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ADDITION TO REPORT OF COMMISSION 40 (see p. 451)

REPORT, BY A. P. MOLCHANOV, OF WORK IN THE FIELD OF RADIO ASTRONOMY
 IN U.S.S.R. IN 1958-1961

Radio-emission from the Sun

Electronic inhomogeneities in the solar corona were discovered at distances up to 30 solar radii, and their characteristics were evaluated (1, 29).

The solar observations at centimetric wave-lengths are consistent with the assumption that the emission from localized sources on the Sun is thermal (the height of the sources is the same as for corona (condensation); the emission is very stable and partially polarized (6, 8-12, 19-22), but leads to the supposition that either high kinetic temperature and strong magnetic fields are present or that the emission from these regions has not only a thermal, but also for example a synchrotron, component (11, 19).

Spectra of the bursts called "pips" were obtained (30). Some peculiarity of the spectra of the bursts on the shorter wave-lengths near $\lambda = 3.04$ cm, can be explained by the influence of the hydrogen line (4). Theoretical investigations are related to the propagation of radio-waves in the plasma and to conditions for the generation of bursts in the solar corona (7).

Radio-emission from the Moon and planets

Measurements were carried out with the large radio telescope with high resolving power (16, 17). Radio-location studies of the Moon ($\lambda = 3$ cm, $\lambda = 10$ cm) give the value of the integral coefficient of reflection (14). The connection between the effective temperature emission from the centre of the Moon and the phase was obtained (31).

The temperature of the radio-emission from Venus was determined as $T \approx 315^\circ \pm 70^\circ$ K (13).

Radio-emission from the galaxy and metagalaxy

Measurements on a wave-length of $\lambda = 21$ cm show some changes of profile in the direction to Cygnus X (27); measurements on $\lambda = 91.7$ cm give negative results (5).

Observations of the emission from the discrete sources have allowed the composition of a catalogue of 40 sources including 24 which had not been observed before (15), the determination of the brightness distribution for some sources (18, 23); a great absorption was found in the western part of the source Omega (23).

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Methods and Instruments used in Radio Astronomy

Methods for carrying the measurement of the polarized component of radio emission (10), the spectra (4), the calibration of radio telescopes (19, 32), the scanning of the antenna beam in radio-astronomical observations (19) and characteristics of antennas with variable profiles (2, 3, 24), were worked out.

The 22-metre radio telescope, with a resolving power of 2 minutes of arc on a wave-length of 0.8 cm, was put into operation (26).

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