

Possibilities to Monitor Birds Migration through Radar

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The double wave MRL-5 radar station developed in the former USSR for the purpose of studying physical processes in the clouds is used in Israel in ornithology. Calculations and experimental data indicate that the technical characteristics of this radar placed 270 m above the sea level provide detection of large birds of the albatross size flying 700 m high at the distance of at least 100 km, and small birds of the sparrow size flying 100 m high at the distance of at least 40 km. A gray crane flying 3 km high can be detected by means of the radar second channel ($\Delta\theta = 10$ cm) at a distance of almost 200 km. The narrow symmetric diagram of the antenna direction, 0.5° for $\Delta\theta = 3.2$ cm and 1.5° for $\Delta\theta = 10$ cm, enables to obtain more precision in determining the height of both single birds and group flights within the radio location area. The computerized system developed on the basis of MRL-5 and the radio location data specifying characteristics of the signals obtained enable to observe birds migration at any moment of the day. The system provides a possibility to evaluate the evolution of birds migration in space and time, and to provide relevant operative information to the authorities engaged in airplane flights services. The peculiarity of the station and of the system as a whole is its polarimeter appliance enabling to use more precise methods of the target identification. A system developed on the basis of radio location technique, which is used to exert active impact on cloud formation processes, can be successfully used to solve problems related to airplane flights in complex ornithological conditions.