

Results of the space mission RadioAstron

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The RadioAstron Space VLBI mission utilizes the 10-m radio telescope on board the dedicated Spektr-R spacecraft to observe cosmic radio sources with an unprecedented angular resolution at 92, 18, 6 and 1.3 cm. The longest baseline of the space-ground interferometer is about 350 000 km. It successfully operates since 2011 together with up to 40 largest ground radio telescopes. Formal resolution as high as 8 and 11 microarcsec has been achieved for mega-masers and quasars observed at 22 GHz, respectively. Successful results have been obtained in all areas of its science program including active galactic nuclei, pulsars and scattering, galactic and extragalactic masers. In particular, the survey of active galactic nuclei has found that cores of quasars are at least one order of magnitude brighter than what was known previously. This has critical physical implications for physics of jet emission in active galaxies. A new scattering effect was discovered from observations of both pulsars and quasars. It allows scientists to estimate parameters of scattering screens as well as provides a new window of opportunity to reconstruct true images of background sources distorted by scattering. We will review the current status of the RadioAstron Space very long baseline interferometer and its main science results.

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