The Romanian Training and Nowcasting Experience: An Open Laboratory for Capacity Building

Aurora Stan-Sion[1], Daniel Victor Carbunaru, Carolina Oprea

[1]*National Meteorological Administration, 97 Sos. Bucuresti-Ploiesti, Bucharest, Romania, aurora.stan@meteo.inmh.ro*

(May 14, 2007)

I. INTRODUCTION

This presentation shows the history of education and training to improving nowcasting at the National Meteorological Administration in Romania. The story has three phases. The first phase started in 2000 when Romania began to install their first Doppler radars.
The second phase, a transition period, occurred around 2004 when the whole national meteorological network was modernized, upgrading to 8 Doppler radars (5 S-band and 3 C-band).
The third phase, the development period, is still under way, when new regional meteorological conceptual models are being created to offer an end-to-end decision support system to the forecasters.

II. PRESENTATION OF OPERATIONS

Training through the National School of Meteorology was provided at different levels according to necessities: for radar operators, for synopticians and nowcasters, and for managers from Romania and neighboring countries. This last point was especially relevant, as many countries from southeastern Europe, featuring a wide mosaic of nations and specific needs, would benefit from a regional approach based on unified concepts in monitoring severe weather.

Every phase had its specific challenges, like changing the mentalities of forecasters when confronted with data that revealed "new" weather, or the rapid assimilation of knowledge and new technologies that suddenly brought Romania to the lead of severe weather monitoring in Europe.

Consequently, training had to follow the operational needs and impacts, from "first-ever" events like the first tornado damage survey, first tornado forecast, and first flash-flood forecast and observations. In addition, training was tailored to the "actual" needs of the forecasters, combining theory with case studies, but always returning to the specific environment and orography of Romania. Thus, training sessions often become real debates, motivating the forecasters to be personally involved in severe-weather understanding in Romania.

The net result of these training activities was reflected in an increased interest by the forecasters in scientific activity, filling the gaps between forecasting and applied science in severe weather research in Romania.

We will present with this ocasion the most recent steps of our experience: understanding of radar conceptual models and their use and ... missuse in the operational environment

A very important step was the adaptations of the parameters used by the radar algorithms to the Romanian conditions and climatology.

In the same time special studies were devoted to the interaction of some specific radar features, like the well known Three Body Scatering Signature, as shown in Figure 1, produced by hail or large rain drops, with the algorithms that use radial velocities. In operational environment these situations are critical because the process of warning is based, to a certain extend, on the algorithm outputs.

We will present few cases with these situations, all of them being "severe" cases with big hail and strong winds; in these situations the radial velocities were contaminated by negative values, producing false mesoyclones or even false tornado vortex signatures on the radar output. Results of the studies on the discontinuities in reflectivity (Fig. 2) and radial velocitiy will be presented.

Not very often, but very interesting, are the situations where the contamination of the velocity field was by positive values (Fig.3). We will discuss the importance of these data in evaluating the life cycle of the strom using these features of TBSS.

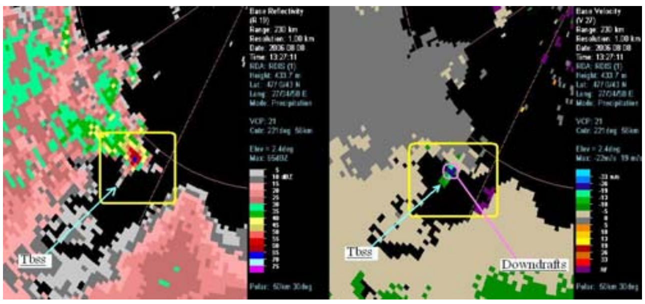

FIG. 1: left panel - reflectivity appearance of TBSS, S-Band radar. right panel, velocity appearance of TBSS, S-band radar

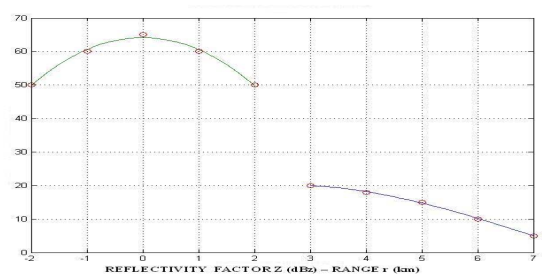

FIG.2: reflectivity discontinuity produced by the TBSS artefact, on the radial along the TBSS axis.

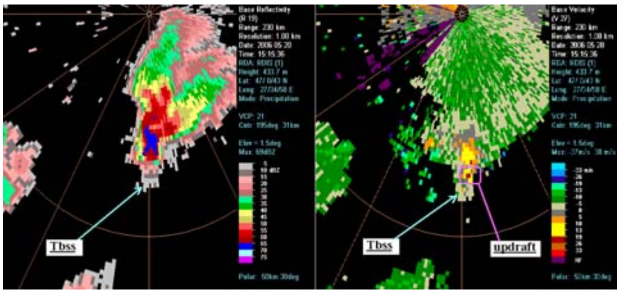

FIG. 3: left panel - reflectivity appearance of TBSS, S-Band radar. right panel, velocity appearance of TBSS, S-band radar

The operational value of the TBSS feature is only one example of the applicative research done in Romania in order to facilitate the understanding of the forecasters of the way the radar "sees" the storms.

Previous topics were: mesocylones in Romania, bow-echoes in Romania, Flash Floods in Romania. All these small experiments helped the forecasters to better understand the specific behaviour of their region of nowcasting.

III. RESULTS AND CONCLUSIONS

The National Meteorological Administration wants to open its facilities in Bucharest to all scientists and forecasters willing to come and share our/their experience in nowcasting capacity building.
Every warm season will have a specific topic, with relevant importance for operational approaches.
The present paper will present the first steps of this experiment, this time about TBSS, describing the quasi-operational environment mirroring the fully-operational one., with the difference that new approaches and techniques are tested to enhance the real-time activity.

Every new approach has its ups and downs, every day in an operational environment is a learning experience that has to be reflected in the training. This presentation will highlight some of the specific approaches for training in nowcasting in Romania, with the aim of encouraging regional cooperation in severe weather monitoring.

IV. AKNOWLEDGMENTS

The authors would like to thanks Haleh Kootval who first inspired and supported the idea of an open nowcasting laboratory in quasi-operational environment for capacity building.