

## 8.14 VERTICAL WIND PROFILE MEASUREMENTS ON THE OPERATIONAL WEATHER RADAR IN “WIND PROFILER” MODE

Yu.B. PAVLYUKOV<sup>1</sup>, A.V. TRAVOV<sup>1</sup>, N.A. EROSHKINA<sup>1</sup>

<sup>1</sup> Central Aerological Observatory, Russia  
yupav@orm.mipt.ru

The report presents the preliminary results of the experiments started in 2017 on the measurement of the vertical wind profile by operational weather radar in a special “wind profiler” (VWP) observation mode.

Radar observations were made in Dolgoprudny Moscow region by DMRL-C, Russian C-band dual-polarization doppler weather radar with pulse compression. 34 DMRL-C radars are in operational use on Russian territory now.

Radar observations in VWP mode are carried out every 10 minutes at a single scanning angle after the end of the routine radar survey. 10- $\mu$ s pulses with step-phase-modulation at PRF 3,3 KHz are used for observations.

A special feature of our VWP measurement method is the use of Discrete Fourier Transformation (DFT) to process Doppler data at each range bin by a special module for digital signal processing based on the NVIDIA CUDA platform with a sampling rate of 10 MHz that provides Doppler radar measurement resolution with 15m on distance and 0.5° on the azimuth.

VAD-method application provides wind speed components calculation with height resolution of 15m \*sin (el), where el is the radar scanning angle. Our experiments were carried out with 30° and 60° elevation angles.

The results of radar observations under different weather conditions were analyzed: from “clear sky” weather to a thunderstorm.

The radar measurements were compared with high-resolution upper-air sounding data of GRUAN 27612 «Dolgoprudny» station, that is located at the same point.

The good agreement of wind data on the speed and direction up to the upper boundary of the radio-echo is revealed.

---