Study about the nowcasting techniques and their implementation in the meteorological radar of Kapildui

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The Directorate of Emergencies and Meteorology (DAEM) has a polarimetric radar located in Kapildui Mountain, near Vitoria-Gasteiz. This equipment is a METEOR 1500 Doppler Weather Radar with Dual polarization capabilities from Gematronik and operating in C-band.

The Faculty of Engineering of Bilbao (University of the Basque Country – UPV/EHU) in collaboration with the DAEM, through de Basque Meteorological Agency Euskalmet, has the opportunity to analyze the database of the radar.

As a result of this relationship was the definition of a collaboration project. The goal was to improve short-term prediction for convective situations, due to geographical location of the Basque Country and its frequency between the months of May and September, in sometimes accompanied by hail and thunderstorms.

First of all, it was decided the CTR (Cell TRacking) products optimization which were done with Rainbow software. Thus by testing our database, we searched for the best parameters values for the improvement of the outcomes.

In addition was developed a tool, which is done in Matlab software, to fulfill slight temporary predictions, complementing the results obtained with Rainbow and helps predicting convective events. This software is based in the matrix data comparative which are obtained successively.

As a result of changes in the parameters of the CTR products, the identification and tracking of convectives cells with high values of reflectivity was improved. Nevertheless worst results arose in the identification of minor cells, that is, cells with small reflectivity values.

Moreover, Matlab development program has allowed tracking some cells which could not be solved by Rainbow suitably, which is a supplement for Rainbow.

In both cases, the identification of cells was restricted by the minimum reflectivity threshold set by user, who can change the value and accuracy of the results.