Close Future of Slovak Weather Radar Network

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History of radar meteorology in Slovakia started in 1972. The first radar point was built at Malý Javorník near Bratislava where the Russian radar MRL-2 was placed. Organization guidelines, measurement technique and rainfall intensity estimation were adopted from American references while processing and analyses were accepted from Russian guidelines. In 1974, the meeting of directors of hydrometeorological and meteorological services of socialist countries was held in Bratislava. This assembly granted to Malý Javorník the status of the Regional Centre for Radar Meteorology of the socialist countries.

First Cechoslovak composite information was created in December 1979 and it was distributed to the users through a longwave facsimile transmitters. The primary information was measured manually once per hour at the range 30km and 15km.

In the 80’s both Czech and Slovak radars were replaced by dual wavelength radars MRL-5. These radars were also operated in manual mode.

In 1985, SHMU started to develop a system for automatic processing of radar signal. The construction of a new radar point was started on the hill Košovňová for location of new radar network of Slovakia at the same time.

Both the automatic processing system and the new radar site with MRL-5 were put into operation in 1990.

In the year 1993, when Cechoslovakia was splitted, Slovak weather radar network was established.

In September 1997, new EEC Doppler weather radar was installed at Malý Javorník. The last MRL-5 at Košovňová was replaced by Radaric weather radar with GARSIC signal processor in 2004.

In the late 90’s SHMU specialists started with Slovak radar network extension preparation. Selection of places for 2 new radars covering valleys in Orava and Liptov region and central part of Slovakia has been initiated. Tool for the radar horizon simulation was developed (Kotáškova, D., Kaňák, J. and Strmíka, I., 2000).

Step of search for possible locations of new radar sites:
1. examination of complete territory of Slovakia by simulating radar horizon using digital topography model OTP2000 (result at figure F.4)
2. examination of possible locations from step 1 for the local environment, road accessibility and available infrastructure
3. examination of possible locations from step 2 for the effective composting with existing 2 radars (example of result at figure F.5)

Locations of new radar sites were chosen in 2002-2003 and Slovak radar network will consist of 4 radars:

- Malý Javorník (MJ) - existing radar site, only radar replacing
- Košovňová hoľa (KH) - existing radar site, only radar replacing
- Kubinska hoľa (KH) - new radar site, new 23 m tower
- Špania las (SL) - new radar site, new 40 m tower

In 2012, the call for a project from European funds has been issued for “Flood Warning and Forecasting System” and “Improving technical infrastructure for research and development purposes at SHMU regional offices”, supported from structural funds, SHMU will renovate its IT infrastructure, purchase almost 140 automatic raingage stations, almost 80 automatic weather stations, 20 weather cameras, 4 big and 4 small Doppler current profiler, replace all instruments at 200 m mast and instruments for radiation (direct solar, PAR, short wave, long wave, albedo, \( J \) monitoring).

In remote sensing field, beside new weather radar network, the new reception system for data from geostationary and circumpolar satellites, new LINET based lightning detection system, new aerosol microscupper lidar and ozone brewe spectrophotometer are being installed.

New infrastructure of SHMU will bring new quality and some new amounts of atmosphere observation and will provide new inspiration for research.

References