

## Abstract

### Topic of Mc. S. Thesis:

Evaluation of information from Meteosat 8 and the CZRAD network of meteorological radars in selected significant convective situations.

### Abstract:

This paper focused on comparing the information from the satellite Meteosat 8 and the CZRAD network of meteorological radars in selected significant convective situations. The main goals of this study were to assess how satellite and radar data respond on development of convection and if the satellite data responds on intensifying convection before the radar data.

For this purpose, four significant convective situations and associated areas (72 x 72 km) were selected, and the satellite and radar data were preprocessed. Appropriate differences of spectral channels (i.e. satellite methods) and radar products were chosen. The preprocessing involved data synchronization in time and location. The parallax correction was used for satellite data. Seven satellite methods were used – spectral channel IR 10.8 ( $T_{IR10.8}$ ), difference of channels WV 0.6 and IR 10.8 ( $T_{WV0.6} - T_{IR10.8}$ ), IR 13.4 and IR10.8 ( $T_{IR13.4} - T_{IR10.8}$ ), IR 12.0 and IR 10.8 ( $T_{IR12.0} - T_{IR10.8}$ ), IR 8.7 and IR 10.8 ( $T_{IR8.7} - T_{IR10.8}$ ), NIR 1.6 and VIS 0.6 ( $REF_{NIR1.6} - REF_{VIS0.6}$ ) and the trispectral method. The trispectral method resulted from measurements of channels IR 8.7, IR 10.8, IR 12.0. The five radar products used were – maximum column radar reflectivity, radar reflectivity at two kilometres above sea level (CAPPI 2.0), vertically integrated liquid content (VIL), echo-tops (ETOP) and VIL density.

The main result indicates that all examined methods and products responded on development of convection, however the values of some methods and products ( $T_{IR12.0} - T_{IR10.8}$ ,  $REF_{NIR1.6} - REF_{VIS0.6}$  after 16:00 UTC and VIL) could have multiple interpretations. Examined methods and products responded almost simultaneously to the increase in convective activity in most cases. The exception occurred in situations where there was only local convective activity detected in the area of interest. Therefore it was not possible to declare if the initiate state of convection or its intensification was first detected by satellite.

Another finding of this study was that most of the threshold values of satellite characteristics used for assessing the presence of precipitation or their intensity did not fit in selected convective situations. The graphic and tabular parts show the corresponding values of the particular methods and products gained at same time of measurement .

**Key words :** meteorology – satellite – radar – convection