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Experience of using WVR at the drifting station "North Pole - 41"

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The scientific equipment of the SP-41 expedition includes a radiometric complex for remote sensing (RMC-2), designed to obtain real-time data on atmospheric humidity parameters - the integral content of water vapor in a column of unit area (g/cm2) and the water content of clouds (kg/m2). The initial data for calculating atmospheric humidity parameters are the results of measuring the power of atmospheric radiation in the microwave band. The measurement results, updated every 10 s, can be used, among other things, to study intra-day variations in the water composition of the atmosphere. The data obtained by RMC-2 are a supplement to the sparse data obtained by aerological sounding. Functionally, the device is a two-channel microwave radiometer measuring the power of the signal emitted by the earth's atmosphere at frequencies f1 = 20.7 GHz and f2 = 31.4 GHz in the zenith direction. Unlike a similar device installed at the research station of the Arctic and Antarctic Research Institute "Ice Base "Mys Baranova", RMC-2 is supplemented with an automatic calibration tool. The device was put into operation on August 25, 2023. The processed measurement results for an interval of 137 days are presented. Based on the work results, an assessment of the performance quality of the device systems was made. During operation, it was revealed that the design of the RMC-2 antenna system drive needed to be modified in order to operate under conditions of increased (up to 50 m/s) wind loads. This drawback was eliminated during the preparation for the SP-42 expedition.