the sources from the Sun of less than 3 deg. (18 cm) and of less than 13 deg. (90 cm), the phase coherence is disturbed completely. This must be taken into account in planning VLBI and SVLBI observations of the radio sources in near-solar space.
3. The few spike-like solar microbursts have been detected at 18 cm on shortest baseline 118 km (Bear Lakes - Puschino) with time resolution of 2 sec and maximum of interference amplitude more 3 sigma. The upper limit of angular size (400 mas) and lower limit of brightness temperature (50000 of Sun brightness temperature) were estimated.