fixed and movable antennas (five-element system in Cambridge/UK, radiotelescopes with North-South or East-West orientable antenna in Parks/AUSTRALIA), and millimetric-wave interferometers (two-antenna interferometer on Hat Creek/CALIFORNIA, two-antenna interferometers in Jet Propulsion Laboratory/CALIFORNIA and on Table Mountain/UNION OF SOUTH AFRICA, two-antenna interferometer in Bordeaux/FRANCE). Figures 9; tables 1; references 39: 6 Russian, 33 Western.
[125-2415]

UDC 523.164:621.396

METRIC-WAVE AND DECIMETRIC-WAVE APERTURE SYNTHESIS SYSTEMS (REVIEW)

Gorkiy IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: RADIOFIZIKA in Russian Vol 26, No 11, Nov 83 pp 1394-1402

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[Abstract] Aperture synthesis systems using metric or decimetric waves are adequate and promising for astrophysical study of extragalactic radioemission sources, operation with metric waves being characterized by destabilizing effects of the ionosphere and thus requiring special methods of data processing. Methods of closure phase and closure amplitude have been proposed and then successfully implemented in very-large-baseline radiotelescopes and multielement interferometers, respectively. Several radiotelescopes have been developed which operate in the supersynthesis mode, with rotation of the earth used for filling the space-frequency plane. Further achievements include the Swarup system (Uti/INDIA) with phase-stable interferometer, the Jodrell Bank system (Manchester/UK), the Palmer MERLIN multielement system (UK) with CLEAN procedure and CORTEL telescope correction algorithm, the VLA system (USA), and the international giant equatorial radiotelescope. Figures 3; references 25: 7 Russian, 18 Western (1 in Russian translation).
[125-2415]

Radiophysics

UDC 520.27+520.874

CROSS-SHAPED APERTURE SYNTHESIS SYSTEM

Gorkiy IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: RADIOFIZIKA in Russian Vol 26, No 11, Nov 83 pp 1403-1419

MC #2216422
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[Abstract] A radiotelescope with a cross-shaped parallel-sequential aperture synthesis system is being installed in Siberia for the purpose of radioheliographic research, particularly for study of solar active regions and bursts. The design of this facility takes into account peculiarities of the sun as a radioemission source, namely its continuous and sometimes fast as well as wide

variation, sudden buildup of new activity, diversity of processes and formations, wavelength dependence of the extent of activity spread, nonuniform large-scale and small-scale structure, and effect of the sun's rotation on location and form of observable objects. In order to cope with solar dynamics, it was foremost necessary to ensure an angle resolution adequate for visible and x-ray images by appropriate spacing of antenna arrays over a large area. With an attainable resolution of 20"x20", it is possible to synthesize 35'x35' radio images of the solar disk with centimetric waves. The entire facility includes an east-west array of 16 antennas, a north-south and east-west Mills-Christiansen cross with 64 antennas in each arm, a tracking system, an automatic channel phasing system, a receiver complex, a generator of reference voltages, a frequency modulator, and all this interfaced to an automation system with peripheral equipment through a communication and data exchange link. The receiver complex consists of an outlying low-noise microwave amplifier in a thermostat, four wideband microwave filters with different center frequencies and a common microwave heterodyne oscillator, a metric-wave attenuator with program control, a multifrequency detector, a reference-frequencies base, and a generator of test noise signal for calibration and inspection. Preliminary and pilot measurements made with this facility have yielded one-dimensional distributions of solar radioluminance and microwave source intensity, buildup and distribution of circular polarization, sudden buildup and transient attenuation of microwave source intensity, and local polarization flicker. Figures 14; references 39: 26 Russian, 13 Western (3 in Russian translation). [125-2415]

UDC 522.2:523.164

DECIMETRIC-WAVE APERTURE SYNTHESIS SYSTEM AT SCIENTIFIC-RESEARCH INSTITUTE OF RADIOPHYSICS

Gorkiy IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: RADIOFIZIKA in Russian Vol 26, No 11, Nov 83 pp 1420-1427

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[Abstract] Development and design of the decimetric-wave aperture synthesis system at the Scientific-Research Institute of Radiophysics began in 1970; its installation was completed and its operation began in 1979. Its main element is a two-antenna (D= 7 m) interferometer with fixed baseline length (417 m) for operation at the 56-cm wavelength in the supersynthesis mode, utilizing the earth's rotation. Its other basic components, developed and produced in various stages of the project, are a receiver complex, a communication link and phase calibration system, and an automatic measuring and data processing system with an "Elektronika D3-28" microcomputer. The receiver complex consists of a hybrid superheterodyne with phase-lock automatic frequency control and two frequency converters, a single-sideband one and a double-sideband one. The first converter consists of high-frequency stages, is followed by a balancing mixer and an intermediate-frequency (60±10 MHz) preamplifier. The second converter is an ampliphase meter. The facility also contains equipment for