Images processing techniques applied to the Kapildui weather radar

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The Kapildui weather radar is located on the top of Kapildui's mountain, at the South of the Basque Country. The radar belongs to the Basque Meteorological Agency (Euskalmet), Directorate of Emergencies and Meteorology, Security department of the Basque Government (DAEM). The historical database of this radar is analyzed since 2007 in the department of Applied Mathematics (Faculty of Engineering of Bilbao), in collaboration with Euskalmet and Tecnalia Company.

The objectives of the study were to analyze the spatial variations in a fixed elevation (texture technology) and the temporal variations of two consecutive scans.

Nowadays, the image processing techniques are used in many disciplines. On the one hand, the aim of this paper is the compilation, selection and testing of various weather radar tools based on image processing with the historical database of Kapildui Weather radar. The selection criterion is based on the needs of Euskalmet.

On the other hand, the methodology is complex, many different tools for analysis, but it should be very simple to implement, due to the huge historical database, which contains both heterogeneous situations, meteorological and non meteorological. To verify the results, visual and statistical tools were used.

The results of each tested tools are presented in this paper. Some of the analyzed error sources were: clutter, speckles, attenuation of the radomo and stability of the data during the SPC (single point calibration).

This is an open research line. Therefore, some of these results will be implemented in the short-term future in operative, as a noise filter (based on the technology of texture as a tool for quality) or a tool to control variations in SPC (control systems). However, there are other results that require further studies to fix a meteorological or system application.