Comparison of two calibration methods for constructing climate atlases from Meteosat-5 images

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Several methods have been developed to calibrate Meteosat visible images, the most established of which are the auto-calibration method of Lefevre, et al.,(2005) and Eumetsat radiative transfer method (Govaerts, et al., 2004). In this study, Metosat-5 images for 147 days disseminated through 2001 to 2005, were used to compare these methods. Calibration coefficients of two methods were used for calibrating some selective counts (CN), including 20, 60, 100, 140 and 180, and then statistical parameters were calculated using these calibrated radiances in specified days.

The results showed that the difference between calibrated radiances and hence statistical parameters, RMSE and MBE, increase with the increment of CN. Maximum yearly MBE for the study period was only 13.4 $W.m^{-2}.sr^{-1}.CN^{-1}$ and maximum RMSE was only 12.6 $W.m^{-2}.sr^{-1}.CN^{-1}$ and showed that two methods are in good agreement. Both MBE RMSE values in either methods decreased from positive values in 2001 to negative values in 2005.

The autocalibration method takes into account the short time variations but needs the full coverage images to calculate the required coefficients. On the other hand Eumetsat method does not take into account short time variations but is very simple and requires only the day numbers after launch time to calculate required parameters. Hence, the Eumetsat method is especially advantangous for the calibration of Meteosat images when the full coverage images are not available.